NUREG–1529
Vol. 2

Public Comments on the Proposed 10 CFR Part 51 Rule for Renewal of Nuclear Power Plant Operating Licenses and Supporting Documents: Review of Concerns and NRC Staff Response

Appendices

U.S. Nuclear Regulatory Commission

Office of Nuclear Regulatory Research

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ABSTRACT

This report documents the Nuclear Regulatory Commission (NRC) staff review of public comments provided in response to the NRC's proposed amendments to 10 Code of Federal Regulations (CFR) Part 51, which establish new requirements for the environmental review of applications for the renewal of operating licenses of nuclear power plants. The public comments include those submitted in writing, as well as those provided at public meetings that were held with other Federal agencies, State agencies, nuclear industry representatives, public interest groups, and the general public. This report also contains the NRC staff response to the various concerns raised, and highlights the changes made to the final rule and the supporting documents in response to these concerns.

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LIST OF ACRONYMS

AEA	Atomic Energy Act
ADEQ	Arizona Department of Environmental Quality
AHPP	Arkansas Historic Preservation Program
ALARA	as low as reasonably achievable
APSC	Arizona Public Service Company
ASLB	Atomic Safety and Licensing Board
ASME	American Society of Mechanical Engineers
ATS	altered thermal stratification
BAT	best available technology
BEIR	Biological Effects of Ionizing Radiation
BMP	best management practice
BRC	below regulatory concern
BWR	boiling water reactor
CAA	Clean Air Act
CEC	California Energy Commission
CEQ	Council for Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPI	Containment Performance Improvement
CPM	counts per minute
CRAC	Consequence (of) Reactor Accident Code
CVTR	Carolina Virginia Tube Reactor
CWA	Clean Water Act
D&D	decontamination and decommissioning
DHHS	Department of Health and Human Services
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DSM	demand side management
EA	Environmental Assessment
EI	exposure index
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMF	electromagnetic field
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
EPZ	emergency planning zone
ESA	Endangered Species Act
FCSE	Florida Coalition for Safe Energy
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act

LIST OF ACRONYMS

FR	Federal Register
FONSI	finding of no significant impact
FWS	Fish and Wildlife Service
GAO	General Accounting Office
GBD	gas bubble disease
GE	General Electric
GEIS	Generic Environmental Impact Statement
GSI	generic safety issue
GTCC	greater than Class C
HLW	high-level waste
ICC	Illinois Commerce Commission
ICRP	International Commission on Radiological Protection
INPO	Institute for Nuclear Power Operations
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination of External Events
IPA	integrated plant assessment
IRM	Integrated Resource Management
IRP	integrated resource planning
ISFSI	Independent Spent Fuel Storage Installation
ISI	in-service inspection
ISTM	inspection, surveillance, testing, and maintenance
LCP	least cost planning
LET	linear energy transfer
LLRWPA	Low-Level Radioactive Waste Policy Act
LLW	low-level radioactive waste
LOS	level of service
LPGS	Liquid Pathway Generic Study
LPHC	low probability high consequence
LPZ	low population zone
LWR	light-water reactor
MACCS	MELCOR Accident Consequence Calculation System
MASSPIRG	Massachusetts Public Interest Research Group
MDH	Minnesota Department of Health
MDNR	Maryland Department of Natural Resources
MDPH	Massachusetts Department of Public Health
MDPS	Minnesota Department of Public Service
MDPU	Massachussetts Deprtment of Public Utilities
MOAG	Massachusetts Office of Attorney General
MPCA	Minnesota Pollution Control Agency
MPD	maximum permissible dose
MPIRG	Minnesota Public Interest Research Group
MRS	monitored retrievable storage
MSPO	Maine State Planning Office

LIST OF ACRONYMS

NARUC	National Association of Regulatory Utility Commissioners
NAS	National Academy of Sciences
NCI	National Cancer Institute
NCRP	National Council on Radiation Protection and Measurements
NECNP	New England Coalition on Nuclear Pollution
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NHPA	National Historic Preservation Act
NIH	National Institutes of Health
NIRS	Nuclear Information and Resource Service
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NSP	Northern States Power
NU-END	Neighbors United to End Nuclear Dumps
NUMARC	Nuclear Management and Resources Council
NWPA	Nuclear Waste Policy Act
NYSDEC	New York State Department of Environmental Conservation
NYSEPB	New York State Energy Planning Board
NYSEO	New York State Energy Office
OCRE	Ohio Citizens for Responsible Energy
O&M	operation and maintenance
ORNL	Oak Ridge National Laboratory
PAPUC	Pennsylvania Public Utility Commission
PDER	Pennsylvania Department of Environmental Resources
PI	Prairie Island
PPA	Pollution Prevention Act
PSCW	Public Service Commission of Wisconsin
PRA	probabilistic risk assessment
PWR	pressurized water reactor
RCRA	Resource Conservation and Recovery Act
RD&D	research, development, and demonstration
RET	renewable energy technology
RIA	regulatory impact analysis
RMI	Rocky Mountain Institute
RSS	Reactor Safety Study
ROW	right-of-way
SAMDA	severe accident mitigation design alternative
SEIS	Supplemental Environmental Impact Statement
SERI	Solar Energy Research Institute
SHPO	State Historic Preservation Officer
SNP	Sequoyah Nuclear Plant

LIST OF ACRONYMS

SPDES	State Pollutant Discharge Elimination System
SRPEDD	Southern Regional Planning & Economic Development District
SRP	Standard Review Plan
SSC	systems, structures, and components
TMI	Three Mile Island
TVA	Tennessee Valley Authority
UCS	Union of Concerned Scientists
UEC	United Engineers and Constructors
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USQ	unreviewed safety question
VDPS	Vermont Department of Public Service
VRF	volume reduction factor
WCR	Waste Confidence Rule
WLM	working level months
WPPSS	Washington Public Power Supply System
YAEC	Yankee Atomic Electric Company

INTRODUCTION

This volume contains several appendices. Appendix A contains the list of individuals and organizations providing comments at various stages of the rulemaking process. The names of commenters at the public meetings are listed in the order that they spoke at the meeting; those who submitted written comments are listed by docket number. Appendix B contains the summaries of comments made. Each comment summary is identified by a unique comment number. Appendix C presents the concerns and NRC staff responses. Each concern embodies one or more comments on similar or related issues. The associated comment numbers are referenced for each concern. The concerns are organized by topic areas. A three-letter identifier for the topic, followed by a number, is assigned to each concern. The major topics for orgainizing the concerns and responses are as follows (with the three-letter identifier provided in parentheses):

- Alternatives to License Renewal (ALT)
- Aquatic Ecology (AQE)
- Air Quality (ARQ)
- Decommissioning (DEC)
- Generic Environmental Impact Statement (GIS) (This topic relates to comments about the GEIS, in general, and not to a specific topic covered in the GEIS.)
- Groundwater Quality (GRW)
- Human Health Impact (HHI)
- License Renewal Scenario (LIR)
- Postulated Accidents (POA)
- National Environmental Policy Act (NEP) (This topic relates to comments regarding compliance with NEPA.)
- Need for Generating Capacity (NGC)
- Regulatory Analysis, Regulatory Guide, and Environmental Standard Review Plan (REG)
- Socioeconomics (SOE)
- Solid Waste Management (SWM)
- Surface Water Quality (SWQ)
- Terrestrial Ecology (TEL)

In addition to the above topics, which relate very closely to the issues discussed in the GEIS, several comments were categorized under the following two topics for which no detailed one-to-one response is provided:

- Federal Register Notice (FRN): these are comments concerning requests to extend the original comment period for the proposed rule. No formal response is deemed necessary because the NRC extended the comment period to March 31, 1992.
- No Technical Response Required (NRR): these are comments, which were addressed by the NRC, but for which no additional response has been prepared since it is essentially embodied in the responses to the other comments and the final action taken by the NRC, which is explained in the Statement of Considerations for the final rule.

Finally, Appendix D provides an explanation on how the NRC addressed the detailed comments submitted by NUMARC in Enclosure 3 of its written submission to the initial solicitation on the proposed rule.

APPENDIX A

LISTS OF COMMENTERS

Table A-1. Commenters at the 10 CFR Part 51 Workshop (November 4-5, 1991)

Commenter Name	Organization	Group Name
E. Volpenheim	Dames & Moore	engineering/consulting firm
A. Donnell	ERCE	engineering/consulting firm
J. Fuoto	ERCE	engineering/consulting firm
P. Klotz	Gannett Fleming, Inc.	engineering/consulting firm
R. Broili	Halliburton NUS	engineering/consulting firm
S. Cohen	Sanford Cohen and Associates	engineering/consulting firm
J. Morrow	Sanford Cohen and Associates	engineering/consulting firm
D. Ahern	United Engineers & Constructors	engineering/consulting firm
L. Swartz	Council on Environmental Quality	federal agency
A. Moonka	Sandia National Laboratory	federal agency
R. Eynon	U.S. Department of Energy	federal agency
H. Peterson	U.S. Department of Energy	federal agency
M. Gielecki	U.S. Department of Energy	federal agency
L. Bustard	U.S. Department of Energy (Sandia National Laboratory)	federal agency
E. Whitehead	U.S. Department of the Interior	federal agency
S. Frace	U.S. Environmental Protection Agency	federal agency
J. Russell	U.S. Environmental Protection Agency	federal agency
A. Richardson	U.S. Environmental Protection Agency	federal agency
S. Offerdal	U.S. Environmental Protection Agency	federal agency
T. Marshall	U.S. Environmental Protection Agency	federal agency
R. Bishop	Nuclear Management and Resources Council (NUMARC)	industry committee
D. Walters	NUMARC	industry committee
J. Gallo	Hopkins and Sutter	law/legal firm
M. Axelrad	Newman & Holtinzger	law/legal firm

Table A-1. Commenters at the 10 CFR Part 51 Workshop (November 4-5, 1991)

Commenter Name	Organization	Group Name
J. Silberg	Shaw, Pittman, Potts & Trowbridge	law/legal firm
M. Ross	Winston & Strawn	law/legal firm
K. Houck	Don't Waste U.S.	public interest group
G. Brown	University of Massachusetts Lowell/Committee for a Constructive Tommorrow	public interest group
R. Meyerhoff	Arizona Department of Environmental Quality	state agency
R. Haussler	California Energy Commission	state agency
N. Wilson	California Energy Commission	state agency
M. Bryant	Florida Department of Environmental Regulation	state agency
A. Visnesky	Illinois Commerce Commission	state agency
N. Howey	Illinois Department of Nuclear Safety	state agency
C. Miller	Illinois Department of Nuclear Safety	state agency
S. Brown	Iowa Department of Commerce	state agency
U. Vanags	Maine State Planning Office	state agency
R. McLean	Maryland Department of Natural Resources	state agency
J. Muckerheide	Massachusetts Emergency Management Agency	state agency
R. Callen	Michigan Public Service Commission	state agency
J. Ball	Minnesota Department of Health	state agency
R. Thron	Minnesota Department of Health	state agency
D. Sampsel	Minnesota Department of Public Service	state agency
M. McCarthy	Minnesota Department of Public Service	state agency
A. Kvalseth	Minnesota Department of Public Service	state agency
M. Calaban	New York State Department of Environmental Conservation	state agency
R. Harvey	New York State Department of Environmental Conservation	state agency
E. Gleason	New York State Energy Office	state agency
D. Lee	North Carolina Department of Environment, Health and Natural Resources	state agency

Table A-1. Commenters at the 10 CFR Part 51 Workshop (November 4-5, 1991)

Commenter Name	Organization	Group Name
D. Stewart-Smith	Oregon Department of Energy	state agency
W. Dornsife	Pennsylvania Department of Environmental Resources	state agency
S. Jenkins	Public Service Commission of Wisconsin	state agency
W. Sherman	Vermont Department of Public Service	state agency
T. Harshbarger	American Electric Power Company	utilities
C. Key	Baltimore Gas and Electric	utilities
J. Traverso	Cleveland Electric (Perry Nuclear Plant)	utilities
V. de Pass	Consolidated Edison Company of New York	utilities
B. Brandenburg	Consolidated Edison Company of New York	utilities
R. English	Consumers Power Company	utilities
R. Anderson	Detroit Edison	utilities
P. Stancavage	General Electric Company	utilities
J. Gilchrist	Northern States Power	utilities
M. Layton	Toledo Edison	utilities
J. White	Virginia Power	utilities
P. Littlefield	Yankee Atomic Electric Company	utilities
J. Sutton	Yankee Atomic Electric Company	utilities

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
G. Walker et al.	Individuals	individual	56FR47016
G. Sinner	State of North Dakota, Office of the Governor	state agency	56FR47016
M. Striebel et al.	Franklin County Commissioners	regional/local agency	56FR47016
S. Collins	Do It Yourself Committee	public interest group	56FR47016
M. Dubas	Colorado State Clearinghouse	state agency	56FR47016
M. McCormic	Individual	individual	56FR47016
L. Wise	Ohio State Clearinghouse, Office of Budget and Management	state agency	56FR47016
M. Schloss	Individual	individual	56FR47016
M. Zenick	Deerfield River Compact	regional/local agency	56FR47016
M. Zenick	Deerfield River Compact	regional/local group	56FR47016
L. Pohl	Missouri Federal Assistance Clearinghouse	state agency	56FR47016
R. Sedano	Vermont Department of Public Service	state agency	56FR47016
A. Sokolov	Individual	individual	56FR47016/00001
C. Badger	State of Georgia	state agency	56FR47016/00002
D. Stewart-Smith	Oregon Department of Energy	state agency	56FR47016/00003
T. Adams	Texas	state agency	56FR47016/00004
M. Lewis	Individual	individual	56FR47016/00005
H. Dean	Governor, State of Vermont	state agency	56FR47016/00006
J. Knotts, Jr./Ross	Winston & Strawn	law/legal firm	56FR47016/00007
L. Weaver/T. Allen	Ohio State Clearinghouse/Ohio EPA Division of Groundwater	state agency	56FR47016/00008
S. Brown	Iowa State Utilities Board	state agency	56FR47016/00009
S. Papineau	Nu-End (Neighbors United to End Nuclear Dumps)	public interest group	56FR47016/00010
L. Schmidt/J. Lipoti	New Jersey Department of Environmental Protection and Energy	state agency	56FR47016/00011
R. Bush	Advisory Council on Historic Preservation	federal agency	56FR47016/00012

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
D. Strain et al.	Oklahoma Archeological Survey for OK Department of Commerce	state agency	56FR47016/00013
W. Lattrell	Deerfield River Compact	regional/local agency	56FR47016/00014
W. Lattrell	Deerfield River Compact	regional/local agency	56FR47016/00015
W. Lattrell	Deerfield River Compact	regional/local agency	56FR47016/00016
G. Larson	Midwest Interstate Low-Level Radioactive Waste Commission	regional/local agency	56FR47016/00017
W. Swanson	Arizona Department of Environmental Quality	state agency	56FR47016/00018
W. Murphy	Vermont Yankee Nuclear Power Corporation	utilities	56FR47016/00019
M. Bruner	Individual	individual	56FR47016/00021
K. Storey	Individual	individual	56FR47016/00022
C. Morgan	Individual	individual	56FR47016/00023
B. Cooke	Individual	individual	56FR47016/00024
S. Wodtke	Individual	individual	56FR47016/00025
H. Wodtke	Individual	individual	56FR47016/00026
A. Kushner	Action for a Clean Environment	public interest group	56FR47016/00027
B. Medley et al	Earth Concerns of Oklahoma	public interest group	56FR47016/00028
L. Weaver	Ohio State Clearinghouse, Office of Budget and Management	state agency	56FR47016/00029
J. Kiely	Individual	individual	56FR47016/00030
E. Gleason	New York State Energy Office	state agency	56FR47016/00031
T. Parker	Northern States Power	utilities	56FR47016/00032
C. Meyer	Sierra Club	public interest group	56FR47016/00033
D. Keppel	Individual	individual	56FR47016/00034
W. Dornsife	Pennsylvania Department of Environmental Resources	state agency	56FR47016/00035
A. Powitz	Individual	individual	56FR47016/00036
M. Winnell	Individual	individual	56FR47016/00037

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
R. McLean	Maryland Department of Natural Resources	state agency	56FR47016/00038
J. Harwood	Duke Power Company	utilities	56FR47016/00039
R. Barocsi	Individual	individual	56FR47016/00040
G. Sorensen	Washington Public Power Supply System	utilities	56FR47016/00041
B. Ware	Individual	individual	56FR47016/00042
B. Schroeder	Florida Coalition for Safe Energy	public interest group	56FR47016/00043
D. Saltzman	Individual	individual	56FR47016/00044
S. Plotkin	Individual	individual	56FR47016/00045
M. Plotkin	Individual	individual	56FR47016/00046
E. Fuller	Individual	individual	56FR47016/00047
D. Anderson	Individual	individual	56FR47016/00048
J. Elder	Concerned Citizens for SNEC Safety	public interest group	56FR47016/00049
A. Hirt	Toledo Coalition for Safe Energy	public interest group	56FR47016/00050
A. Kasower	Individual	individual	56FR47016/00051
D. Raskin	Individual	individual	56FR47016/00052
R. Victor	Concerned Citizens of Litchfield and Dutchess Counties	public interest group	56FR47016/00053
A. Kvalseth	Minnesota Department of Public Service (representing several Minnesota agencies)	state agency	56FR47016/00054
D. Edwards	Yankee Atomic Electric Company	utilities	56FR47016/00055
J. Deason	U.S. Department of the Interior	federal agency	56FR47016/00056
C. Schrock	Wisconsin Public Service Corporation	utilities	56FR47016/00057
J. Woodard	Southern Nuclear Operating Company	utilities	56FR47016/00058
A. Berwick	Environmental Protection Division, Office of Attorney General, MA	state agency	56FR47016/00059
H. Humphrey, et al.	Attorneys General, MN, CT, NY, VT, and WI	state agency	56FR47016/00060

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
S. Hiatt	Ohio Citizens for Responsible Energy, Inc.	public interest group	56FR47016/00061
R. Cupit	Minnesota Environmental Quality Board	state agency	56FR47016/00062
W. Rasin	NUMARC	industry committee	56FR47016/00063
R. Pollard	Union of Concerned Scientists	public interest group	56FR47016/00064
S. Weeber	Individual	individual	56FR47016/00065
M. Ferner	Councilman, City of Toledo	regional/local agency	56FR47016/00066
J. Glassman	Individual	individual	56FR47016/00067
D. Raskin	Individual	individual	56FR47016/00068
V. Skorapa, Jr.	Individual	individual	56FR47016/00069
A. Matthews	Individual	individual	56FR47016/00070
W. Conway	Arizona Public Service Company	utilities	56FR47016/00071
F. Segal	Individual	individual	56FR47016/00072
E. Heintraub	Individual	individual	56FR47016/00073
H. Segal	Individual	individual	56FR47016/00074
A. Sprenger	Public Service Commission of Wisconsin	state agency	56FR47016/00075
C. McCoy	Georgia Power Company	utilities	56FR47016/00076
J. Opeka	Northeast Utilities	utilities	56FR47016/00077
J. Silberg	Shaw, Pittman, Potts & Trowbridge	law/legal firm	56FR47016/00078
R. Sedano	State of Vermont	state agency	56FR47016/00079
S. Bram	Consolidated Edison Company of New York	utilities	56FR47016/00080
K. Madison	Don't Waste California	public interest group	56FR47016/00081
Anonymous	Individual - Docket No. 82	individual	56FR47016/00082
S. Smith	Southeastern Regional Planning and Economic Development District	regional/local agency	56FR47016/00083
P. Beard Jr.	Florida Power Corporation .	utilities	56FR47016/00084

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
C. Cebulla	Individual	individual	56FR47016/00085
C. Gauvin	Trout Unlimited	public interest group	56FR47016/00086
R. Sanderson	U.S. Environmental Protection Agency	federal agency	56FR47016/00087
D. Ernst	Cape Cod Commission	regional/local agency	56FR47016/00088
G. Creel	Baltimore Gas and Electric	utilities	56FR47016/00089
E. Savela	Minnesota Public Interest Research Group	public interest group	56FR47016/00090
S. Yarmo	Individual	individual	56FR47016/00091
L. Swartz	Council on Environmental Quality	federal agency	56FR47016/00092
M. Daley	New England Coalition on Nuclear Pollution, Inc.	public interest group	56FR47016/00093
J. Yarmo	Individual	individual	56FR47016/00094
D.and M. Howland	Individual	individual	56FR47016/00095
L. Schmidt	New Jersey Department of Environmental Protection and Energy	state agency	56FR47016/00096
G. Hallsmith	Individual	individual	56FR47016/00097
F. Glassman	Individual	individual	56FR47016/00098
W. Young	U.S. Department of Energy	federal agency	56FR47016/00099
R. Weiss	Individual	individual	56FR47016/00100
W. Gates	Omaha Public Power District	utilities	56FR47016/00101
M. Burzynski	Tennessee Valley Authority	utilities	56FR47016/00102
B. Withers	Wolf Creek Nuclear Operating Corporation	engineering services	56FR47016/00103
V. Volterra	Individual	individual	56FR47016/00104
E. Budin	Individual	individual	56FR47016/00105
W. Lattrell	Deerfield River Compact	regional/local agency	56FR47016/00106
D. Schnell	Union Electric	utilities	56FR47016/00107
P. Grant	Individual	individual	56FR47016/00108

Table A-2. Commenters to Proposed Amendments to 10 CFR Part 51 (September 27, 1991)

Commenter Name	Organization	Group Name	Federal Register/Docket No.
M. Stout	Individual	individual	56FR47016/00109
E. Budin	Individual	individual	56FR47016/00110
W. Langford	Individual	individual	56FR47016/00111
T. Stout	Individual	individual	56FR47016/00112
G. Weigand	Vermont Yankee Nuclear Power Corporation	utilities	56FR47016/00113
C. Buford	Arkansas Historic Preservation Program	state agency	56FR47016/00114
L. Smith	Individual	individual	56FR47016/00115
C. Sorenson	Windham Regional Commission	regional/local agency	56FR47016/00116
G. Larson et al.	Massachusetts Offices of Consumer Affairs & Business Regulation, Environmental Affairs, & Economic Affairs	state agency	56FR47016/00117
W. Nagle Jr.	Massachusetts House of Representatives	state agency	56FR47016/00118
W. Rasin	NUMARC	industry committee	56FR47016/00119
J. Gallo and Ross	Gallo and Ross	law/legal firm	56FR47016/00120
R. Bishop	NUMARC	industry committee	56FR47016/00121
D. Janes	Risk Analysis Corporation	engineering firm	56FR47500/00001
R. Goldberg	Goldberg, Fieldman and Letham for Alabama Municipal Electric Authority	law/legal firm	56FR47500/00002
Anonymous	State of Mississippi	state agency	56FR47500/00003
L. Wise	Ohio State Clearinghouse, Office of Budget and Management	state agency	56FR47500/00004

Table A-3. Commenters at the Rockville, MD Public Meeting (February 9, 1994)

Commenter Name	Organization	Group Name
R. Ng	NUMARC (now the Nuclear Energy Institute)	industry committee
E. Ginsburg	NUMARC	industry committee
C. Gray	National Association of Regulatory Utility Commissioners	industry committee
D. Lewis	Shaw, Pittman, Potts & Trowbridge	law/legal firm
J. Gallo	Gallo and Ross	law/legal firm
H. Fontecilla	Virginia Power	utilities

Table A-4. Commenters at the Rosemont, IL Public Meeting (February 15, 1994)

Commenter Name	Organization	Group Name
R. Ng	NUMARC (now the Nuclear Energy Institute)	industry committee
M. McCarthy	Minnesota Department of Public Service	state agency
A. Visnesky	Illinois Commerce Commission	state agency
D. Kraft	Nuclear Energy Information Service	public interest group
M. Arny	Public Service Commission of Wisconsin	state agency
B. Ross	Citizens Utility Board	public interest group
R. Callen	Michigan Public Service Commission	state agency
S. Jenkins	Public Service Commission of Wisconsin	state agency
D. Hahn	Michigan Department of Public Health	state agency
D. Lewis	Shaw, Pittman, Potts & Trowbridge	law/legal firm
J. Gallo	Gallo and Ross	law/legal firm
E. Ginsberg	NUMARC	industry committee
S. Nerths	Ohio Attorney General's Office	state agency
M. MacMullin	U.S. Environmental Protection Agency	federal agency

Table A-5. Commenters at the Chicopee, MA Public Meeting (February 17, 1994)

Commenter Name	Organization	Group Name
E. Gleason	New York State Energy Office	state agency
W. Sherman	Vermont Department of Public Service	state agency
L. Greer	Massachusetts Office of Attorney General	state agency
G. Brown	Committee for a Constructive Tomorrow	public interest group
R. Ng	NUMARC (now the Nuclear Energy Institute)	industry committee
A. Nogee	Massachusetts Public Interest Research Group	public interest group
J. Oppenheim	Massachusetts Office of Attorney General	state agency
A. Larson	New England Coalition on Nuclear Pollution	public interest group
B. Abbanat	Massachusetts Department of Public Utilities	state agency
E. Ginsburg	NUMARC	industry committee

Table A-6. Non-NRC Participants and Observers at the Public Meeting with NEI and YAEC (May 16, 1994)

Commenter Name	Organization	Group Name
R. Ng	Nuclear Energy Institute (formerly NUMARC)	industry committee
J. Gallo	Gallo and Ross	law/legal firm
J. Grant	Yankee Atomic Electric Company	utilities
E. Ginsberg	Nuclear Energy Institute	industry committee
D. Lewis	Shaw, Pittman, Potts, & Trowbridge	law/legal firm
R. Bishop	Nuclear Energy Institute	industry committee
	OBSERVERS	
R. Mclean	Maryland Department of Natural Resources	state agency
A. Pfeffer	SERCH Licensing/Bechtel	engineering services
C. Gray	National Association of Regulatory Utility Commissioners	association
D. Walters	Nuclear Energy Institute	industry committee
T. Heroux	U.S. Department of Energy	federal agency
C. Pierce	Southern Nuclear/BWRDG	utilities
K. Kalowsky	Winston & Strawn	law/legal firm
D. Staudinger	B&W OG	utilities
B. Borsun	BWNT	
W. Bilanin	Electric Power Research Institute	engineering services
S. Paek	Newman, Bouknight & Edgar	law/legal firm

Table A-7. Commenters to NRC Staff Discussion Paper (59 FR 2542, January 12, 1994)

Commenter Name	Organization	Group Name	Docket No.
Chalfant et al.	State of Minnesota	state agency	001
R.P. Sedano	Vermont Department of Public Service	state agency	002
S.L. Hiatt	Ohio Citizens for Responsible Energy, Inc.	public interest group	003
Parrino et al.	Public Service Commission of Wisconsin Commissioners	state agency	004
D.W. Edwards	Yankee Atomic Electric Company	utilities	005
E.J. Gleason	New York State Energy Office	state agency	006
A.G. Berwick	Environmental Protection Division, Office of Attorney General, MA	state agency	007
B.E. James	Public Service Commission of Wisconsin	state agency	008
Fisher et al.	Ohio Agencies	state agency	009
J.E. Doyle	Attorney General of Wisconsin	state agency	010
D.J. Buckley	Pennsylvania Public Utility Commission	state agency	011
Gordon et al.	Massachusetts Department of Public Utilities	state agency	012
D.W. Edwards	Yankee Atomic Electric Company	utilities	013
A. Nogee	Massachusetts Public Interest Research Group	state agency	014
W.L. Stewart	Virginia Power	utilities	015
F.J. Murray, Jr.	New York State Energy Planning Board	state agency	016
Craig/Visnesky	Illinois Commerce Commission	state agency	017
Edwards/Gallo	Yankee Atomic Electric Company/Gallo and Ross	law/legal firm	018
D.W. Edwards	Yankee Atomic Electric Company	utilities	019
R.W. Bishop	Nuclear Energy Institute (formerly NUMARC)	industry committee	020

Table A-8. Commenters to Proposed Supplement to 10 CFR Part 51 (59 FR 37724, July 25, 1994)

Commenter Name	Organization	Group Name	Docket No.
M.I. Lewis	Individual	individual	001
S.L. Hiatt	Ohio Citizens for Responsible Energy, Inc.	public interest group	002
H. Wodtke	Individual	individual	003
D. Sampsel	State of Minnesota	state agency	004
A.G. Berwick	Environmental Protection Division, Office of Attorney General, MA	state agency	005
C.D. Gray	National Association of Regulatory Utility Commissioners	association	006
D.N. Morey	Southern Nuclear Operating Company	utilities	007
J.P. O'Hanlon	Virginia Power	utilities	008
E.J. Gleason	New York State Energy Office	state agency	009
R.W. Bishop	Nuclear Energy Institute (formerly NUMARC)	industry committee	010
R.E. Sanderson	U.S. Environmental Protection Agency	federal agency	011
Gordon et al.	Massachusetts Department of Public Utilities	state agency	012
S. Franks	U.S. Department of Energy	federal agency	013
J.M. Grant	Yankee Atomic Electric Company	utilities	014
R.E. Denton	Baltimore Gas and Electric Company	utilities	015
D.J. Buckley	Pennsylvania Public Utility Commission	state agency	016
R.F. Phares	Illinois Power	utilities	017
R.P. Sedano	Vermont Department of Public Service	state agency	018
E. Blaug	Council on Environmental Quality	federal agency	019
C.K. McCoy	Georgia Power Company	utilities	020

APPENDIX B

COMMENT SUMMARIES

B-1. Summary of Comments on the Proposed Rule Made at the Public Workshop Held on November 4-5, 1991

Concern: LIR.001 **Comment:** W02.001 **Subtopic:** Refurbishment schedule
Commenter: Sutton **Page:** 23–25; 42–45 **Org:** Yankee Atomic Electric Company

A utility representative was concerned that the bounding scenario for refurbishment activity is unrealistic with respect to both previous maintenance experience and the anticipated approach that a plant would take for license renewal (specifically for Yankee Rowe). He finds it unrealistic to model plant refurbishment activities as one major outage prior to license renewal. The single outage scenario would penalize a utility who decides to do the work in a more prudent manner (i.e., spread out the work over several outages) using the threshold operational cost criteria in Appendix H, Table H-13. The modeling methodology should be to levelize the refurbishment activities to a much greater extent, with the efforts spread out over three or four outages prior to license renewal. Moreover, the commenter does not see why it should be necessary to complete every major refurbishment activity prior to being granted a renewal license. Alternatively, it could be a condition of the renewal license that a particular major refurbishment activity take place in accordance with an agreed upon timetable.

Concern: LIR.002 **Comment:** W02.002 **Subtopic:** Refurbishment cost
Commenter: Bustard **Page:** 31–32 **Org:** U.S. Department of Energy (Sandia National Laboratory)

A Federal agency representative identified a possible inconsistency in the GEIS, where the data in Table 2.7 appears to be based on the more conservative tables in Appendix B, rather than the less conservative tables that are located in the main body of the GEIS. For example, the development of Table 2.7 appears to include the possibility of annealing (as indicated in Appendix B); however, Table 2.6 of the GEIS does not mention this activity.

Concern: LIR.003 **Comment:** W02.003 **Subtopic:** Refurbishment activities
Commenter: Fuoto **Page:** 33 **Org:** ERCE

An engineering services representative would like to know how (cost) estimates were prepared to characterize refurbishment (vessel annealing) or replacement of reactor pressure vessels, particularly for pressurized water reactors (PWRs). (This question seemed to be adequately addressed by the panel. However, it appears that assumptions behind the estimate should also be included in the GEIS, since the subsequent industry response was that the costs associated with a repair in their particular plants will not necessarily be the same.)

Concern: LIR.002 **Comment:** W02.004 **Subtopic:** Refurbishment cost
Commenter: Sutton **Page:** 38–39 **Org:** Yankee Atomic Electric Company

A utility representative was concerned that refurbishment activities identified in the GEIS appear to be based on an over-bounding condition. He cites the fact that the assumptions for the replacement of 30 percent of electrical cable is not reasonable. He based this contention on the recent maintenance rule, where cables were called out as a specific example of something that historically has been shown not to be particularly age dependent.

Concern: LIR.001 **Comment:** W02.005 **Subtopic:** Refurbishment schedule
Commenter: Sutton **Page:** 42–45 **Org:** Yankee Atomic Electric Company

A utility representative was concerned that the cost model and cost numbers dictated by the refurbishment scenario could lead to unreasonable refurbishment cost estimates, which could then get factored into other areas, such as the direct economic cost of refurbishment. These unrealistic estimates may then influence whether it is justifiable to go ahead with relicensing as opposed to other alternatives.

Concern: LIR.001 **Comment:** W02.006 **Subtopic:** Refurbishment schedule
Commenter: Silberg **Page:** 49–50 **Org:** Shaw, Pittman, Potts & Trowbridge

An industry lawyer indicated that the upper-bound approach towards characterizing the refurbishment scenario is a misunderstanding of what the National Environmental Policy Act (NEPA) requires. It has been interpreted by the courts that NEPA is intended to give reasonable estimates of the environmental impacts of particular Federal activities. By consistently using the upper-bound estimates, the GEIS is skewing the estimates towards a situation that no longer represents what is actually happening.

Concern: LIR.001 **Comment:** W02.007 **Subtopic:** Refurbishment schedule
Commenter: Stewart-Smith **Page:** 51 **Org:** Oregon Department of Energy

A State representative agrees with the NRC upper-bound approach. The tremendous amount of uncertainty involved in projecting such things as the condition of the reactor vessel or the condition of steam generators in a PWR for 20 years beyond the current licensing term requires an upper-bound approach. This is particularly important since relicensing decisions could be made 20 years before the current operating license expires.

Concern: LIR.001
Commenter: Sherman

Comment: W02.008
Page: 52

Subtopic: Refurbishment schedule
Org: Vermont Department of Public Service

A State representative concurs that the very nature by which the NRC has chosen to generically resolve the issues requires an upper-bound evaluation. The assumptions in the GEIS revolve around making relicensing decisions as early as 20 years before the initial operating license expires, and the uncertainties during this time period require an upper-bound evaluation.

Concern: SWM.007
Commenter: Sherman

Comment: W02.009
Page: 52–55

Subtopic: LLW disposal-cost/volume
Org: Vermont Department of Public Service

A State representative expressed concern that the total low-level waste (LLW) burden and associated costs, from refurbishment and continued operations, were not reflected in the GEIS. He requested more explanation on information provided in Table B-6, Appendix B such as (1) clarify the meaning of the zero for full power operation in the waste volumes column; (2) clarify where the figure for the total additional waste burden is developed; and (3) indicate the assumed cost per cubic foot of LLW disposal and how this is used in the final numbers for cost comparisons.

Concern: LIR.001
Commenter: Sutton

Comment: W02.010
Page: 61–66

Subtopic: Refurbishment schedule
Org: Yankee Atomic Electric Company

In response to an NRC contractor statement that the refurbishment scenario is not fully bounding in that three or four plants could be expected to fall outside the scenario bounds, a utility representative expressed concern that the bounds are too restrictive. He would prefer to see an easing of the bounds and an associated increase in the number of outlying plants, even if it means that a licensee may have to demonstrate to an intervener that their particular plant is inside the bounds on an issue-by-issue basis. A sensitivity analysis of some of the assumptions inherent in the determination of the bounds would be helpful.

Concern: LIR.001
Commenter: Bustard

Comment: W02.011
Page: 27–30; 65

Subtopic: Refurbishment schedule
Org: U.S. Department of Energy (Sandia National Laboratory)

A Federal agency representative expressed concern that the refurbishment outage assumed in the GEIS, which is a major impact driver, is conservative. Specifically, he compared the 19 inspection, surveillance, testing, and maintenance (ISTM) activities given in Table 2.5 and the 24 replacement and refurbishment activities given in Table 2.6 with those anticipated for the two lead plants (Monticello and Yankee Rowe). For Monticello, 9 of the 19 ISTM activities are being or will be conducted during the current licensing term. Four are expected to be done for license renewal, while 6 are still under study. Of the 24 replacement and refurbishment activities, 4 are being or will be conducted during the current licensing term, 9 are expected to be done for license renewal, and 11 are still under study. Moreover, of the 3 activities unique to boiling water reactors (BWRs), 1 has already been done at Monticello. This is the replacement of recirculation

piping, which has been identified in the GEIS as the driver for the BWR 9-month outage. For Yankee Rowe, 11 of 19 ISTM activities are being or will be conducted during the current licensing term, and 14 of 24 replacement and refurbishment activities are being or will be conducted during the current licensing term.

Concern: GIS.001	**Comment:** W03.001	**Subtopic:** Categorization of issues
Commenter: White	**Page:** 27; 38	**Org:** Virginia Power

An industry representative recommended that all issues in the GEIS be characterized as either Category 1 or Category 2 issues, and therefore the two Category 3 issues should be eliminated. He sees no fundamental difference between Category 2 and Category 3 in terms of how a licensee needs to respond for license renewal.

Concern: TEL.001	**Comment:** W03.002	**Subtopic:** Threatened & endangered species
Commenter: White	**Page:** 26	**Org:** Virginia Power

A utility representative indicated that threatened and endangered species should be a Category 2 issue instead of Category 3. He felt that if there are no verified threatened or endangered species existing on a site or there are no expected impacts to them during refurbishment or operation, then the issue would be insignificant, and no further action would be required. If there are threatened or endangered species within an area, then the issue should be appropriately addressed in the applicant's submittal.

Concern: SWQ.001	**Comment:** W03.003	**Subtopic:** Water use-refurbishment
Commenter: Frace	**Page:** 28	**Org:** U.S. Environmental Protection Agency

A Federal agency representative expressed concern that in many instances, the National Pollutant Discharge Elimination System (NPDES) program is pointed to as a reason for not going into more detail on particular issues pertaining to service water impacts. She believes that while the NPDES permit process should be taking care of water issues, the NRC might still be eliminating an opportunity for the public to raise their concerns on service water issues.

Concern: AQE.001	**Comment:** W03.004	**Subtopic:** Aquatic ecology-refurbishment/Categorization of issues
Commenter: Calaban	**Page:** 30–34	**Org:** New York State Department of Environmental Conservation

A State representative disagreed with the conclusion that nearly all aquatic ecology issues are minor. In particular, he pointed out that the ecological impact of cooling water withdrawal continues to be a major concern, primarily because of high water use. He recommends that the NRC include consideration of current standards of mitigative technology in the GEIS, in that if nuclear plants are to be operating for an additional 20 years, then these license-extended plants

should have their intake and discharge configuration reviewed as if they were a new facility. He indicated that, since many licensed and operating nuclear power plants received their condenser cooling system approval prior to the advent of new technologies (such as combined-cycle cogeneration), the best available technology that is economically achievable may be different given the additional 20 years of plant life. Thus, system retrofits may be appropriate for mitigation of the impacts. As an example, he cited the Indian Point Nuclear Generating Station in New York State as using more than 900 gallons per minute of cooling water per megawatt of electricity produced, in contrast to the 5 to 10 gallons per minute per megawatt proposed for a combined-cycle cogeneration facility of similar power output.

Concern: SWQ.002	**Comment:** W03.005	**Subtopic:** Water use-refurbishment
Commenter: Calaban	**Page:** 30; 33; 35–36	**Org:** New York State Department of Environmental Conservation

A State representative is concerned that the NRC may have overlooked its legal obligation and the obligations of its nuclear plant licensees to comply with Section 401 of the Clean Water Act (CWA). He believes that the NRC cannot issue a license or permit the life extension of any facility until the facility has complied with Section 401 and met State requirements. Consequently, he believes that State certification under Section 401 must be built into the relicensing process, with State participation being an integral part of the license extension activity.

Concern: SWQ.003	**Comment:** W03.006	**Subtopic:** Water use-refurbishment
Commenter: Frace	**Page:** 41–42	**Org:** U.S. Environmental Protection Agency

A Federal agency representative indicated that while a NEPA review is perfomed when a new facility is constructed or when an existing facility has substantial changes made to it, she was concerned that the original NEPA review only considered the duration of the original license and did not go beyond that. She recommended that relicensing be treated as an opportunity for a new NEPA review to account for the extended life because the EPA does not perform a NEPA review on reissuance of an NPDES permit, and the proposed 10 CFR Part 51 revisions are relying on the NPDES permitting process.

Concern: SWQ.001	**Comment:** W03.007	**Subtopic:** Water use-refurbishment
Commenter: Bryant	**Page:** 48–49	**Org:** Florida Department of Environmental Regulation

A State representative indicated that by relying on the NPDES permit process to address surface water issues in the GEIS, the NRC has transferred the burden of a NEPA review to the EPA for the issues related to relicensing. Since relicensing is a major permitting action, the EPA would have to perform an environmental impact statement (EIS) for every plant regarding discharge issues in those States where the EPA still has responsibility for NPDES permits. Additionally, the specific application of NEPA to the NPDES permitting situation may vary among States. As an example, he cited the process in the State of Florida whereby the State has a site certification process similar to NEPA's for new plants and recently constructed facilities, but most of Florida's

nuclear power plants were constructed before the State certification process was in place and would not be brought in under these requirements through a relicensing.

Concern: SWQ.005	**Comment:** W03.008	**Subtopic:** Water use-refurbishment
Commenter: Ahern	**Page:** 50	**Org:** United Engineers & Constructors

An industry representative did not understand why plant relicensing should be linked to the reissuance or the review of the NPDES permit. While the NPDES permit is usually issued for 5-year periods by the State, most States have reopener clauses to relook at the facility, hardware, or operations at almost any point in time. He believes that relicensing at 40 years of operation would not require a relook at the NPDES permit, but rather, the NRC needs only to recognize the status of the site for each plant.

Concern: AQE.002	**Comment:** W03.009	**Subtopic:** Categorization of issues
Commenter: Meyerhoff	**Page:** 51	**Org:** Arizona Department of Environmental Quality

A State representative found it difficult to separate out why some NPDES permit-related issues were designated Category 2, and yet others were designated Category 1. It appears that issues related to aquatic fauna are Category 2, and discharge or water-use conflicts are designated Category 1 even though issues in both areas have to go through the same NPDES permitting process.

Concern: SWQ.004	**Comment:** W03.010	**Subtopic:** Water use conflicts-categorization
Commenter: Meyerhoff	**Page:** 52–53	**Org:** Arizona Department of Environmental Quality

A State representative indicated that water-use conflicts are a serious issue for nuclear power plants in Arizona, and should probably be characterized as a Category 2 issue. He is concerned that while there is a paragraph in the GEIS related to the issue for Arizona and a few additional States with the same problem, if the issue is left as Category 1, the plant that has it as a specific issue gets overlooked.

Concern: NEP.002	**Comment:** W03.011	**Subtopic:** Regulatory responsibility
Commenter: McLean	**Page:** 47; 50–51	**Org:** Maryland Department of Natural Resources

A State representative pointed out that by incorporating regulations that are not within its purview, the NRC must recognize that other regulating authorities will have to exercise additional responsibilities as a result of the NRC's action. The NRC should ensure that such need is recognized through the bounding conditions it establishes, and that other regulating agencies can accommodate this additional burden.

Concern: AQE.003
Commenter: White
Comment: W03.012
Page: 57–58
Subtopic: Heat shock-once-through
Org: Virginia Power

A utility representative suggests the use of the term "thermal discharge effects" instead of "heat shock".

Concern: AQE.004
Commenter: Meyerhoff
Comment: W03.013
Page: 58–59
Subtopic: Aquatic issues-Riparian zones
Org: Arizona Department of Environmental Quality

A State representative would like to see the issue of "riparian zones" addressed in the GEIS even though it may end up as a Category 1 issue. The riparian zone is the vegetation region along a water course that can be affected by water withdrawal, and he believes that its importance to the habitat is worth addressing for nuclear power plants.

Concern: AQE.004
Commenter: Meyerhoff
Comment: W03.014
Page: 59
Subtopic: Aquatic issues-Riparian zones
Org: Arizona Department of Environmental Quality

Due to their role in the food chain, a State representative would like to see aquatic insects included along with fish and shellfish under aquatic ecology in the GEIS.

Concern: SWQ.005
Commenter: Brandenburg
Comment: W03.015
Page: 63–65; 68
Subtopic: Water use-refurbishment
Org: Consolidated Edison Company of New York

A utility representative disagrees with the NRC approach of distinguishing between plants that have pending CWA Section 316(a) or 316(b) issues at the time of the license renewal application and those plants that do not have any pending 316(a) or 316(b) issues. Since the NPDES process imposes a 5-year revisitation of the issues, there will be at least 2 and more likely 3 visitations of these issues by the permitting authority prior to the expiration of the initial license term. It is arbitrary to categorize plants based upon facts as they exist in the 22nd to 25th year of operation, and make inferences as to what will pertain in the 40th year of operation. Additionally, this approach is inconsistent with the methodology that the NRC used in identifying radiological issues for license renewal, wherein the plant is assumed to be in compliance with the NRC's licensing basis at the end of the 40th year, and the issues addressed only reflect the impacts from the 41st year and beyond.

Concern: SWQ.006	**Comment:** W03.016	**Subtopic:** Water use-refurbishment
Commenter: Brandenburg	**Page:** 66–67; 69	**Org:** Consolidated Edison Company of New York

A utility representative indicated that the GEIS discussion of the distinction between the NPDES permit and the CWA Section 316(b) demonstration and determination is obsolete. He indicated that the 316(b) determination is a term that is no longer found in the EPA 40 CFR regulations relating to intake structure criteria since it was rescinded as a result of the court decision in *Appalachian Power vs. Train*, in 1974.

Concern: NONE	**Comment:** W03.017	**Subtopic:** Supportive statement
Commenter: White	**Page:** 25–26	**Org:** Virginia Power

A utility representative strongly supported the NRC's generic approach for evaluating surface water and aquatic ecology issues, and he believes that no relevant or important issues have been left out of consideration.

Concern: NEP.003	**Comment:** W03.018	**Subtopic:** NRC/State review procedure
Commenter: Haussler	**Page:** 61	**Org:** California Energy Commission

A State representative questioned whether NEPA has a provision to designate a lead agency to coordinate the EIS process so that only one document is prepared. He cited the fact that the California Energy Commission had worked with Federal agencies in the preparation of joint environmental documents to meet State and Federal requirements.

Concern: HHI.001	**Comment:** W04.001	**Subtopic:** Radiation exposure-public/worker
Commenter: Thron	**Page:** 22	**Org:** Minnesota Department of Health

A State representative noted that the fact that the plants themselves only contribute 1 percent or less to background radiation is not really relevant to the process. Background radiation is not necessarily entirely safe although most health people and epidemiologists, and others have difficulty in associating cancers with background radiation.

Concern: NONE	**Comment:** W04.002	**Subtopic:** Supportive statement
Commenter: Thron	**Page:** 22–23	**Org:** Minnesota Department of Health

A State representative agreed with the NRC's approach and said that the public is going to demand an upper-bound analysis, particularly for issues dealing with nuclear power plants and public radiation exposure.

Concern: HHI.001	**Comment:** W04.003	**Subtopic:** Radiation exposure-public/worker
Commenter: Thron	**Page:** 23	**Org:** Minnesota Department of Health

A State representative found that the NRC's position on the issue of negligible dose was not clear. He pointed out that in the past the NRC considered 0.1 millirem as essentially negligible. In [Minnesota Department of Health's] risk assessment, a negligible dose of around 0.05 millirem was arrived at and has been applied in the risk assessment of the spent fuel dry cask storage facility. On the issue of negligible dose, he also believes that the health issue cannot be underestimated from the public's viewpoint. The words "nuclear power plant", "radiation", and "public exposure" conjure up all kinds of fears within the public and the NRC has to be extremely careful in light of these fears.

Concern: HHI.002	**Comment:** W04.004	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Thron	**Page:** 23–24	**Org:** Minnesota Department of Health

A State representative noted that public exposure and occupational health standards are going down, and it is conceivable that five, ten years from now they might descend even further. Therefore, we should not be locked in to what is in the GEIS.

Concern: HHI.003	**Comment:** W04.005	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Richardson	**Page:** 24–25	**Org:** U.S. Environmental Protection Agency

A Federal agency representative suggests that the GEIS make clear that the estimate of occupational risk (being less than 1 percent of the natural rate of cancer in workers) is for the average exposure of workers, not the individual maximum exposure.

Concern: HHI.004	**Comment:** W04.006	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Richardson	**Page:** 25	**Org:** U.S. Environmental Protection Agency

A Federal agency representative suggests that the risk estimator of 135 cancer deaths per million person-rem used (on p. 4-105 of the GEIS) be updated because the currently accepted value is more on the order of 500 cancer deaths per million person-rem. The NRC has been using 500 for some time now, particularly in its below regulatory concern (BRC) proceedings.

Concern: HHI.001	**Comment:** W04.007	**Subtopic:** Radiation exposure-public/worker
Commenter: Richardson	**Page:** 25–26	**Org:** U.S. Environmental Protection Agency

A Federal agency representative expressed concern about the basis for considering what is negligible since nothing is really negligible if there is some harm associated with it. He suggests that the cost of reactor operation and the fuel cycle should be measured against the benefits of nuclear power generation—not how the impact compares with natural background radiation.

Concern: HHI.005	**Comment:** W04.008	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Richardson	**Page:** 26	**Org:** U.S. Environmental Protection Agency

A Federal agency representative found inconsistencies in the estimation of the total impact of the fuel cycle over the long term. In the case of radon from uranium mining and milling operations, the impacts for 100 years, 500 years, and 1,000 years were calculated. This was not done for the other long-life materials. Moreover, in the case of the high-level waste (HLW) repository, those calculations are usually carried out for 10,000 years. In his opinion, the appropriate basis for stopping the calculation is when the impact is not there anymore, not some arbitrary choice of a number of years.

Concern: HHI.006	**Comment:** W04.009	**Subtopic:** Occupational exposure
Commenter: Vanags	**Page:** 29–30	**Org:** Maine State Planning Office

A State representative questioned how the practice of as low as is reasonably achievable will be implemented to assure that a power plant utilizes the best radiological control practices given that the public dose due to refurbishment is a Category 1 issue.

Concern: HHI.007	**Comment:** W04.010	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Stewart-Smith	**Page:** 32	**Org:** Oregon Department of Energy

A State representative pointed out that the GEIS needs to have a more upfront treatment of the whole notion of uncertainty in many of these health issues.

Concern: GIS.004	**Comment:** W04.011	**Subtopic:** Plant documentation
Commenter: Stewart-Smith	**Page:** 34–35	**Org:** Oregon Department of Energy

A State representative was concerned that the documentation for plant modifications made over the years may not be complete, and therefore, using plant documentation that exists today as a basis for relicensing may result in skipping over some significant things, e.g., for some plants the procedures for configuration control/management may not be adequate.

Concern: NEP.005 **Comment:** W04.012 **Subtopic:** Public participation/site-specific EISs

Commenter: Stewart-Smith **Page:** 33 **Org:** Oregon Department of Energy

A State representative expressed concern about how Category 1 issues are to be applied on a plant-specific basis. From a public standpoint, this approach appears to foreclose public input to a majority of significant issues on relicensing.

Concern: HHI.008 **Comment:** W04.013 **Subtopic:** Public exposure
Commenter: Domsife **Page:** 35–36 **Org:** Pennsylvania Department of Environmental Resources

A State representative pointed out that public exposure dose should be Category 2 rather than Category 1 because the last EISs are about 50 years old, and land use and population have changed at these facilities over the years. There may be some very different numbers coming out of new assessments of public health and safety. At the very least, utilities should be doing new assessments of the effects of these changes.

Concern: HHI.009 **Comment:** W04.014 **Subtopic:** Occupational exposure
Commenter: Domsife **Page:** 36 **Org:** Pennsylvania Department of Environmental Resources

A State representative noted that the issue of occupational exposure should be upgraded to Category 2 because the configurations of the plants are different and there are enough differences in contamination that the utility should be verifying that, in fact, the analysis bounds the actual dose exposure when refurbishment activities are perfomed.

Concern: HHI.010 **Comment:** W04.015 **Subtopic:** Electromagnetic fields impacts
Commenter: Jenkins **Page:** 37–38 **Org:** Public Service Commission of Wisconsin

A State representative pointed out that there are real problems in designating electromagnetic fields (EMF) as a Category 1 issue because of the pace of the research that is going on and the concerns of the public. Wisconsin is considering legislation that will impose a 3-year moratorium on the construction of new transmission lines.

Concern: HHI.011 **Comment:** W04.016 **Subtopic:** Microbiological organisms
Commenter: English **Page:** 39–40 **Org:** Consumers Power Company

Although he believes that the proposed rule is very good, a utility representative noted that the description in the rule concerning thermophilic organisms in Section 51.53(c)(3)(ii)(H) needs clarification. In that section, the words present in most of the other paragraphs—"due to license renewal"—are not present. Although naeglaria and other concerns were not covered in the initial EISs for most plants, they have been dealt with at many plants. If action has been taken by the

time of the license renewal application, this should be considered and allowed to be considered in the rule for some of the plants that are listed, even though it is a small group of plants. This would make it more consistent with the rest of the rule.

Concern: HHI.012	**Comment:** W04.017	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Anderson	**Page:** 40–41	**Org:** Detroit Edison

A utility representative pointed out that the GEIS projects doses associated with continued operation and with refurbishment activities to remain within the same range as has been experienced in the last decade. He believes this may be a conservative estimate. First, there is the accumulation of experience and lessons learned when tasks are repeated, such as steam generator replacements and recirculation piping replacements. Typically, procedures and technologies are improved; in fact, doses go down over time. In the last five years after implementation of the Three Mile Island modifications, doses have consistently gone down on an average level for workers as well as on a collective level for all workers. Secondly, there is increasing emphasis in the U.S. nuclear industry to follow a trend which has been in place for some time in Europe and Canada to reduce the overall source term in nuclear power plants. If these efforts continue, one should expect that, over time, the level of radiation and amount of radioactivity in the nuclear plants will be reduced, especially in the longer term.

Concern: HHI.001	**Comment:** W04.018	**Subtopic:** Radiation exposure-public/worker
Commenter: Richardson	**Page:** 43	**Org:** U.S. Environmental Protection Agency

A Federal agency representative pointed out that the EPA starts with a value of 10 rems for basic lifetime radiation exposure, and "not just a few millirems." This results in risk estimators that are quite good. (This comment apparently supports the view that background radiation is not negligible.)

Concern: HHI.001	**Comment:** W04.019	**Subtopic:** Radiation exposure-public/worker
Commenter: Thron	**Page:** 44–45	**Org:** Minnesota Department of Health

A State representative remarked that people view a nuclear power plant or a spent fuel storage area as an added involuntary exposure. Thus, there is a need to be honest and forthright in explaining that this radiation is very small, that this incremental amount cannot be measured at the plant boundary because of background radiation, and that in health studies or epidemiological investigations any cause and effect relationship has not been identified.

Concern: POA.008	**Comment:** W04.020	**Subtopic:** Analysis of issues
Commenter: Thron	**Page:** 46	**Org:** Minnesota Department of Health

A State representative said that people are not concerned about the day-to-day operation of a nuclear power facility. They are more concerned about the accidents and whether effective emergency preparedness is in place; hence this aspect of relicensing needs to be examined. Moreover, it seems that States will need to address the emergency preparedness aspects of [in-plant] dry cask storage for spent fuel rods. (While there is no specific concern raised, there might be a need to determine whether the GEIS should address this aspect of emergency preparedness.)

Concern: HHI.001	**Comment:** W04.021	**Subtopic:** Radiation exposure-public/worker
Commenter: Domsife	**Page:** 46	**Org:** Pennsylvania Department of Environmental Resources

A State representative pointed out that the real issue is not that the public objects to comparing radiation exposure from nuclear plants with background radiation. What they object to is the inference that it is acceptable because it is low compared to the background.

Concern: HHI.001	**Comment:** W04.022	**Subtopic:** Radiation exposure-public/worker
Commenter: Stewart-Smith	**Page:** 47–48	**Org:** Oregon Department of Energy

A State representative agreed with a previous comment (W04.021) that using the argument that natural background is somehow acceptable, and therefore anything that is a fraction of natural background must somehow also be acceptable is not going to set well [with the public]. He further suggested that radiation exposure risk from plant operation should be presented as an additional risk to an existing risk (i.e., background radiation).

Concern: HHI.001	**Comment:** W04.023	**Subtopic:** Radiation exposure-public/worker
Commenter: Richardson	**Page:** 49	**Org:** U.S. Environmental Protection Agency

A Federal agency representative noted that saying radiation exposure is a negligible risk compared to background radiation, which is itself not negligible, is counter-productive. What we really should be saying is that the risk of exposure from nuclear power, absent an accident, is very small, and that this risk is less than the risks associated with other means of electrical power generation.

Concern: NEP.005	**Comment:** W04.024	**Subtopic:** Public participation/site-specific EISs
Commenter: Stewart-Smith	**Page:** 58–59; 60–61	**Org:** Oregon Department of Energy

A State representative expressed concern over designating many issues as Category 1 for the following reasons: (1) the public was not a party to that decision; and (2) although there is opportunity for public participation when proceedings take place 10–25 years down the road, the public is shut out because a decision was made previously that the issues were insignificant.

Concern: FRN.001	**Comment:** W04.025	**Subtopic:** Comment period
Commenter: Thron	**Page:** 62; 72	**Org:** Minnesota Department of Health

A State representative noted that the public comment period is too short to get comments from others that are normally outside of the process, yet quite concerned and interested in the issue.

Concern: NEP.009	**Comment:** W04.026	**Subtopic:** Periodic assessments
Commenter: Richardson	**Page:** 63–64	**Org:** U.S. Environmental Protection Agency

A Federal agency representative noted that an implicit assumption in the GEIS is that the conditions do not change. He then raised the question of what would be the conditions under which an issue could be reopened 10, 20, or 30 years from now. He suggested that the GEIS provide some indication of the sensitivity of the results and conclusions to changes in the assumptions.

Concern: NEP.009	**Comment:** W04.027	**Subtopic:** Periodic assessments
Commenter: Stewart-Smith	**Page:** 66–67	**Org:** Oregon Department of Energy

A State representative supported the need for a sensitivity analysis for the following reasons. First, the document will be more robust and may not become irrelevant in the future (i.e., an indefensible document). Second, if some critical piece of the analysis changes significantly due to research or understanding 10 years from now, it might not be difficult for an outside group to say the whole basis of the analysis needs to be redone and get the GEIS thrown out.

Concern: NEP.009	**Comment:** W04.028	**Subtopic:** Periodic assessments
Commenter: Jenkins	**Page:** 67	**Org:** Public Service Commission of Wisconsin

A State representative suggested that an alternative (to a sensitivity analysis or risk assessment) is to do a supplemental GEIS on the parts that have changed.

Concern: HHI.010 **Comment:** W04.029 **Subtopic:** Electromagnetic fields impacts
Commenter: Gallo **Page:** 68 **Org:** Hopkins and Sutter

An industry lawyer pointed out that the NRC has limited jurisdiction on transmission lines, but this does not mean that it should not satisfy its full disclosure obligations. EMF may still be Category 1 because of the jurisdictional problem. The draft document infers that there is some evidence linking harmful effects of EMF, yet none of this evidence is discussed. For purposes of full disclosure, the biological research should be addressed in the GEIS.

Concern: HHI.001 **Comment:** W04.030 **Subtopic:** Radiation exposure-public/worker
Commenter: Gallo **Page:** 69 **Org:** Hopkins and Sutter

An industry lawyer agreed with panel members from the States that an incremental risk (with 10 rem from background radiation as starting point) is a better way to portray the risk of routine releases of radioactivity from power plants.

Concern: GIS.005 **Comment:** W04.031 **Subtopic:** Public meetings
Commenter: Gallo **Page:** 69 **Org:** Hopkins and Sutter

With regard to previous comments from State representatives on public participation, an industry lawyer suggests that the real question that was being asked (see Comments W04.024 and W04.025) was is the rulemaking process created by the NRC reaching enough people. Along this line perhaps it might be useful to convene a meeting like this workshop in other parts of the country to permit greater public participation at various State levels.

Concern: NONE **Comment:** W04.032 **Subtopic:** Supportive statement
Commenter: Gallo **Page:** 69–70 **Org:** Hopkins and Sutter

An industry lawyer believes that the NRC recognized in the GEIS its obligation to update the document from time to time to take into account new information.

Concern: FRN.001 **Comment:** W04.033 **Subtopic:** Comment period
Commenter: McCarthy **Page:** 74 **Org:** Minnesota Department of Public Service

A State representative expressed concern that the comment period is not sufficient to organize several agencies and administrators and respond.

Concern: NEP.001 **Comment:** W04.034 **Subtopic:** Purpose or use of GEIS
Commenter: Callen **Page:** 76 **Org:** Michigan Public Service Commission

A State representative said that foreclosing too many issues at this time (i.e., designating them as Category 1) could result in future litigations.

Concern: SWM.008 **Comment:** W04.035 **Subtopic:** Spent fuel and LLW
Commenter: Sherman **Page:** 79–81 **Org:** Vermont Department of Public Service

A State representative asked whether it was intended that Table S-3 (given in 10 CFR 51.51) be used as the method by which the impact of the disposal of 20 years of additional spent fuel and LLW waste is evaluated, or is the statement on page 4-110 of the GEIS, "No radiological environmental impact is expected from such disposal" meant to be a complete evaluation of the additional waste generated.

Concern: NONE **Comment:** W04.036 **Subtopic:** Categorization of issues
Commenter: Callen **Page:** 75 **Org:** Michigan Public Service Commission

A State representative suggested that in addressing the difference between Category 1 and Category 2, the NRC could focus on mitigation and whether the impact will be mitigated.

Concern: HHI.010 **Comment:** W04.037 **Subtopic:** Electromagnetic fields impacts
Commenter: Callen **Page:** 76 **Org:** Michigan Public Service Commission

A State representative pointed out that in the discussion of EMF, it is insufficient to just say that data is not yet available. Recognizing EMF as a rising public concern and the considerable amount of research going on would justify people's confidence in the NRC.

Concern: NONE **Comment:** W05.001 **Subtopic:** Supportive statement
Commenter: Gilchrist **Page:** 10 **Org:** Northern States Power

A utility representative believes that the socioeconomic issues lend themselves to being covered in the GEIS and that all the [important] issues are covered.

Concern: SOE.001 **Comment:** W05.002 **Subtopic:** Transportation-categorization
Commenter: Gilchrist **Page:** 10–11 **Org:** Northern States Power

A utility representative would like the NRC to consider ranking the transportation issue as a Category 2 issue instead of Category 3. She suggested reviewing whether it could be bounded from past experience since there have been major outages for refurbishment that had no impact on transportation.

Concern: SOE.004 **Comment:** W05.003 **Subtopic:** Local infrastructure
Commenter: Brown **Page:** 11–12; 48 **Org:** Iowa Department of Commerce

A State representative pointed out that the impact of renewal depends on the economic conditions in the surrounding area, which may have changed in the past 5 to 10 years and may change in the future. An assumption implicit in the GEIS, that the local infrastructure will be maintained throughout the renewal term, is questionable given the retrenchment of spending by State and local governments throughout the Midwest and the West Coast. Things that were developed in the 1970s and early 1980s may not be maintained at the same level of economic well-being in the year 2000 as they are today. Therefore, in examining renewal impacts, utilities should consider whether the local infrastructure has been maintained and how future economic conditions might affect housing, transportation, and the availability of other public services.

Concern: SOE.001 **Comment:** W05.004 **Subtopic:** Transportation-categorization
Commenter: Walters **Page:** 13 **Org:** Nuclear Management and Resources Council

An industry representative believes that the transportation issue should be recategorized from Category 3 to Category 2. Tables 3.4 and 3.5 in the GEIS indicate that, in the majority of cases, transportation impacts are insignificant. He believes there are bounding conditions that could be established if the refurbishment work force were looked at in light of other outages and other activities that have historically taken place at the site.

Concern: SOE.001 **Comment:** W05.005 **Subtopic:** Transportation-categorization
Commenter: Muckerheide **Page:** 14 **Org:** Massachusetts Emergency Management Agency

A State representative believes that transportation does not warrant a Category 3 ranking since the conditions experienced at Pilgrim and other plants during an extended outage for major modification activities are consistent with the scope of refurbishment activities assumed in the GEIS.

Concern: SOE.005 **Comment:** W05.006 **Subtopic:** Refurbishment scenario
Commenter: Muckerheide **Page:** 14–15; 46–48 **Org:** Massachusetts Emergency Management Agency

A State representative agrees with the scenario in the sense that the refurbishment activities will be carried out over some substantial period of time, but he is not sure the actual activities will follow the scenario. There are refurbishment activities that are ongoing or will be perfomed in the near term in response to issues, such as maintenance rulemaking issues, which the NRC will pursue with individual licensees. Moreover, the specific refurbishment activity as a major environmental cost is overstated unless there are going to be some major reconstruction type activities—which he doesn't believe will be the case. In addition, the overstated reconstruction activities drive the issues, overstating their impacts. He pointed out that, if the refurbishment scenario were more of a long-term series of outage-type activities that fit within the context of

normal operations, then bounding criteria could be established based on routine major outage activities. Therefore the transportation issue can be made Category 2 based on the bounding consideration of not having reached the level of routine major outage activities. The State representative doesn't believe 1,000 people [as mentioned by the NRC during the discussion] could have a significant impact on transportation and housing. He suggested a review of the numbers.

Concern: SOE.006	**Comment:** W05.007	**Subtopic:** Plant shutdown scenario
Commenter: Muckerheide	**Page:** 15–23	**Org:** Massachusetts Emergency Management Agency

A State representative is concerned that the GEIS didn't explicitly consider a plant shutdown scenario and subsequent uses of local sites. He believes that the NRC predicted the range of socioeconomic impacts on the assumption of continued operations, not shutdown. He made the following points related to this concern. The base case needs to presume that the plant shuts down since this creates a very different socioeconomic picture, and the local consequences must be considered case-by-case. They may be significant based on local considerations such as population density, economic trends, and location relative to populated areas. A plant shutdown in an area with low-population density, in a remote location, and in economic decline is likely to have significant consequences. For example, the shutdown of Yankee Rowe would have a large, significant economic impact on the local community, even though the plant is small, while given the different site-specific conditions at Pilgrim or Seabrook, the impact of their shutdown would be large but not devastating. In addition, it is not realistic to use the GEIS to prejudge, in one Table S-3 equivalent statement in a rule issued in 1992, the future consequences for a locale since the conditions there could be very different by 2010 or so. Moreover, he does not believe that an individual plant's circumstances can be put in the GEIS framework and result in a fair or realistic representation of the issues that need to be considered in the renewal decision. Instead of license renewal, local conditions may warrant the shutting down of a plant and use of the site for something else, and that must be addressed on a case-by-case basis. The NRC should not overstate the ability to disposition as Category 1 the broad range of socioeconomic issues that are not to be addressed in individual applications. On the other hand, it is beneficial to generically resolve as many license renewal issues as possible.

Concern: SOE.001	**Comment:** W05.008	**Subtopic:** Transportation-categorization
Commenter: Traverso	**Page:** 24	**Org:** Cleveland Electric (Perry Nuclear)

A utility representative does not understand why transportation is a Category 3 issue for the following reason. Refurbishment would not be any harder on local transportation systems than major plant outages that have been experienced and have not had a major impact on transportation. Therefore a bounding scenario based on the range of previous outages should be considered.

Concern: SOE.001 **Comment:** W05.009 **Subtopic:** Transportation-categorization
Commenter: Muckerheide **Page:** 26 **Org:** Massachusetts Emergency Management Agency

A State representative requested clarification on the Category 3 ranking for transportation. He asked whether it was the case that the NRC needs site-specific information on the transportation issue at the time of relicensing even though there will be an impact at only a few sites and the impact is expected to be insignificant.

Concern: SOE.002 **Comment:** W05.010 **Subtopic:** Transportation
Commenter: Sutton **Page:** 35 **Org:** Yankee Atomic Electric Company

With regard to the transportation issue, a utility representative requested clarification as to what socioeconomic impacts are considered significant.

Concern: SOE.001 **Comment:** W05.011 **Subtopic:** Transportation-categorization
Commenter: Sutton **Page:** 36–37 **Org:** Yankee Atomic Electric Company

A utility representative believes that the transportation issue could have bounding criteria since the number of workers projected for refurbishment/renewal is lower than original construction and almost by definition the impact of the original construction was acceptable. He wondered whether transportation impacts will tip the balance in the discussion to allow plant construction or license renewal. He believes this issue should be assessed from the point of view of whether this is a crucial issue in the totality of relicensing issues or whether it is something that can be addressed through mitigation.

Concern: SOE.001 **Comment:** W05.012 **Subtopic:** Transportation-categorization
Commenter: Stancavage **Page:** 41; 44 **Org:** General Electric Company

A utility representative believes that transportation should have a Category 2 ranking instead of a Category 3 ranking if bounds that all are comfortable with can be developed, based on operating experience with plant outages. The construction period data used in the NRC analysis probably overestimates the impact on transportation. Data can be gathered over the next couple of months and criteria put together that take advantage of the fact that these plants have been operating for a number of years. They have experienced long outages with significant additions to the workforce without major environmental impacts on transportation. The findings would probably show that the impacts of refurbishment outages on transportation are insignificant.

Concern: SOE.003 **Comment:** W05.013 **Subtopic:** Housing-categorization
Commenter: Stancavage **Page:** 41; 44 **Org:** General Electric Company

A utility representative would like the NRC to consider making housing a Category 1 issue instead of Category 2, or loosening the bounding criteria so that it effectively becomes a Category 1 issue. The construction period data used in the NRC analysis probably overestimates the impact

on housing. Data can be gathered over the next couple of months and criteria put together that take advantage of the fact that these plants have been operating for a number of years. They have experienced long outages with significant addition to the workforce without major environmental impacts in housing. The findings would probably show that the impacts of refurbishment outages on housing are insignificant. If the data shows otherwise, leave it as Category 2.

Concern: NEP.001	**Comment:** W05.014	**Subtopic:** Purpose or use of GEIS
Commenter: Muckerheide	**Page:** 38–41	**Org:** Massachusetts Emergency Management Agency

A State representative commented that the transportation issue is not a go/no-go issue in the renewal analysis. However, NEPA requires consideration of environmental impact issues, such as transportation, that are specifically subject to mitigation. Before the existence of regulations concerning transportation issues, these issues were mitigated with the local community through various permitting processes, etc. Under NEPA, these issues are included in the construction permit and EIS, and specific mitigation actions may be required.

Since the GEIS seems to prejudge issues that are resolvable by mitigation as insignificant, i.e., Category 1, it may not survive the legal system regardless of the merits of the arguments about major outages versus refurbishment. Outages will not be treated as a major Federal action by the legal system; however refurbishment that is part of relicensing will be treated as a major Federal action. If major refurbishment is part of relicensing, site-specific data and required mitigating actions for the transportation issue need to be considered in the GEIS and taken care of as part of the legal process.

Concern: TEL.001	**Comment:** W06.001	**Subtopic:** Threatened & endangered species
Commenter: Harshbarger	**Page:** 9	**Org:** American Electric Power Company

An industry representative recommended changing the threatened and endangered species issue from Category 3 to Category 2. The defined bounds would be whether or not threatened and endangered species are present at a given plant. Known habitat ranges of threatened and endangered species and consultation with appropriate State and Federal wildlife agencies could substantiate the absence of threatened and endangered species relative to plant locations.

Concern: NONE	**Comment:** W06.002	**Subtopic:** Supportive statement
Commenter: Harshbarger	**Page:** 9	**Org:** American Electric Power Company

On behalf of the NUMARC, which represents the nuclear industry, the commenter expressed support for the overall concepts contained in the GEIS. NUMARC appreciates the efforts that have gone into this and associated documents and believes that this approach lends regulatory stability to the license renewal process.

Concern: TEL.007 **Comment:** W06.003 **Subtopic:** Habitat loss and biodiversity
Commenter: Offerdal **Page:** 11; 17 **Org:** U.S. Environmental Protection Agency

A Federal agency representative pointed out that the EPA places high priority on the issue of ecology and terrestrial environment and is in the process of evaluating how to approach habitat loss and biodiversity since they have no direct regulatory authority in these areas except through NEPA and Section 309 of the Clean Air Act (CAA). In addition, the Department of Defense is developing a Congressionally-mandated database in these areas. An aspect of license renewal that may have some impact on biodiversity is the influx of species as a result of cutting power lines.

Concern: TEL.009 **Comment:** W06.004 **Subtopic:** Onsite land use
Commenter: McLean **Page:** 12; 19–20; 21 **Org:** Maryland Department of Natural Resources

A State representative commented that the GEIS does not encompass the impact of onsite spent fuel storage on land use; therefore, the land use issue Category 1 ranking should be reviewed. The NRC should recognize that without a HLW repository or a monitored retrievable storage facility, relicensing will trigger the need for additional onsite storage of spent fuel and the subsequent acquisition of State and local permits for land clearing or wetlands kinds of impacts. The following two specific points should be considered:

1) Additional onsite storage of spent fuel, for example, may fall under "the umbrella of refurbishment", a Category 2 issue, or it may be an onsite land use issue, a Category 1 issue. Additional onsite storage could destroy habitats of threatened and endangered species, a Category 3 issue.

2) The land use issue Category 1 ranking may be inappropriate since it does not set bounds for plants. For instance, the spent fuel facility proposed by Calvert Cliffs is well removed from the power block. It would have greater land use impact than the spent fuel facility at Occonee, which is essentially right in the power block. The GEIS does not require examination of additional onsite storage, e.g., spent fuel, unless a particularly important habitat is present.

Concern: NONE **Comment:** W06.005 **Subtopic:** Supportive statement
Commenter: Broili **Page:** 13 **Org:** Halliburton NUS

An engineering services representative noted that the proposed amendment to 10 CFR Part 51 and the GEIS generally take a comprehensive approach to identifying and analyzing the environmental impacts associated with terrestrial ecology and onsite land use issues. The industry's review of the GEIS did not identify any additional significant issues. Moreover, the identification of potential impacts and their mitigation are not considered particularly burdensome for plant licensees given their extensive operational experience.

Concern: TEL.001	**Comment:** W06.006	**Subtopic:** Threatened & endangered species
Commenter: Broili	**Page:** 14; 25	**Org:** Halliburton NUS

An engineering services representative said that a strong statement to protect threatened and endangered species is appropriate as long as it does not mislead people to thinking every applicant for relicensing will have an adverse impact on threatened and endangered species. This misconception may occur because of the Category 3 ranking. Furthermore, an inconsistency may exist in the GEIS in treating threatened and endangered species as a Category 3 issue for two reasons. First, important plant and animal species are generally associated with habitats that are rare and unlikely to occur at plant sites, as recognized in the GEIS. The exception to this is species that range over larger areas which are therefore generally not dependent on an area as small as a nuclear generating plant. Therefore, if rare or threatened habitats are considered as Category 2, then it follows that threatened and endangered species should be considered as Category 2. Second, when refurbishment activities can be demonstrated to not exceed activities of past major outages at a plant site, refurbishment does not represent a deviation from ongoing plant operations. Consequently, special considerations beyond those in effect for such outages should not be employed. This suggests that a bounding approach based on the potential severity of impacts of proposed actions is appropriate. On the other hand, refurbishment activities may be equivalent to outage activities that are carried out on a continual basis and, in its list of 40 questions, the CEQ defines continuing actions as potential no-actions. In any case, the regulatory process with which the applicant must comply in order to take the right action with regard to threatened species needs clarification.

Concern: TEL.002	**Comment:** W06.007	**Subtopic:** Threatened & endangered species
Commenter: Broili	**Page:** 27	**Org:** Halliburton NUS

As part of clarifying the required process for addressing the threatened and endangered species issue, an engineering services representative requested clarification on a plant's responsibility for a species which might be within its range. Specifically, the NRC should clarify whether a plant is required to report to the U.S. Fish and Wildlife Service (FWS) on this species every 10 years if it had been required by the FWS to prepare a biological assessment stating that the plant's actions will have no adverse impact on a species within the plant's range.

Concern: TEL.006	**Comment:** W06.008	**Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Haussler	**Page:** 29–30; 39	**Org:** California Energy Commission

A State agency representative voiced the need for some proactive activities by the California Energy Commission's environmental program to identify in advance issues for consideration in siting new facilities and in relicensing and refurbishing. Given dwindling land and wildlife resources, California is considering the need to evaluate how existing facilities should be operated in the future. Proactive efforts are needed because literature reviews may not suffice for identifying threatened and endangered species issues, such as bird collisions with transmission lines, due to spotty data and no ongoing monitoring to yield data. Monitoring programs need to

be designed to collect longitudinal data in order to identify impacts for consideration in future relicensing. The NRC could review proactive monitoring efforts to identify impacts and reassess the Category 1 ranking of bird collisions with power lines. In addition, the documentation a facility provides for relicensing needs to consider not only refurbishment, but also continued operations since they would affect the environment as well.

Concern: TEL.003	**Comment:** W06.009	**Subtopic:** Threatened & endangered species
Commenter: Calaban	**Page:** 32	**Org:** New York Department of Environmental Conservation

A State agency representative asked whether the proposed rule considered threatened and endangered species that are listed by an individual State, but not by the Federal government.

Concern: TEL.003	**Comment:** W06.010	**Subtopic:** Threatened & endangered species
Commenter: White	**Page:** 34	**Org:** Virginia Power

A utility representative observed that the GEIS does not consistently mention both State and Federal threatened and endangered species lists.

Concern: TEL.003	**Comment:** W06.011	**Subtopic:** Threatened & endangered species
Commenter: Harshbarger	**Page:** 34	**Org:** American Electric Power Company

A utility representative noted that the draft GEIS does not consistently mention consultation on threatened and endangered species at the State and Federal levels.

Concern: TEL.004	**Comment:** W06.012	**Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Offerdal	**Page:** 38	**Org:** U.S. Environmental Protection Agency

A Federal agency representative asked whether problems, such as bird collisions with cooling towers or power lines across wetlands and major flyways, and mitigative actions, such as illumination of cooling towers or orange aviation balls respectively, would be addressed.

Concern: TEL.005	**Comment:** W06.013	**Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Offerdal	**Page:** 38	**Org:** U.S. Environmental Protection Agency

A Federal agency representative asked whether the data for bird mortality at power lines and cooling towers were derived from all plants or a representative sample of plants.

Concern: TEL.005	**Comment:** W06.014	**Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Whitehead	**Page:** 38	**Org:** U.S. Department of the Interior (U.S. Fish and Wildlife Service)

A Federal agency representative asked which part of the line was considered in gathering data on bird mortality at power lines.

Concern: DEC.001	**Comment:** W07.001	**Subtopic:** Categorization of issues
Commenter: Stewart-Smith	**Page:** 17–19	**Org:** Oregon Department of Energy

A State representative expressed concern that, due to the increased understanding of plate tectonics and the possibility of earthquakes off the Oregon coast, the Trojan nuclear power plant would undergo a significantly different seismic risk analysis than it did when the plant was first licensed in the early 1970s. Consequently, he does not feel that the Category 1 finding for decommissioning is appropriate, since the analysis does not seem to account for the significant plant modifications that Trojan would have to undergo to meet a more restrictive earthquake standard than it does today.

Concern: NEP.008	**Comment:** W07.002	**Subtopic:** NRC/State review procedure
Commenter: Stewart-Smith	**Page:** 20	**Org:** Oregon Department of Energy

A State representative would like to know what constitutes falling outside of the analysis in regard to how licensees are to address Category 1 issues. Specifically, he was concerned that the Category 1 finding across decommissioning was premature since there will be changes resulting from refurbishment which would result in differences from the decommissioning assumptions and it is not clear how these differences are going to be handled.

Concern: NEP.006	**Comment:** W07.003	**Subtopic:** Periodic assessments
Commenter: Silberg	**Page:** 23–24	**Org:** Shaw, Pittman, Potts & Trowbridge

In response to an NRC staff comment during an earlier session that the NRC would be periodically reviewing the assumptions in the GEIS to assess their relevancy, an industry lawyer indicated that it would be worthwhile to specify the mechanism and the frequency of the review process in the GEIS.

Concern: DEC.002 **Comment:** W07.004 **Subtopic:** Nonradiological decommissioning

Commenter: Silberg **Page:** 26–27; 31–32 **Org:** Shaw, Pittman, Potts & Trowbridge

An industry lawyer indicated that the NRC's consideration of only the radiological aspects of decommissioning is inconsistent with what it has done in the past, whereby the NRC required licensees to undertake nonradiological decommissioning actions as well. If this reflects the current NRC practice, he feels that the NRC should clarify the decommissioning requirements that will be imposed.

Concern: DEC.003 **Comment:** W07.005 **Subtopic:** Radiation dose

Commenter: Silberg **Page:** 27 **Org:** Shaw, Pittman, Potts & Trowbridge

An industry lawyer indicated that the decommissioning of the Pathfinder reactor in South Dakota is well underway, with very minor environmental impacts and with very low radiological occupational exposure. He feels that the NRC ought to incorporate some of these data into Table 7.1 of the GEIS.

Concern: DEC.004 **Comment:** W07.006 **Subtopic:** Waste management

Commenter: Domsife **Page:** 33 **Org:** Pennsylvania Department of Environmental Resources

A State representative indicated that the variability in the estimates of the current LLW compact cost per cubic foot are probably not in line with the GEIS assumptions. He recommended that the GEIS analysis on LLW disposal costs be expanded to reflect the wide range of cost variability from one compact to another.

Concern: DEC.002 **Comment:** W07.007 **Subtopic:** Nonradiological decommissioning

Commenter: Wilson **Page:** 34–36; 38–39 **Org:** Califomia Energy Commission

A State representative took exception to the NRC's position, as stated in the GEIS, that non-radiological decommissioning involves only site stabilization and does not mean the return of a site to preconstruction conditions. Since most nuclear power plants received their permits before NEPA and State environmental laws were passed, he feels that the public is going to want to use license renewal as an opportunity to relook at the whole power plant, with final decommissioning to include the return of the site to preconstruction conditions.

Concern: DEC.005 **Comment:** W07.008 **Subtopic:** Waste management

Commenter: Vanags **Page:** 39–44 **Org:** Maine State Planning Office

A State representative expressed concern that the issue of plant-specific license renewal should not be addressed without first going to the individual States who are responsible for the management of LLW to make sure that the waste from decommissioning can be adequately dealt with in that

particular time period. Specifically, Maine is actively pursuing a contract with another State for LLW disposal, but it may only be valid for a 30-year period. If Maine Yankee were to pursue another 20 years of operation, there may not be a valid contract in place during the eventual decommissioning period to handle the LLW generated.

Concern: DEC.001	**Comment:** W07.009	**Subtopic:** Categorization of issues
Commenter: Vanags	**Page:** 41	**Org:** Maine State Planning Office

A State representative expressed concern with the determination that waste disposal can be characterized as Category 1. Specifically, this is inappropriate for the State of Maine because the issue of waste disposal is of such tremendous concern to the residents of Maine.

Concern: NONE	**Comment:** W07.010	**Subtopic:** Supportive statement
Commenter: Domsife	**Page:** 44	**Org:** Pennsylvania Department of Environmental Resources

A State representative supported the NRC position that the availability of radioactive waste disposal is not really an issue that the GEIS should be addressing. He feels that the GEIS should be looking at the impacts, not the political decisions that need to take place to have waste disposal available.

Concern: DEC.004	**Comment:** W07.011	**Subtopic:** Waste management
Commenter: Miller	**Page:** 47	**Org:** Illinois Department of Nuclear Safety

A State representative indicated that if a utility chooses plant life extension, there may be some resultant economic impacts apparently not considered in the GEIS analysis regarding either the expansion of existing waste disposal facilities or the siting of another facility.

Concern: DEC.004	**Comment:** W07.012	**Subtopic:** Waste management
Commenter: Domsife	**Page:** 48–50	**Org:** Pennsylvania Department of Environmental Resources

A State representative expressed skepticism over the numbers used in the LLW analysis for decommissioning. Specifically, the LLW volume numbers that occur from 30 to 50 years of safe storage suddenly drop by a factor of ten. He believes that this drop may reflect an assumption of a BRC policy being implemented, which may not be in place in that timeframe. He feels that the NRC needs to relook at the LLW volumes based on the possibility that there will not be a BRC policy in place. Additionally, the assumption that the amount of Class C or greater than Class C waste being generated will not increase as a result of an additional 20 years of irradiation seems unfounded. On a more general basis, the commenter believes that the GEIS should provide more depth in terms of the derivation of the numbers used in the analysis, and take into consideration the variability expected from utility to utility.

Concern: DEC.004
Commenter: Domsife

Comment: W07.013
Page: 51–52

Subtopic: Waste management
Org: Pennsylvania Department of Environmental Resources

A State representative indicated that the waste volume numbers assumed in the GEIS seem to reflect very little in terms of volume reduction and do not take into account the advanced decontamination processes that are currently in use due to the high cost of waste disposal.

Concern: DEC.006
Commenter: Russell

Comment: W07.014
Page: 54

Subtopic: Documentation
Org: U.S. Environmental Protection Agency

A Federal agency representative expressed difficulty in understanding the organizational approach to the decommissioning section of the GEIS with respect to the rest of the document. Individual aspects of the refurbishment scenario (such as waste management or cost impacts) are addressed in separate chapters of the document, however for decommissioning, all associated topics are discussed in the one chapter. He recommended that the approach for this section be explained better in the beginning of the chapter to aid the reader.

Concern: DEC.001
Commenter: Cohen

Comment: W07.015
Page: 56

Subtopic: Categorization of issues
Org: Sanford Cohen and Associates

A consulting firm representative questioned whether it was a contradiction that the LLW disposal issue was treated as Category 1 in the decommissioning section, but was treated as Category 2 in the solid waste management section.

Concern: DEC.004
Commenter: Miller

Comment: W07.016
Page: 57

Subtopic: Waste management
Org: Illinois Department of Nuclear Safety

A State representative recommended that the decommissioning analysis consider the impacts of having to place a facility in a SAFSTOR condition for longer periods than originally planned in response to [the likelihood of] limited availability of waste disposal facilities at the time of decommissioning.

Concern: NEP.008
Commenter: Russell

Comment: W07.017
Page: 52

Subtopic: NRC/State review procedure
Org: U.S. Environmental Protection Agency

A Federal agency representative would like clarification of the procedures followed if the impact from decommissioning falls outside certain bounds, i.e., whether an EIS is automatically triggered.

Concern: NGC.001	**Comment:** W08.001	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: McCarthy	**Page:** 11–12; 13–14	**Org:** Minnesota Department of Public Service

A State representative suggested that the price of additional power, which is an underlying but unstated assumption in the analysis of the need for electrical generating capacity, should be addressed. He also disagreed with what he believes to be the NRC's assumption that "nuclear will always be the first economically dispatched resource . . ." since there are other cost-related assumptions which affect the economic decision (e.g., nuclear waste disposal costs).

Concern: NGC.004	**Comment:** W08.002	**Subtopic:** State participation
Commenter: McCarthy	**Page:** 12–13	**Org:** Minnesota Department of Public Service

A State representative disagreed with the NRC's assumption that the need for electrical generation is gradual and predictable. Specifically, he noted that Volume 1 of the GEIS (p. 86, lines 12–14) assumes that [electricity use] increases the energy market share because it enjoys more stable energy prices than other energy forms. This assumption ignores the move towards deregulation and substantial industry restructuring.

Concern: NGC.001	**Comment:** W08.003	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Visnesky	**Page:** 15	**Org:** Illinois Commerce Commission

A State representative agreed with a previous comment made (W08.001) that the question of what should be the price of this electrical generation to be competitive should be addressed.

Concern: NONE	**Comment:** W08.004	**Subtopic:** Supportive statement
Commenter: Visnesky	**Page:** 16	**Org:** Illinois Commerce Commission

A State representative from Illinois noted that his State's requirement on least cost planning is consistent with the NRC's approach. Illinois requires utilities to show that the capacity which they might otherwise retire would not be economically recoverable as the lowest cost capacity.

Concern: NGC.004	**Comment:** W08.005	**Subtopic:** State participation
Commenter: Callen	**Page:** 16	**Org:** Michigan Public Service Commission

A State representative agreed with a previous comment made (W08.002) concerning "the uncertain and changing nature of the business . . . ."

Concern: NGC.004 **Comment:** W08.006 **Subtopic:** State participation
Commenter: Callen **Page:** 16–18 **Org:** Michigan Public Service Commission

A State representative observed that the GEIS does not look like the kind of long-range planning documents produced by the States that look 15 to 20 years ahead. Specifically, he mentioned that in a long-range planning document one would see essentially a mixture of alternatives—all potential alternatives presented as well as the "expected planning alternative" proposed by the utility—not the one-to-one comparison made in the GEIS. Moreover, with regard to conservation one would see considerable argument over penetration (just how much of the public you can convince), or what the penetration will be for a particular load management alternative. In addition, he pointed out that demand forecasts vary enormously across the country and have a very substantial impact on future expectations. Therefore, differences in long-range planning vary among States.

Concern: NGC.003 **Comment:** W08.007 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Callen **Page:** 19 **Org:** Michigan Public Service Commission

A State representative brought up the subject of greenhouse effects that potentially could benefit nuclear power. In this regard, he mentioned that the State of Michigan is cooperating with the EPA on a document on the potential impact of the greenhouse effect on Michigan's electric generation. It might be useful for the NRC to examine this document because it includes nuclear license extension and new plants, and the potential for these plants to provide electricity on an economically competitive basis.

Concern: NGC.004 **Comment:** W08.008 **Subtopic:** State participation
Commenter: Gleason **Page:** 19–20 **Org:** New York State Energy Office

A State representative pointed out that determination of need, like most nonradiological health and safety issues are State, not Federal, responsibilities. She believes that the NRC's approach is to declare the issue generic and therefore just avoid the problem. She suggests another approach, whereby the States and the NRC jointly fashion a mechanism or a procedure to recognize State determinations of need in the license renewal process. This would avoid the type of litigation that has occurred over the last 15 to 20 years.

Concern: NGC.004 **Comment:** W08.009 **Subtopic:** State participation
Commenter: Gleason **Page:** 20 **Org:** New York State Energy Office

A State representative, voicing a similar concern raised by others, said that analyses of need become quickly dated, particularly in electrical generation. She did not believe that an analysis of need conducted in 1990 or 1991 would still apply in the year 2007 [which is the year when the first commercial nuclear power plant license expires in New York].

Concern: NGC.005	**Comment:** W08.010	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Gleason	**Page:** 21–22	**Org:** New York State Energy Office

A State representative noted that it was very difficult to replicate or verify the analyses that were done in Section 8 of the GEIS, particularly those assumptions that are regionally specific. For example, it is difficult to determine whether the analysis considered the operation of Niagara Falls in the "year 2028 or 2020 . . . ." More information on the assumptions that underlie the determination are needed.

Concern: NONE	**Comment:** W08.011	**Subtopic:** Supportive statement
Commenter: Stancavage	**Page:** 21	**Org:** General Electric Company

A utility representative said that the NRC did not leave out any issues.

Concern: NGC.005	**Comment:** W08.012	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Stancavage	**Page:** 22–23	**Org:** General Electric Company

While agreeing that license renewal is needed to maintain generating capacity and to meet additional demand, a utility representative suggested strengthening the GEIS in the following areas: (1) provide basis for regional [forecasting] analysis versus analysis based on a local or State area; and (2) provide additional technical information on [demand] projections.

Concern: NGC.005	**Comment:** W08.013	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Gilchrist	**Page:** 23–24	**Org:** Northern States Power

A utility representative pointed out that utilities need to provide a good demonstration for capacity because this is an area of interest to the States. In this regard, the NRC should provide more background information on why eleven regions were used instead of the nine North American Electric Reliability Council divisions. Purchasing electricity from Canada should also be considered.

Concern: NGC.006	**Comment:** W08.014	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Gilchrist	**Page:** 24	**Org:** Northern States Power

An industry representative wanted more detail on the 8.4 percent number that represents the amount of electricity that could be saved in the future by energy-saving measures. Also, the NRC should explain what energy-saving measures mean.

Concern: NGC.007	**Comment:** W08.015	**Subtopic:** Reliability of power supply
Commenter: Brown	**Page:** 25	**Org:** University of Massachusetts Lowell/ Committee for a Constructive Tomorrow

A public interest group representative pointed out that the reliability of power supply needs to be addressed, and not just whether there is enough capacity. (He seems to suggest that the main focus of the analysis is on future demand and whether there is enough capacity to meet that demand, but reliability of the power supply is not considered.)

Concern: NONE	**Comment:** W08.016	**Subtopic:** Supportive statement
Commenter: Brown	**Page:** 27	**Org:** University of Massachusetts Lowell/ Committee for a Constructive Tomorrow

A public interest group representative agrees with the NRC's finding that there will be a need for more power in the future.

Concern: NGC.005	**Comment:** W08.017	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Jenkins	**Page:** 29	**Org:** Public Service Commission of Wisconsin

A State representative expressed concern that there was insufficient information provided regarding the forecasting approach used. Specifically, she mentioned that the forecasts they use in Wisconsin "are a combination of end use and econometric."

Concern: NGC.008	**Comment:** W08.018	**Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Jenkins	**Page:** 29	**Org:** Public Service Commission of Wisconsin

A State representative noted that the capacity factors they use [in Wisconsin] for both old and new base-loaded plants range from 40 to 80 percent. In particular, the capacity factor assumed for Point Beach is 80 percent. Thus, the capacity factors used in the GEIS do not fit Wisconsin.

Concern: NGC.004	**Comment:** W08.019	**Subtopic:** State participation
Commenter: Jenkins	**Page:** 30	**Org:** Public Service Commission of Wisconsin

A State representative pointed out that the determination of need is a prerogative of the States, and there is substantial case law in support of this.

Concern: NGC.004	**Comment:** W08.020	**Subtopic:** State participation
Commenter: Gielecki	**Page:** 30–31	**Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative noted that the analysis should focus on whether there is sufficient evidence that there will be a need for capacity. For example, the GEIS did not address the fact that the nation's capacity stock is aging and that there have been hardly any orders for boilers of any kind. Moreover, the whole notion of supply diversification comes into play with this issue.

Concern: NGC.008	**Comment:** W08.021	**Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Eynon	**Page:** 32	**Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative agreed with a previous comment that, under adverse conditions, it was unlikely that extra generation from hydro power for the northwest region would occur. The DOE's forecasting assumes "median hydro conditions" that give rise to a capacity factor considerably less than the 60 percent used in the GEIS. Under the DOE's assumptions, the States of Washington, Oregon, and Idaho will require new capacity by the year 2006, which is well in advance of the 2020 timeframe used in the base case of the GEIS.

Concern: NGC.008	**Comment:** W08.022	**Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Eynon	**Page:** 33	**Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative noted that nuclear plants capacity factors have improved over the last four years; in 1988 the nationwide capacity was about 63.5 percent and to date it is about 66.7 percent. The GEIS assumes that nuclear plants operate at about 60 percent. The NRC might want to consider using 62 percent instead. The NRC might also want to consider how this could impact the need for power.

Concern: GIS.002	**Comment:** W08.023	**Subtopic:** Nuclear plants' status-documentation
Commenter: Eynon	**Page:** 34	**Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative suggested the need for a place in the document that indicated the status of all the nuclear plants currently under construction, operating, or indefinitely deferred.

Concern: NEP.006	**Comment:** W08.024	**Subtopic:** Periodic assessments
Commenter: McCarthy	**Page:** 39	**Org:** Minnesota Department of Public Service

A State representative suggested that the process for making periodic updates to the findings made in the GEIS should be explained in the documentation.

Concern: NEP.001	**Comment:** W08.025	**Subtopic:** Purpose or use of GEIS
Commenter: McCarthy	**Page:** 36	**Org:** Minnesota Department of Public Service

A State representative echoed concerns voiced by others that Category 1 issues preclude further consideration. If that was not the NRC's intent, he asked how an issue could be reopened.

Concern: DEC.013	**Comment:** W08.026	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Gielecki	**Page:** 44	**Org:** U.S. Department of Energy (Energy Infomation Administration)

A Federal agency representative noted that the decommissioning costs used in the analysis are actually under-estimates (i.e., unescalated costs). The details of those estimates, as well as the assumptions behind them, should be provided in the report.

Concern: NGC.004	**Comment:** W08.027	**Subtopic:** State participation
Commenter: Gleason	**Page:** 44–45	**Org:** New York State Energy Office

A State representative echoed the concern voiced by other State representatives regarding consideration of the need issue on a case-by-case basis and the States' jurisdictional responsibilities on this matter.

Concern: NGC.009	**Comment:** W08.028	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Brandenburg	**Page:** 46	**Org:** Commonwealth Edison Company of New York

A utility representative asked how the NRC intends "to attempt harmonizing its conclusions on capacity requirements with environmental considerations relative to opportunities for air emissions avoidance through fossil plant retirements or anticipated future regulation of greenhouse gas production, carbon budgets, etc."

Concern: NGC.004 **Comment:** W08.029 **Subtopic:** State participation
Commenter: Gleason **Page:** 50 **Org:** New York State Energy Office

In response to an NRC staff's question on whether the generating capacity currently provided by licensees will not be needed in the future, a State representative pointed out that they cannot possibly make a decision at this time on an issue that could arise 16 or 17 years into the future. (This comment appears to support the concern raised in Comments W08.002 and W08.005 that there are a lot of uncertainties in projecting need.)

Concern: NONE **Comment:** W08.030 **Subtopic:** Supportive statement
Commenter: Stancavage **Page:** 51 **Org:** General Electric Company

A utility representative agreed with the NRC that there will indeed be a need for additional generating capacity over the next 20 years.

Concern: NGC.007 **Comment:** W08.031 **Subtopic:** Reliability of power supply
Commenter: Fuoto **Page:** 52 **Org:** ERCE

An engineering services representative asked how energy storage technology, fuel cells, etc. are factored into the need for generation and whether they will significantly affect the modeling by shifting peak generation to base load generation.

Concern: NGC.004 **Comment:** W08.032 **Subtopic:** State participation
Commenter: McCarthy **Page:** 54 **Org:** Minnesota Department of Public Service

A State representative asked whether the NRC is comparing comparable commodities or variables and if they could be factored in [the cost analysis] neatly.

Concern: POA.001 **Comment:** W09.001 **Subtopic:** SAMDAs
Commenter: Stewart-Smith **Page:** 17–19; 46–47 **Org:** Oregon Department of Energy

A State representative does not believe that an operating plant will undergo the same scrutiny regarding requirements for retrofits during its application for renewal as it did during its original operating license. For example, the Trojan plant in Oregon was built in the early 1970s, and the understanding of the potential magnitude of a major seismic event in the Pacific Northwest is considerably greater now. Since the plant would be built to a higher earthquake standard if it were to be built today, the commenter believes that license renewal is a good time to examine plant retrofits that would upgrade the plant to meet current technology. Consequently, the assumption of not considering severe accident mitigation design alternatives (SAMDAs) during license renewal may not be valid.

Concern: POA.029 **Comment:** W09.002 **Subtopic:** Categorization of issues
Commenter: Littlefield **Page:** 22–23 **Org:** Yankee Atomic Electric Company

A utility representative commented that while the severe accident analysis is a very thorough effort, the message that it is a bounding analysis needs to be brought out more in the text and again in the conclusions and summary at the end of the chapter. As an example, the commenter indicated that the use of a 95 percent upper confidence bound regression analysis (to relate exposure index to impact on the population for an atmospheric release), in combination with the conservatism built into the base data from the final environmental statements, yields a result that reflects between one to six orders of magnitude of conservatism (higher dose to the public) than what would actually be expected from the atmospheric pathway. Therefore, as a bounding effort, the text should make it clear that it does not represent a realistic assessment of plant risks.

Concern: POA.003 **Comment:** W09.003 **Subtopic:** Severe accidents
Commenter: Littlefield **Page:** 23–24 **Org:** Yankee Atomic Electric Company

A utility representative recommended that further clarification be provided in the GEIS for Table 5.15, which lists the reactor sites at which the drinking water pathway is not bounded by Femi 2. The text implies that the criteria for including sites in that table are based on residence time and surface area-to-volume ratio of the receiving water bodies. However, some of the sites listed in the table have very short residence times compared to Femi 2, and it is not clear why they are included in the table.

Concern: POA.003 **Comment:** W09.004 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Littlefield **Page:** 24 **Org:** Yankee Atomic Electric Company

A utility representative recommended that further clarification be provided in the GEIS for Table 5.16, which lists the annual edible food harvest for several sites. The data (which he believes was taken right out of the liquid pathway generic study) lists a larger aquatic food harvest for small rivers than it does for large rivers, and it is not clear why this should be the case.

Concern: POA.002 **Comment:** W09.005 **Subtopic:** Severe accidents
Commenter: Littlefield **Page:** 24 **Org:** Yankee Atomic Electric Company

A utility representative indicated that the discussion of uncertainties in GEIS Section 5.3.5 talks about external hazards and external event vulnerabilities, but does not mention the individual plant examination (IPE) process. He recommends that since the IPE effort is something that the industry is now doing, it is worth indicating in the section that those external event vulnerabilities will be studied over the next few years.

Concern: POA.004 **Comment:** W09.006 **Subtopic:** Categorization
Commenter: Gallo **Page:** 25–31 **Org:** Hopkins and Sutter

An industry lawyer questioned whether the analysis in Chapter 5 of the GEIS (which indicates that the risk of severe accidents is determined to be small) did indeed encompass all 118 plants. If it did not, the Category 1 designation for the severe accident issue may not be justified. Moreover, he said that if the objective of the GEIS is to specify whether the impact from severe accidents is low, moderate, or high, there has to be a reasonable basis for determining whether or not all 118 plants were considered.

Concern: POA.005 **Comment:** W09.007 **Subtopic:** SAMDAs
Commenter: Gallo **Page:** 39; 43 **Org:** Hopkins and Sutter

An industry lawyer questioned why SAMDAs are treated as a separate issue, and not just subsumed into the severe accident issue, which was characterized as Category 1. This treatment appears to be inconsistent with the GEIS methodology regarding severe accidents. Since the impact for severe accidents was found to be small, the methodology states that consideration of mitigative actions is not warranted when the impact is negative. Additionally, it is inconsistent in that other mitigation or mitigating actions that might be associated with other environmental impacts are not given a separate category.

Concern: POA.006 **Comment:** W09.008 **Subtopic:** Categorization
Commenter: Gallo **Page:** 44–45 **Org:** Hopkins and Sutter

An industry lawyer indicated that there is an outstanding SECY paper that says without qualification that SAMDAs cannot be addressed for advanced light water reactors (LWRs) on a generic basis. He stated that some "unkind person" may view that same consideration as applying to current LWRs.

Concern: POA.004 **Comment:** W09.009 **Subtopic:** Categorization
Commenter: Cohen **Page:** 49; 54–55 **Org:** Sanford Cohen and Associates

A consulting firm representative commented that in other sections of the GEIS, there appears to be a concerted effort to "bound" the universe of reactors, so that the decision regarding the "generic nature" is defensible. That does not seem to be the case in severe accidents, where the principal thrust was to perform a realistic NEPA analysis. (Note: This characterization of the analysis as being realistic is in contrast with the industry perspective that it is bounding—see Comment W09.002.) Therefore, he questions whether the Category 1 assignment is a defensible conclusion. Additionally, he believes that a plant-specific risk analysis can bound the environmental impacts sufficiently to reach a Category 1 determination, but since a risk analysis has not yet been performed for every plant, the Category 1 assignment may not be defensible. He indicated that if severe accidents were made a Category 2 issue, then plants lacking an individual risk analysis could be required to supply one as part of their environmental statement accompanying the license application.

Concern: POA.004 **Comment:** W09.010 **Subtopic:** Categorization
Commenter: Fuoto **Page:** 56–57 **Org:** ERCE

An engineering services representative recommended an alternative to the bounding criteria if severe accidents are made a Category 2 issue. He indicated that since IPEs and Individual Plant External Event Evaluations will be submitted for all plants, the criteria could be that SAMDAs would not have to be considered for sites that are at or below the "safety goal policy statement" derived values.

Concern: POA.003 **Comment:** W09.011 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Bishop **Page:** 57–58 **Org:** Nuclear Management and Resources Council

An industry representative questioned with respect to SAMDAs (and in fact all of the GEIS) how "small" must a risk be before it is deemed "insignificant".

Concern: POA.008 **Comment:** W09.012 **Subtopic:** Analysis of issues
Commenter: Thron **Page:** 60 **Org:** Minnesota Department of Health

A State representative asked whether the accident scenarios considered included those that would apply to independent spent fuel storage installations that many plants will need to establish. He is concerned about their impact on emergency preparedness plans, and questioned whether the issue should be folded into plant operations or be assessed separately.

Concern: NONE **Comment:** W09.013 **Subtopic:** Supportive statement
Commenter: Donnell **Page:** 63; 66 **Org:** ERCE

An engineering services representative agreed with the NRC position that the severe accident approach taken in Chapter 5 is more appropriate for NEPA than the bounding analyses found in other sections of the GEIS.

Concern: POA.007 **Comment:** W09.014 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Cohen **Page:** 66 **Org:** Sanford Cohen and Associates

A consulting firm representative commented that the primary purpose of the GEIS is to resolve issues that can be resolved. While the GEIS must defend its generic findings as well as satisfy NEPA requirements, the commenter believes that the defense of the generic table (Table 10.1 of the proposed rule) is more important. (This comment appears to be related to the necessity of taking a bounding approach in perfoming the analysis.)

Concern: POA.002 **Comment:** W09.015 **Subtopic:** Severe accidents
Commenter: Howey **Page:** 67 **Org:** Illinois Department of Nuclear Safety

A State representative commented that for plants outside the bound of the Fermi analysis, the GEIS used interdiction as a method of addressing the problem. He believes that the topic of interdiction was lightly glanced over within the report, without acknowledging that consideration of interdiction is difficult particularly with certain kinds of resources.

Concern: POA.009 **Comment:** W10.001 **Subtopic:** Categorization of issues
Commenter: Houck **Page:** 25 **Org:** Don't Waste U.S.

A public interest group representative recommended that seismic risks to nuclear power plants be included in the GEIS as Category 3. He believes that the Category 3 finding is justified because these risks are site-specific, and the estimates change over time as the understanding of the event increases.

Concern: POA.009 **Comment:** W10.002 **Subtopic:** Categorization of issues
Commenter: Houck **Page:** 25-26 **Org:** Don't Waste U.S

A public interest group representative recommended that evacuation risks be addressed in the GEIS as Category 3. He believes that individual plants need to address the issue, and cites the decision to not operate Shoreham as a basis for the significance of the issue.

Concern: POA.009 **Comment:** W10.003 **Subtopic:** Categorization of issues
Commenter: Houck **Page:** 26 **Org:** Don't Waste U.S.

A public interest group representative recommended that the GEIS address the site-specific issue of threats to the reactor from adjacent sources and vice versa as Category 3. He cited as an example the operating environment of the Vogtle plant, which could be affected by the Savannah River Weapons Plant.

Concern: AQE.005 **Comment:** W10.004 **Subtopic:** Aquatic issues-Reactor systems impacts on rivers and ecoregions
Commenter: Houck **Page:** 26-27 **Org:** Don't Waste U.S.

A public interest group representative commented that the GEIS gives insufficient attention to the aquatic impact of reactor plants on economically valuable fisheries. As an example, he cites the present concerns over the impact of the Millstone reactor in Connecticut upon the lobster, oyster and flounder fisheries in Niantic Bay.

Concern: SWM.017 **Comment:** W10.005 **Subtopic:** Waste handling
Commenter: Houck **Page:** 28 **Org:** Don't Waste U.S.

A public interest group representative would like to see the Nation's reactors ranked in terms of their site suitability for waste handling. As a result of the Vermont Yankee site characterization plan, the general NRC recommendation is that the site, right on the banks of the Connecticut River, is unsuitable for long-term LLW storage.

Concern: AQE.005 **Comment:** W10.006 **Subtopic:** Aquatic issues-Reactor systems impacts on rivers and ecoregions
Commenter: Houck **Page:** 28-29 **Org:** Don't Waste U.S.

A public interest group representative is concerned that the GEIS evaluates nuclear reactor plants as individual entities. This approach fails to account for the fact that many facilities are part of collective "reactor systems" comprised of multiple plants, which cumulatively impact some of the nation's largest rivers. As examples, he points to the Commonwealth Edison system around Chicago and the Tennessee Valley Authority, which impact the heavily-polluted southern end of Lake Michigan and the Tennessee River, respectively.

Concern: SWM.001 **Comment:** W10.007 **Subtopic:** LLW storage/disposal
Commenter: Houck **Page:** 30-32 **Org:** Don't Waste U.S.

A public interest group representative was concerned that the public will become exasperated by the relicensing process because no facility is underway, there has been little progress in the LLW siting process, there have been some expensive clean-up situations such as those at Maxey Flats and Sheffield, and there is a [potential] increased burden from relicensing as the time of public assumption of the legal title for waste from all unsited compacts and unaffiliated States approaches (i.e., approximately 11 million cubic feet of waste based on 18 expected relicensings through 1995 derived from Figure 1, NUREG-1440 and on figures of 62,000 cubic feet for BWRs and 119,000 cubic feet for PWRs which appear to be from Table 6.5, GEIS).

Concern: SWM.009 **Comment:** W10.008 **Subtopic:** Spent fuel
Commenter: Ball **Page:** 32–33; 35–36; 45 **Org:** Minnesota Department of Health

A State representative pointed out that the 4 or 5 pages of discussion on spent fuel in the GEIS are not sufficient to conclude that the availability of onsite storage facilities (dry storage casks) will "take care of the problem" since the public and the States need more time to look at site-specific information and examine whether a determination for an additional 20 years can be made. Dry cask storage should not be considered a "tried and true" type of storage since there has not been a lot of experience with it as compared to reactors. Either spent fuel should be treated on a site-specific basis, not as Category 1, or more specific information and analysis should be provided on the different kinds of dry cask storage technologies used.

Concern: SWM.001 **Comment:** W10.009 **Subtopic:** LLW storage/disposal
Commenter: Ball **Page:** 33–35 **Org:** Minnesota Department of Health

Referring to an earlier comment from a public interest group representative, a State representative expressed the need for site-specific discussion, for the public's sake, of offsite facilities for LLW. Minnesota has sufficient storage capabilities until 1995, but by 1997 or 1998 it will probably be in a situation where it will not have an offsite facility for LLW.

Concern: SWM.016 **Comment:** W10.010 **Subtopic:** Categorization/SWM issues
Commenter: Miller **Page:** 36 **Org:** Illinois Department of Nuclear Safety

A State representative believes that, in reality, the solid waste management issues will either be Category 2 or 3 because the public, and commerce commissions and other similar agencies will undoubtedly require site-specific infomation before utilities can proceed with relicensing.

Concern: NONE **Comment:** W10.011 **Subtopic:** Supportive statement
Commenter: Miller **Page:** 36; 47 **Org:** Illinois Department of Nuclear Safety

A State representative commented that the LLW storage issue is at least a Category 2 issue, as ranked, and that is probably appropriate. He appreciated that LLW disposal was left as at least Category 2 also.

Concern: SWM.001 **Comment:** W10.012 **Subtopic:** LLW storage/disposal
Commenter: Miller **Page:** 36–37 **Org:** Illinois Department of Nuclear Safety

Referring to Illinois, a State representative voiced concern that even if a LLW site is opened in the near future, that site may not be available to accommodate waste disposal resulting from renewal. Sites have a 50-year licensed life and if all 13 reactors in Illinois apply for a 20-year extension, they could be outside the license term when they do some waste disposal activities. Thus, a site
may be available at the time of relicensing, but might not be available for disposal activities resulting from renewal.

Concern: SWM.013 **Comment:** W10.013 **Subtopic:** Mixed waste
Commenter: Miller **Page:** 37–38 **Org:** Illinois Department of Nuclear Safety

A State representative was concerned that because the EPA and the NRC have not yet prepared a joint regulation on mixed waste, it is difficult to determine what States need to do in terms of licensing requirements for mixed waste.

Concern: SWM.014 **Comment:** W10.014 **Subtopic:** Mixed waste
Commenter: Miller **Page:** 38; 51–52 **Org:** Illinois Department of Nuclear Safety

A State representative believes that mixed waste and other solid waste management issues will, in reality, be Category 2 issues because States will require utilities to address them, although he does not disagree with the analysis of the issue from the hazard standpoint. Moreover, the availability of a facility licensed to accept mixed waste should be addressed in the NRC's relicensing process and that would put the issue in Category 2.

Concern: SWM.009 **Comment:** W10.015 **Subtopic:** Categorization/SWM issues
Commenter: Muckerheide **Page:** 38–40; 42–44 **Org:** Massachusetts Emergency Management Agency

A State representative was concerned about the disposition of some of the solid waste management issues as Category 1 because these issues are site-specific; have different legal ramifications, or authorities or sources; and public concerns need to be addressed. He suggested that they be made Category 2 by adding bounding criteria that assure a facility's long-term ability and commitment to provide for storage and disposal instead of presuming that the licensing extension decision need not address these issues. To the extent that a de novo analysis is not needed, the issue does not need a Category 3 ranking. Moreover, the following points should be considered:

1. The rule may be challenged when too many issues that have to be resolved for individual sites are "buried" in the context of a generic finding made in 1992, which does not recognize actual conditions at the time of license renewal which may be beyond the year 2000. If the rule is too all-inclusive, it will become a case for litigation and delay the permitting process.

2. Site-specific considerations, including permits and State regulatory approvals, should be addressed during the NRC's relicensing process. This could actually shorten the process.

Concern: SWM.009 **Comment:** W10.016 **Subtopic:** Spent fuel
Commenter: Miller **Page:** 41–42 **Org:** Illinois Department of Nuclear Safety

In response to an NRC staff question on whether spent fuel storage could be analyzed in a bounding case, a State representative reiterated that the spent fuel storage issue has to be addressed on a site-specific basis because the technologies for storage are relatively new and, in reality, miniature waste repositories are being created at plants, and this was not explained to the public. Regardless of any bounding calculations, the public will have to be convinced the correct decisions are being made and generic bounding calculations are not convincing to the public. If site-specific issues are not addressed in the formal license application, they will be before State agencies such as the Illinois Commerce Commission.

Concern: SWM.009 **Comment:** W10.017 **Subtopic:** Spent fuel
Commenter: Muckerheide **Page:** 44–45 **Org:** Massachusetts Emergency Management Agency

A State representative commented that the storage issue is focused on the size of the facility and the commitment of the site to store spent fuel during the additional 20-year period. It is not focused on whether a facility has been designed for a particular seismic level since such issues will be addressed in the relicensing technical process.

Concern: SWM.015 **Comment:** W10.018 **Subtopic:** Nonradiological waste
Commenter: Houck **Page:** 46 **Org:** Don't Waste U.S.

A public interest group representative questioned the Category 1 ranking for nonradiological waste. He believes this should be treated on a case-by-case basis given that there have been problems related to this issue at some reactors (e.g., Diablo Canyon being responsible for the deaths of abalone species in California due to metallic output and large volumes of water effluent, and Comanche Peak contaminating so much groundwater from 11 huge toxic waste dumps that the quality of its water supply is in question).

Concern: SWM.002 **Comment:** W10.019 **Subtopic:** LLW storage
Commenter: Muckerheide **Page:** 47–48 **Org:** Massachusetts Emergency Management Agency

With regard to the NRC's proposal for addressing the issue of LLW storage generically through a bounding analysis (i.e., Category 2), a State representative voiced concern that the bounds do not include the size of facilities, commitments from those facilities that they would be available to store wastes generated during the 20-year renewal period, or compacts that States are committed to. It cannot be presumed that facilities will be available.

Concern: SWM.003 **Comment:** W10.020 **Subtopic:** LLW disposal
Commenter: Lee **Page:** 48–50 **Org:** North Carolina Department of Environment, Health and Natural Resources

A State representative questioned why the figures in Table 6.2 of the GEIS were considered conservative. Specifically, he pointed out that the compact waste numbers are smaller than the total amount of waste shipped, yet compact waste data were stated as conservative. Moreover, he said that North Carolina had one BWR that shipped over 44,000 curies in 1987, which is larger than the 28,000 curies for all BWRs given in Table 6.2.

Concern: NONE
Commenter: Lee
Comment: W10.021
Page: 50–51
Subtopic: Supportive statement
Org: North Carolina Department of Environment, Health and Natural Resources

A State representative commented that the NRC mentioned a significant point—that it will be essential to conduct a 10 CFR 50.59 analysis to evaluate both the LLW disposal and storage issues. This may be applicable to some of the issues raised by Don't Waste U.S.

Concern: SWM.009
Commenter: Muckerheide
Comment: W10.022
Page: 54–55
Subtopic: Spent fuel
Org: Massachusetts Emergency Management Agency

A State representative recommended that the spent fuel issue be treated as Category 2 so that each site will have an opportunity to demonstrate that it fits within the bounding analysis. In addition, the bounding analysis should include the determination of the site's long-term ability and commitment to provide for dry storage.

Concern: SWM.010
Commenter: Brown
Comment: W10.023
Page: 59–60
Subtopic: Spent fuel
Org: Iowa Department of Commerce

A State representative raised a question regarding constraints on electrical output as a result of spent fuel storage problems. Specifically, he asked if longer burn-up for nuclear fuel would lead to power deratings, imply running at less than full power for extensive periods of time, imply lower capacity fractions, and be longer or shorter in the future compared to the present.

Concern: SWM.001
Commenter: Gleason
Comment: W10.024
Page: 60
Subtopic: LLW storage/disposal
Org: New York State Energy Office

A State representative questioned how the LLW disposal issue could be designated as Category 2 when this is a State responsibility. He also asked how the State's role in this area would be recognized in an individual relicensing proceeding.

Concern: SWM.005
Commenter: Callen
Comment: W10.025
Page: 62–63
Subtopic: LLW disposal
Org: Michigan Public Service Commission

A State representative suggested that the LLW tabulations be revised since Michigan is no longer a member of the Midwest Compact.

Concern: SWM.011 **Comment:** W10.026 **Subtopic:** Spent fuel
Commenter: Callen **Page:** 63–66 **Org:** Michigan Public Service Commission

A State representative suggested that the discussion on spent fuel be expanded to reflect the following:

- Include in Table 6.12 on spent fuel inventories the annual generation rates for the 20-year renewal period. This would provide useful information on the transportation and disposal system requirements.

- Provide additional discussion on ultimate disposal including the current site characterization problems in Nevada, the purpose and effectiveness of the Nuclear Waste Policy Act, the fact that defense wastes and the additional waste generated by renewing plant licenses may require a second repository, and the possibility of at-reactor storage becoming an ultimate repository.

- Include the assumptions for the cost of spent fuel storage since they could not be found in Chapter 6 or 9 or Appendix H. The ultimate cost for disposal for the 40-year licensing is estimated at over $30 billion, but Michigan is not comfortable that that will be sufficient for the whole program. The States are paying the Federal Government for waste disposal, but the States still have the waste.

Concern: SWM.012 **Comment:** W10.027 **Subtopic:** Spent fuel
Commenter: Callen **Page:** 67 **Org:** Michigan Public Service Commission

A State representative suggested clarifying how the public can submit comments on spent fuel if the issue is resolved in the GEIS as Category 1.

Concern: SWM.006 **Comment:** W10.028 **Subtopic:** LLW disposal-costs
Commenter: Muckerheide **Page:** 68–69 **Org:** Massachusetts Emergency Management Agency

A State representative recommended a more complete development of costs associated with LLW disposal since that will be addressed when considering whether it is economical to continue to run or refurbish a plant. The following points were suggested for inclusion: (1) extreme costs could provide the incentive to reduce waste volume; (2) if there are 1 or 2 plants in a State and a plant is shut down, the cost of providing a disposal facility for the remaining waste generators becomes outrageous because of the decentralization of responsibility for LLW disposal; and (3) for smaller operations, today's waste disposal costs may not adequately reflect the final status of some compact facilities and/or the costs of onsite storage in the absence of compacts.

Concern: POA.030 **Comment:** W10.029 **Subtopic:** Postulated accidents
Commenter: Houck **Page:** 29 **Org:** Don't Waste U.S.

A public interest group representative commented that attention should be given to the fact that some reactors have an impact upon large aquatic systems. In this regard, he was not impressed to see that Prairie Island was listed [in Table 5.19] as being on a small river—namely the Mississippi.

Concern: NONE **Comment:** W11.001 **Subtopic:** Supportive statement
Commenter: Stancavage **Page:** 11 **Org:** General Electric Company

A utility representative indicated that he thought all significant issues have been covered in the analysis of alternatives.

Concern: GIS.012 **Comment:** W11.002 **Subtopic:** Cost-benefit analysis
Commenter: Stancavage **Page:** 11 **Org:** General Electric Company

A utility representative expressed the need to provide more detail on the economic threshold analysis (e.g., providing the underlying assumptions) in order to help ensure that a license renewal applicant can perfom the analysis and defend it as reasonable.

Concern: ALT.007 **Comment:** W11.003 **Subtopic:** Economic analysis-units of measure
Commenter: Stancavage **Page:** 11–12 **Org:** General Electric Company

A utility representative pointed out that the comparison of alternatives should be made on the basis of a single figure of merit (e.g., mills per kWh).

Concern: ALT.010 **Comment:** W11.004 **Subtopic:** Cost of new nuclear units
Commenter: Stancavage **Page:** 12 **Org:** General Electric Company

A utility commenter questioned the basis for the $5,000/kW cost for new nuclear units assumed in the GEIS because, in research done by the DOE, Electric Power Research Instititue (EPRI), and other organizations, the cost of new nuclear units is $1,200–$1,500/kW or 4.3 mills/kWh. This lower cost puts nuclear power in a competitive position relative to coal, oil, or gas generation.

Concern: ALT.018 **Comment:** W11.005 **Subtopic:** Coal impacts
Commenter: Stancavage **Page:** 13 **Org:** General Electric Company

On the analysis of coal plants, a utility representative pointed out that the GEIS should recognize that coal plants larger than 75 MW should be able to operate for 40 years based on the evidence that they have seen so far from fossil plants in the U.S.

Concern: ALT.020 **Comment:** W11.006 **Subtopic:** Geothermal power
Commenter: Stancavage **Page:** 13 **Org:** General Electric Company

A utility representative pointed out that the analysis of geothermal power, particularly for California, should consider the impacts of the CAA, which may require geothermal plants to get permits for atmospheric emissions. There also may be some additional EIS or justification needed before waste effluents are injected back into the ground.

Concern: ALT.017 **Comment:** W11.007 **Subtopic:** Biomass energy/Categorization
Commenter: Stancavage **Page:** 13 **Org:** General Electric Company

A utility representative pointed out that the GEIS did not account for the significant amount of land that is required for biomass energy. To support this view, he referred to a study that a utility did that suggested that a 100 MWe woodburning plant would need about a circle of 100 miles in diameter just to supply fuel for that facility.

Concern: ALT.025 **Comment:** W11.008 **Subtopic:** Solar energy
Commenter: Stancavage **Page:** 14 **Org:** General Electric Company

A utility representative referred to a statement on page 9-10 (actually pp. 9-10 to 9-11) of the GEIS about solar energy requiring large amounts of energy storage if natural gas is used as a backup fuel.

Concern: GIS.012 **Comment:** W11.009 **Subtopic:** Cost-benefit analysis
Commenter: Gilchrist **Page:** 14–15 **Org:** Northern States Power

A utility representative pointed out their difficulty in applying the analysis presented in Appendix H of the GEIS to their particular plant. Specifically, she observed that the cost numbers presented in Table H-7 for Monticello are high. They are based on 1986 data (which are very conservative) before investigative work had been done.

Concern: GIS.012 **Comment:** W11.010 **Subtopic:** Cost-benefit analysis
Commenter: Gilchrist **Page:** 15 **Org:** Northern States Power

A utility representative agreed with another commenter that there is insufficient explanation given in Appendix H to really know how to use the information provided in Tables H-12 and H-13. The Appendix should address what the NRC considers as operation and maintenance (O&M) costs, or possibly say that all plants are on the same basis so that Federal Energy Regulatory Commission Form 1 information can be used. Moreover, the basis for the derivation of the equation given in Table H-13 should be provided in order for license renewal applicants to determine how they fit into the threshold economic analysis.

Concern: GIS.012 **Comment:** W11.011 **Subtopic:** Cost-benefit analysis
Commenter: Gilchrist **Page:** 16 **Org:** Northern States Power

A utility representative wanted to know the basis for the cost associated with additional regulations imposed by relicensing and operation during the renewal period, which is given as $20/kW. They need this information to ensure that their analysis is on the same basis as the other plants and that they are using the correct data.

Concern: FRN.001 **Comment:** W11.012 **Subtopic:** Comment period
Commenter: Sherman **Page:** 16 **Org:** Vermont Department of Public Service

A State agency representative requested an extension of the comment period. He said the 7-week review period before this workshop has not been sufficient for a meaningful review and comment on the proposed rule and the accompanying GEIS. The December 16th comment deadline also will not allow sufficient time for the review that is necessary. In particular, because of so-called "resolved" areas in the proposed rule, it is necessary for Vermont to review the GEIS as if it were Vermont Yankee's and Yankee Rowe's actual license renewal applications. Due to budget restrictions, it is not clear that this review can be done expeditiously. It will take Vermont months, not weeks, to complete the review.

Concern: ALT.015 **Comment:** W11.013 **Subtopic:** Demand forecast
Commenter: Sherman **Page:** 17–18 **Org:** Vermont Department of Public Service

A State representative believes that the GEIS economic inputs for need and alternative evaluations are not accurate as stated now, especially for the New England region. Specifically, he noted that the forecasted demand has changed significantly from the 1994 forecast used in the GEIS. NEPOOL forecasts in April of 1991 predicted significantly lower demand in New England. Moreover, demand side management (DSM) forecasts for New England are significantly higher than those used in the high conservation case in the GEIS. For example, the GEIS assumes 5.4 percent less generation in 2000, whereas Vermont believes that 20 percent less can be achieved by the year 2000. The Vermont Public Service Board has applied this 20 percent forecast in cases involving long-term planning.

Concern: ALT.001 **Comment:** W11.014 **Subtopic:** Categorization of issues
Commenter: Sherman **Page:** 17–18 **Org:** Vermont Department of Public Service

A State representative disagreed with designating need and alternatives issues as Category 1 for the following reasons: (1) the alternatives chapter compares the renewable sources to the aggregate capacity for license renewal, which is not the necessary comparison to conclude a Category 1 rating since the comparison must be for specific bounding plants; (2) significant changes in demand forecasts since the preparation of the GEIS demonstrate that justification of

need and alternatives cannot be resolved generically for periods of 20, 30 and 40 years in advance. He believes need and alternatives issues should be ranked as Category 3.

Concern: ALT.013	**Comment:** W11.015	**Subtopic:** Comparison of impacts
Commenter: Sherman	**Page:** 18	**Org:** Vermont Department of Public Service

A State representative noted that the crucial comparison for alternatives is that of operational emissions with additionally generated volumes of HLW and LLW. These impact comparisons do not appear clearly in the GEIS. In support of his position, he brought up the issue of uncertainty in siting radioactive waste disposal facilities (e.g., it is not clear whether a LLW disposal site can be found in Vermont, and relicensing could require a second HLW repository).

Concern: ALT.017	**Comment:** W11.016	**Subtopic:** Biomass energy/Categorization
Commenter: Sherman	**Page:** 19	**Org:** Vermont Department of Public Service

A State representative said that there is insufficient discussion in the GEIS to support the conclusion that biomass power production does not offer "significant environmental or economical advantage over license renewal." For example, he believes that, in Vermont, 20 years of impacts from wood gasification may be greatly more desirable than 20 years more from radioactive waste.

Concern: ALT.011	**Comment:** W11.017	**Subtopic:** Comparison of alternatives
Commenter: Sherman	**Page:** 19	**Org:** Vermont Department of Public Service

A State representative pointed out that limiting the comparison of license renewal to new coal or new nuclear capacity is not correct for Vermont since neither is a likely possibility, either from a public perception or cost standpoint.

Concern: ALT.021	**Comment:** W11.018	**Subtopic:** Imported power
Commenter: Sherman	**Page:** 19	**Org:** Vermont Department of Public Service

A State representative pointed out that the GEIS omits the alternative of purchased power from Canada which Vermont and other northeastern States are presently using and would consider in the future.

Concern: ALT.019 **Comment:** W11.019 **Subtopic:** Cogeneration
Commenter: Sherman **Page:** 19 **Org:** Vermont Department of Public Service

A State representative pointed out that the GEIS also apparently omits coverage of capacity through cogeneration, small power producers, and combinations of such sources.

Concern: ALT.003 **Comment:** W11.020 **Subtopic:** State/NRC agreement
Commenter: Sherman **Page:** 20 **Org:** Vermont Department of Public Service

A State representative expressed concern that the generic resolution approach limits the degree of public participation in the license renewal process. The NRC must ensure that, by improving the efficiency of the process of environmental review, it does not eliminate the openness it views as absolutely necessary for future nuclear power decisions. Hence, he suggests that the NRC consider a new type of State agreement program, one in which the need and alternatives evaluation for the EIS would be performed for the NRC by the States at the time of each specific plant license renewal application. (This suggestion further supports commenter's earlier position that the subjects of need and alternatives should be ranked as Category 3.)

Concern: ALT.010 **Comment:** W11.021 **Subtopic:** Cost of new nuclear units
Commenter: Gielecki **Page:** 22 **Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative suggested that the discussion of conventional nuclear technology be clarified since "conventional as we know it is not an option." If conventional means improved versions of current technology, then that is alright, but still the cost of $5,000/kW is erroneous.

Concern: ALT.014 **Comment:** W11.022 **Subtopic:** Advanced nuclear technologies
Commenter: Gielecki **Page:** 22 **Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative suggested that the discussion of advanced technologies should differentiate between those reactor types that are being designed with passive safety features versus the modular high temperature gas-cooled reactor and the liquid metal reactor.

Concern: ALT.008 **Comment:** W11.023 **Subtopic:** Data on nuclear generating capacity
Commenter: Gielecki **Page:** 23 **Org:** U.S. Department of Energy (Energy Information Administration)

A Federal agency representative noted that the 1990 data for nuclear power generating capacity in the U.S. is available (nuclear comprises 20.6 percent of utility generation). The GEIS uses 1989 data and should be updated.

Concern: NONE
Commenter: Brown

Comment: W11.024
Page: 23

Subtopic: Supportive statement
Org: University of Massachusetts Lowell/ Committee for a Constructive Tomorrow

A public interest group representative agreed that the economic threshold analysis is an important consideration whereby final judgment is reserved for the individual plant application.

Concern: ALT.011
Commenter: Jenkins

Comment: W11.025
Page: 24

Subtopic: Comparison of alternatives
Org: Public Service Commission of Wisconsin

A State representative noted that the range of alternatives covered is comprehensive. However, she found that details on some of the alternatives did not match what Wisconsin utilities are planning to do. For example, Wisconsin utilities are planning to add 2,000 MW of new coal capacity by year 2010.

Concern: ALT.018
Commenter: Jenkins

Comment: W11.026
Page: 24

Subtopic: Coal impacts
Org: Public Service Commission of Wisconsin

A State representative pointed out that sulfur, as a rule, is a byproduct and the slag is saleable. Hence, several of the impacts that are discussed in the GEIS are incorrect.

Concern: NONE
Commenter: Jenkins

Comment: W11.027
Page: 24–25

Subtopic: Transmission lines
Org: Public Service Commission of Wisconsin

A State representative pointed out that Wisconsin has a policy of corridor sharing that substantially reduces the amount of land required and the severity of the environmental impact of new transmission lines.

Concern: ALT.018
Commenter: Jenkins

Comment: W11.028
Page: 25

Subtopic: Coal impacts
Org: Public Service Commission of Wisconsin

A State representative pointed out that Wisconsin's air regulations require the control of fugitive dust.

Concern: ALT.010
Commenter: Jenkins

Comment: W11.029
Page: 25

Subtopic: Cost of new nuclear units
Org: Public Service Commission of Wisconsin

A State representative noted that the costs found in the EPRI's 1989 *Technical Assessment Guide* were not used for the costs of new power plants. She wanted to see a reference for the source for the costs used for new power plants.

Concern: GIS.012
Commenter: Jenkins

Comment: W11.030
Page: 25–26

Subtopic: Cost-benefit analysis
Org: Public Service Commission of Wisconsin

A State representative noted that (in Wisconsin) the choice of alternatives and alternative ways to meet a given level of demand is a decision made by the Public Utility Commission and it is based not only on cost, but also on a consideration of the economic externalities of the technology. For many Wisconsin citizens, the commitment to an additional 20 years of radioactive waste production is going to be a fatal flaw in license extension, particularly if a second site would be needed for HLW disposal. A lot of citizens are willing to accept the environmental impacts of replacing nuclear power with coal.

Concern: ALT.016
Commenter: Harvey

Comment: W11.031
Page: 27

Subtopic: Demand side management
Org: New York State Department of Environmental Conservation

A State representative observed that the tone of the GEIS is more one of justification [for nuclear] than one of seeking alternatives. It doesn't really analyze a variety of scenarios. Specifically, there is no high-level DSM analyzed. The 8.4 percent carried over from the need section is considerably lower than some States, such as New York and Vermont, are now considering. There should be an analysis or discussion of situations where the government becomes heavily involved, that is, something more than just price-driven energy conservation.

Concern: ALT.023
Commenter: Harvey

Comment: W11.032
Page: 27

Subtopic: Photovoltaics
Org: New York State Department of Environmental Conservation

A State representative noted that, although photovoltaics are very unlikely to be a big supply source, they could at some point be very important on the demand side. Those types of analyses should be included.

Concern: ALT.022
Commenter: Harvey
Comment: W11.033
Page: 27
Subtopic: Natural gas
Org: New York State Department of Environmental Conservation

A State representative pointed out that the cost data are neither current nor do they reflect what is happening in New York State. In New York, given reliance on traditional technologies over the next 20 years, there is a very large potential for natural gas, which is very price competitive when combined as a cogeneration facility.

Concern: GIS.012
Commenter: McCarthy
Comment: W11.034
Page: 28
Subtopic: Cost-benefit analysis
Org: Minnesota Department of Public Service

A State representative supported a previous commenter's statement (see W11.002 and W11.003) about the need for more detail on the cost data and analysis, such as how the formulas were derived, and that the units used should be uniform.

Concern: FRN.001
Commenter: McCarthy
Comment: W11.035
Page: 28
Subtopic: Comment period
Org: Minnesota Department of Public Service

A State representative supported a previous commenter's request (W11.012) for more time for State agency comment on the proposed rulemaking package. The public also needs to perceive that a thorough job of reviewing the documents has been done and that they have had an opportunity to be listened to. The additional time needed is months, not days.

Concern: LIR.001
Commenter: Sherman
Comment: W11.036
Page: 42
Subtopic: Refurbishment schedule
Org: Vermont Department of Public Service

A State representative expressed uncertainty that the refurbishment schedules in the license renewal scenario reflect those that are likely to occur. It seems reasonable to assume that a plant should be almost as safe and licensable at the end of its 40th year as it was at any time during its operating period.

Concern: ALT.005
Commenter: McCarthy
Comment: W11.037
Page: 28
Subtopic: Economic analysis-waste storage and disposal
Org: Minnesota Department of Public Service

A State representative said that they found it difficult to determine (in the GEIS) the (cost) impacts of HLW and LLW disposal. For example, they need to know how sensitive the 2.6 cents/kWh used in the GEIS is to "some very uncomfortable scenarios" for dealing with waste, and the associated cost and uncertainty involved.

Concern: ALT.016
Commenter: McCarthy

Comment: W11.038
Page: 31

Subtopic: Demand side management
Org: Minnesota Department of Public Service

A State representative recommended that other data on high DSM scenarios be examined. The NRC should look into the unfolding opportunities for conservation and DSM in the electric industry (re: *Scientific American* article).

Concern: ALT.009
Commenter: McCarthy

Comment: W11.039
Page: 32

Subtopic: Cost of alternatives
Org: Minnesota Department of Public Service

A State representative said that very cheap alternatives are now becoming available. If the data used are more than 2 years old, the NRC might not be accounting for the most important cost-effective technologies. This issue should be considered because it affects the credibility of the GEIS.

Concern: ALT.023
Commenter: McCarthy

Comment: W11.040
Page: 32

Subtopic: Photovoltaics
Org: Minnesota Department of Public Service

A State representative recommended that photovoltaics be considered as an alternative technology. They could be viewed as having an impact on DSM, though not as a central power plant.

Concern: ALT.026
Commenter: McCarthy

Comment: W11.041
Page: 33

Subtopic: Wind power
Org: Minnesota Department of Public Service

A State representative pointed out that the data that have been collected seem to indicate that wind power generation could be a feasible alternative for Minnesota.

Concern: ALT.001
Commenter: McCarthy

Comment: W11.042
Page: 33

Subtopic: Categorization of issues
Org: Minnesota Department of Public Service

Citing the site-specific opportunities for considering other alternatives, a State representative believes that the arguments for designating the alternatives issue as Category 1 are very weak and suggests that more analysis is needed. He pointed out that this issue should possibly be a Category 3. Moreover, the threshold for considering it a Category 2 needs to be examined in more detail.

Concern: ALT.016	**Comment:** W11.043	**Subtopic:** Demand side management
Commenter: McCarthy	**Page:** 35	**Org:** Minnesota Department of Public Service

A State representative asked whether there is a way to obtain an aggregate number for the reduction in energy demand as a result of conservation programs since the 8.4 percent reduction used in the GEIS represents an increment above what was included in the base case, which also considered conservation. This would help in comparing numbers used in the GEIS with the 20 percent reduction that some States are using.

Concern: ALT.015	**Comment:** W11.044	**Subtopic:** Demand forecast
Commenter: Harvey	**Page:** 36	**Org:** New York State Department of Environmental Conservation

With regard to the demand reduction assumed in the GEIS, a State representative pointed out that in New York, the State policy is to reduce the "base case" forecasted demand (including programs in place until 1989) by 50 percent.

Concern: ALT.019	**Comment:** W11.045	**Subtopic:** Cogeneration
Commenter: Jenkins	**Page:**	**Org:** Public Service Commission of Wisconsin

A State representative observed that there has been an increased interest in cogeneration in Wisconsin, and apparently suggests that this could be a viable alternative.

Concern: ALT.019	**Comment:** W11.046	**Subtopic:** Cogeneration
Commenter: McCarthy	**Page:** 38	**Org:** Minnesota Department of Public Service

A State representative noted that, although very location specific, cogeneration can be economically competitive.

Concern: ALT.019	**Comment:** W11.047	**Subtopic:** Cogeneration
Commenter: Brown	**Page:** 39–40	**Org:** University of Massachusetts Lowell/ Committee for a Constructive Tomorrow

A public interest group representative recommended that caution be exercised with regard to the analysis of the potential of cogeneration (as voiced by several State representatives). He was concerned that optimizing the local point of view could lead to a nonoptimum solution from a global point of view. All the local optimum solutions might not be to the consumer's best interest.

Concern: ALT.001
Commenter: Sherman

Comment: W11.048
Page: 41

Subtopic: Categorization of issues
Org: Vermont Department of Public Service

A State representative echoed comments made by other State representatives that the analysis of the impacts of alternative energy sources should be done region-by-region, on a case-by-case basis. In later discussion (p. 54), he explained further his concern about preempting the States' prerogatives. Specifically, he mentioned that because of the specific economic structure in Vermont, the ratepayers would still be responsible for operating costs even if Vermont Yankee were no longer able to produce power. Such a situation emphasizes the need for State involvement at a specific time in the life of a plant.

Concern: GIS.006
Commenter: McCarthy

Comment: W11.049
Page: 45

Subtopic: Rulemaking & GEIS approach
Org: Minnesota Department of Public Service

Assuming that the purpose of the workshop on license renewal is to address the merits of the rulemaking and the GEIS, a State representative questioned whether the proposed approach provides cost and timeliness benefits. He thinks there might actually be a negative effect.

Concern: ALT.003
Commenter: Sutton

Comment: W11.050
Page: 48–52

Subtopic: State/NRC agreement
Org: Yankee Atomic Electric Company

A utility representative disagreed with State representatives that the alternatives issue should be Category 3. He noted that the entire process would benefit if some innovative, constructive way could be found for a utility to take credit for the State assessment of the need for the plant. The Public Utility Commission has veto power over allowing a utility to incorporate the costs of operation in its rate base. Public interest is not being served by constantly moving from one forum to another and just dragging these issues out.

Concern: ALT.002
Commenter: McCarthy

Comment: W11.051
Page: 53

Subtopic: State's responsibilities
Org: Minnesota Department of Public Service

A State representative expressed concern that the State agencies are being preempted from exercising their jurisdictional responsibilities. There is a strong need to put in writing whether the issue (of alternatives) "will or will not affect" how States do their business. If the issue affects the States, then the effect should also be clearly stated.

Concern: ALT.002
Commenter: Jenkins
Comment: W11.052
Page: 53–54
Subtopic: State's responsibilities
Org: Public Service Commission of Wisconsin

A State representative also shared the concern about preemption. She pointed to past experience on gas pipelines where a license was granted without public input. She further explained that the concern is more procedural in nature since Wisconsin's NEPA process is more open to the public than the NRC's NEPA process.

Concern: SWM.008
Commenter: Sherman
Comment: W11.053
Page: 79–81
Subtopic: Spent fuel and LLW
Org: Vermont Department of Public Service

A State representative asked whether it was intended that Table S-3 be used as the method by which the impact of the disposal of 20 years of additional spent fuel and LLW waste is evaluated, or is the statement on page 4-110 of the GEIS, "No radiological environmental impact is expected from such disposal," meant to be a complete evaluation of the additional waste generated.

Concern: NRR.007
Commenter: Volpenheim
Comment: W11.054
Page: 57
Subtopic: Categorization of issues
Org: Dames and Moore

A consulting firm representative asked the panel members if they believe that environmental issues are a major cost factor in the generation costs of the license renewal option and, if so, how should they be considered.

Concern: NONE
Commenter: Layton
Comment: W11.055
Page: 60–61
Subtopic: Supportive statement
Org: Toledo Edison

A utility representative supported the approach of requiring an economic threshold analysis as part of the license renewal application. By making this Category 1, the quality of the review of important issues or of issues better dealt with by the NRC will be improved.

Concern: ALT.020
Commenter: McCarthy
Comment: W11.056
Page: 62
Subtopic: Geothermal power
Org: Minnesota Department of Public Service

In response to a discussion on geothermal power, a State representative suggested that the pending reauthorization of the Resource Conservation and Recovery Act (RCRA) be considered in the GEIS since this might have an effect on the reinjection of waste effluents back into the ground.

Concern: ALT.011 **Comment:** W11.057 **Subtopic:** Comparison of alternatives
Commenter: Harvey **Page:** 64 **Org:** New York State Department of Environmental Conservation

A State representative noted that the license renewal alternative should have been compared to a mix of alternatives, and not the one-to-one comparison done in the GEIS.

Concern: ALT.017 **Comment:** W11.058 **Subtopic:** Biomass energy/Categorization
Commenter: Harvey **Page:** 64 **Org:** New York State Department of Environmental Conservation

A State representative suggested that biomass be considered as an alternative source.

Concern: ALT.006 **Comment:** W11.059 **Subtopic:** Economic analysis-fuel production and waste disposal
Commenter: Harvey **Page:** 65 **Org:** New York State Department of Environmental Conservation

A State representative observed that he did not find data on the amounts of energy used in the nuclear fuel cycle.

Concern: ALT.006 **Comment:** W11.060 **Subtopic:** Economic analysis-fuel production and waste disposal
Commenter: McCarthy. **Page:** 67 **Org:** Minnesota Department of Public Service

A State representative suggested that the analysis of the GEIS comparisons should identify hidden subsidies for both fuel production and waste disposal.

Concern: ALT.026 **Comment:** W11.061 **Subtopic:** Wind power
Commenter: Stancavage **Page:** 67 **Org:** General Electric Company

A utility representative suggested that the synthesized wind data (1977 data) presented in Figure 9.1 be updated since there is a 1988 version of the map.

Concern: ALT.024 **Comment:** W11.062 **Subtopic:** Pumped hydro
Commenter: Stancavage **Page:** 67–68 **Org:** General Electric Company

A utility representative noted that pumped hydro offers a significant energy storage capacity, but is not mentioned in the document. There are about 35 plants in the U.S. with pumped hydro storage at about 17,000 MW of capacity.

Concern: ALT.027 **Comment:** W11.063 **Subtopic:** Compressed air
Commenter: Stancavage **Page:** 68 **Org:** General Electric Company

A utility representative pointed out that compressed air is also maturing as an energy storage technology. The first plant (110 MWe with 26-hour capacity) is being operated by the Alabama Electric Cooperative.

Concern: ALT.025 **Comment:** W11.064 **Subtopic:** Solar energy
Commenter: Stancavage **Page:** 68 **Org:** General Electric Company

A utility representative noted, with regard to solar power, that heliostats and receivers are the only ones discussed in Section 9.3.32. Heliostats and receivers are typically only used for central station solar thermal plants. The most commonly used system uses lined focusing troughs.

Concern: ALT.026 **Comment:** W11.065 **Subtopic:** Wind power
Commenter: Stancavage **Page:** 68 **Org:** General Electric Company

A utility representative observed that the land that is most likely to be used for wind generation is agricultural. This is not undisturbed land, so the environmental impact could change.

Concern: ALT.026 **Comment:** W11.066 **Subtopic:** Wind power
Commenter: Stancavage **Page:** 68–69 **Org:** General Electric Company

A utility representative noted that the GEIS states that the wind turbines are spread over a large area to mitigate agricultural and economic losses or to provide for multiple land use. However, the real reason is to minimize turbulence and maximize energy capture, not because of land use.

Concern: ALT.024 **Comment:** W11.067 **Subtopic:** Pumped hydro
Commenter: McCarthy **Page:** 69 **Org:** Minnesota Department of Public Service

A State representative suggested that, if pumped hydro is considered, the assessment of environmental impacts should include the power purchased to pump the water up the hill and the emissions based on the amount of consumed energy.

Concern: ALT.026 **Comment:** W11.068 **Subtopic:** Wind power
Commenter: McCarthy **Page:** 69 **Org:** Minnesota Department of Public Service

A State representative suggested that the assessment of the environmental impact of wind power should consider its placement, similar to that used for placing power lines and pipelines. There is actually very little lost land; in fact it is almost negligible in many cases. There are some cases where there could be windbreak benefits from taking some of the energy out of low wind.

Concern: NONE
Commenter: Brown
Comment: W11.069
Page: 69
Subtopic: Supportive statement
Org: University of Massachusetts Lowell/ Committee for a Constructive Tomorrow

A public interest group representative agreed with the GEIS conclusion stating that the need for new construction is obviated and there is no impact.

Concern: ALT.005
Commenter: Sherman
Comment: W11.070
Page: 70
Subtopic: Economic analysis-waste storage and disposal
Org: Vermont Department of Public Service

A State representative pointed out that the additional volumes of LLW are really not identified in the report. Also, the costs that might be associated with disposing of LLW and HLW are imbedded within the O&M costs, but it is not clear how those O&M costs accommodate what will be the future costs of LLW and HLW storage and disposal.

Concern: ALT.013
Commenter: Sherman
Comment: W11.071
Page: 71
Subtopic: Comparison of impacts
Org: Vermont Department of Public Service

A State representative pointed out that there is an uneven method of comparing the impacts of alternative sources (e.g., biomass or natural gas) with the impacts from license renewal. The real impacts from license renewal, which for the most part are additional HLW and LLW, are obscured by having to look through voluminous processes like Table S-3 and the waste confidence hearing. A direct comparison should be made, i.e., whether it is worse to have 20 more years of HLW and LLW as compared with wood or natural gas emissions.

Concern: ALT.012
Commenter: McCarthy
Comment: W11.072
Page: 75
Subtopic: Comparison of alternatives
Org: Minnesota Department of Public Service

A State representative noted that health effects from onsite storage could occur over a longer period than officially reflected in Federal documents. A comparison of alternatives that does not take this into consideration is seriously inadequate.

Concern: ALT.005
Commenter: McCarthy
Comment: W11.073
Page: 75
Subtopic: Economic analysis-waste storage and disposal
Org: Minnesota Department of Public Service

A State representative pointed out that the cost data do not reflect the disposal of waste or additional interim storage costs. This might be perceived by some parties as a biased comparison.

Concern: ALT.028	**Comment:** W11.074	**Subtopic:** Impacts of license renewal
Commenter: Calaban	**Page:** 76	**Org:** New York State Department of Environmental Conservation

A State representative observed that the relicensing process and the additional 20 years of plant operation provides an opportunity to look at new mitigative technologies (in terms of their importance as well as practicality). For plants that are undergoing refurbishment, it's more practical now that costs can be borne effectively over the additional operating life of the plant, particularly if there are significant impacts. If a plant is going to be operating for an extended period of time, there seems to be a bigger responsibility to ensure that significant impacts are addressed over the 20 or 30 years of extended operation; this could warrant the additional capital expenditures.

Concern: NONE	**Comment:** W12.001	**Subtopic:** Supportive statement
Commenter: Swartz	**Page:** 11	**Org:** Council on Environmental Quality

A Federal agency representative commented that NRC staff should be commended for their effort. The CEQ appreciates the NRC's early and frequent coordination with them. The CEQ regulations implementing the provisions of NEPA encourage development of a GEIS. One CEQ regulation encourages agencies to tier their EISs from broad programmatic statements to specific issues as the NRC has done.

Concern: NEP.001	**Comment:** W12.002	**Subtopic:** Purpose or use of GEIS
Commenter: Swartz	**Page:** 12–14; 29–30	**Org:** Council on Environmental Quality

A Federal agency representative raised the following related concerns about the purpose or use of the GEIS:

1) Whether the GEIS was going to be used to support relicensing or the new rule. If it is to set a rule determining the information that needs reviewing for relicensing decisions and not to be a tiering document for site-specific EISs or environmental assessments (EAs), then its use is appropriate. If it is used as a tiering document, it would not be resolving anything because environmental impacts cannot be determined to be acceptable until a specific application is reviewed and all the impacts are looked at cumulatively.

2) Clarify why the *Federal Register* notice states that the purpose of the GEIS is to resolve NEPA issues since the purpose of NEPA is to disclose issues and impacts to the public and the decision makers. The GEIS should be viewed as an ongoing process where all issues in the GEIS are addressed on a site-specific basis for the following reasons:

   a) There may be cumulative impacts that are not acceptable.
   b) Some mitigation measures may be needed.
   c) It is inappropriate to declare issues solved and then later take an opposing point of view on these issues.

Concern: NONE
Commenter: Axelrad
Comment: W12.003
Page: 15
Subtopic: Supportive statement
Org: Newman & Holtinzger

A lawyer stated that the NRC has done an admirable job of collecting infomation and documenting this approach. Moreover, affording broad latitude in using generic rulemaking to address NEPA issues, as the NRC has done here, has been upheld in a number of court decisions, and is supported and endorsed by CEQ guidelines. He does not view the NRC consideration of NEPA issues as an attempt to avoid the consideration of issues by splitting a big problem into two smaller problems.

Concern: NONE
Commenter: Kvalseth
Comment: W12.004
Page: 17
Subtopic: Supportive statement
Org: Minnesota Department of Public Service

A State representative agrees that the NRC can tier EISs from broad programmatic statements to specific issues. (See Comment W12.001.)

Concern: NEP.001
Commenter: Kvalseth
Comment: W12.005
Page: 17–18
Subtopic: Purpose or use of GEIS
Org: Minnesota Department of Public Service

A State representative pointed out that the States are concerned that generic issues seem to be permanently decided and will not be reanalyzed on a site-specific basis for changes or differences from the GEIS analysis and that, in a sense, this process disallows public participation when it is needed.

Concern: NEP.007
Commenter: Kvalseth
Comment: W12.006
Page: 18
Subtopic: Cumulative impacts
Org: Minnesota Department of Public Service

A State representative voiced concern that there may be significant cumulative impacts from individually insignificant issues that are being overlooked. Moreover, no conclusions regarding cumulative impacts were found in the GEIS.

Concern: NONE
Commenter: Bishop
Comment: W12.007
Page: 19
Subtopic: Supportive statement
Org: Nuclear Management and Resources Council

An industry representative believes that what the NRC has proposed is within its statutory authority, that NEPA allows generic issues to be resolved generically, and that the GEIS includes a mechanism whereby the conclusions can be reanalyzed.

Concern: NEP.001	**Comment:** W12.008	**Subtopic:** Purpose or use of GEIS
Commenter: Jenkins	**Page:** 21–22	**Org:** Public Service Commission of Wisconsin

A State representative pointed out that the purpose of an EIS is to disclose impacts to the public and the decision makers. A conclusion may be reached that the disclosure is complete and adequate, but that is different from resolving an issue. The NRC should clarify that agreeing that the disclosure is complete and adequate is different from resolving an issue.

Concern: NONE	**Comment:** W12.009	**Subtopic:** Supportive statement
Commenter: Bishop	**Page:** 24	**Org:** Nuclear Management and Resources Council

An industry representative advocated an alternative to setting a specific term for periodic assessments: that the NRC review its analysis as new information pertinent to its decision as license renewals arise. This is what the NRC currently does for 10 CFR Part 50 and all other parts of Title 10.

Concern: NEP.006	**Comment:** W12.010	**Subtopic:** Periodic assessments
Commenter: Marshall	**Page:** 24	**Org:** U.S. Environmental Protection Agency

A Federal agency representative pointed out that the NEPA regulations call for periodic assessments. He went on to question whether it is more useful to pick a specific time for periodic assessments or to go along with the current commitment, which is to periodically review the findings in the generic EIS, or at least in Appendix B.

Concern: NEP.006	**Comment:** W12.011	**Subtopic:** Periodic assessments
Commenter: Swartz	**Page:** 24–26	**Org:** Council on Environmental Quality

A Federal agency representative believes it would be a good idea to review the validity of the assumptions in the GEIS at a specific point in time, but not sunset it, in order to ensure periodic review to ascertain the correctness of assumptions; otherwise it might be overcome by events with specific deadlines.

Concern: NONE	**Comment:** W12.012	**Subtopic:** Supportive statement
Commenter: Axelrad	**Page:** 25	**Org:** Newman & Holtinzger

A lawyer commented that the NRC has committed to periodic review. It is not necessary to set a specific date for periodic review because the NRC operates so much in the open and is subject to very careful scrutiny by a large segment of the public.

Concern: NONE	**Comment:** W12.013	**Subtopic:** Supportive statement
Commenter: Swartz	**Page:** 28	**Org:** Council on Environmental Quality

A Federal agency representative stated that the NRC has done a very good job of pulling in the CEQ, other Federal agencies, and the public in this effort. Everything the NRC has done is fine with them.

Concern: NEP.003	**Comment:** W12.014	**Subtopic:** NRC/State review procedure
Commenter: Marshall	**Page:** 19; 31; 34	**Org:** U.S. Environmental Protection Agency

A Federal agency representative asked that the following details or the procedures to be followed be clarified in order to comply with 10 CFR Part 51 and NEPA: 1) the infomation that would have to be addressed by the NRC staff in an individual license renewal proceeding; 2) the relationship of the environmental report or resulting NEPA document to the GEIS; and 3) how the GEIS findings would be explicitly incorporated into or tied to the site-specific NEPA document thereby providing a "tight as a drum" scheme.

Concern: NEP.004	**Comment:** W12.015	**Subtopic:** NRC/State review procedure
Commenter: Marshall	**Page:** 34–36	**Org:** U.S. Environmental Protection Agency

A Federal agency representative asked for clarification on how the cost-benefit determination would affect whether an EA or an EIS was prepared. At licensing, the question would be raised of possible significant impacts on the environment. An analysis that documents a finding of no significant impact (FONSI) would be prepared or a decision might be reached to prepare an EIS. The relevance of the cost-benefit analysis to this question on a NEPA determination needs clarification. If, for example, there was the possibility of an adverse impact on a threatened and endangered species, that might raise an EIS-level question which appears to be independent of any cost-benefit analysis.

Concern: NEP.005	**Comment:** W12.016	**Subtopic:** Public participation/ site-specific EISs
Commenter: Kvalseth	**Page:** 39	**Org:** Minnesota Department of Public Service

A State representative voiced concern about an EIS updating document being in the form of an EA vs. an EIS for the following reasons. It appears that for an EA, there is no notice to the public and no opportunity to comment. Likewise, once the EA has been done, a FONSI can be issued, but, again, there is no opportunity for comment unless it happens to be a draft. So, this whole process could be decided without public input whereas, when you use the EIS, public comment is specifically requested.

Concern: NEP.005	**Comment:** W12.017	**Subtopic:** Public participation/ site-specific EISs
Commenter: Jenkins	**Page:** 41	**Org:** Public Service Commission of Wisconsin

A State representative is concerned that public comment will be limited to Category 2 or 3 issues. States have expressed concern about several Category 1 issues that might undergo substantial change over the next several years.

Concern: NEP.005	**Comment:** W12.018	**Subtopic:** Public participation/ site-specific EISs
Commenter: Swartz	**Page:** 42	**Org:** Council on Environmental Quality

A Federal agency representative wanted to know what mechanisms were available to revise the GEIS (if site analyses do not match the GEIS results) other than a petition to amend the rules, which they characterized as a very long, complicated process.

Concern: NEP.005	**Comment:** W12.019	**Subtopic:** Public participation/site-specific EISs
Commenter: Marshall	**Page:** 44	**Org:** U.S. Environmental Protection Agency

A Federal agency representative requested clarification, in the *Federal Register* notice, of the public's opportunity to submit a petition to amend the rules or to consider an application of the rule pursuant to 10 CFR 2.758 or 10 CFR 2.206.

Concern: NEP.003	**Comment:** W12.020	**Subtopic:** NRC/State review procedure
Commenter: Jenkins	**Page:** 22	**Org:** Public Service Commission of Wisconsin

A State representative asked how the NRC and State environmental reviews fit together. The NEPA allows for coordinated efforts, but it is not clear that those occur.

Concern: NEP.007	**Comment:** W12.021	**Subtopic:** Cumulative impacts
Commenter: Swartz	**Page:** 47	**Org:** Council on Environmental Quality

A Federal agency representative pointed out that, if plant operations are continuing, the impact of the plant itself might be insignificant; however, when added to other reasonably foreseeable impacts in the surrounding area, those impacts may become significant.

Concern: ALT.021
Commenter: Sherman

Comment: W12.022
Page: 48, 50

Subtopic: Imported power
Org: Vermont Department of Public Service

Regarding the purchase of power from Canada, a State representative asked about the NRC's authority or responsibility under NEPA to evaluate the environmental impacts of such an alternative, and what legal ramifications, if any, could occur.

Concern: NGC.004
Commenter: Bishop

Comment: W12.023
Page: 49

Subtopic: State participation
Org: Nuclear Management and Resources Council

An industry representative believes that it has been a longstanding serious mistake for the NRC to assume responsibility in evaluating load forecasts, demand reduction scenarios, and the development of alternate power sources, in addition to ensuring adequate protection of public health and safety. The NRC may not have the same degree of expertise in these areas.

Concern: ALT.001
Commenter: Kvalseth

Comment: W12.024
Page: 51–52

Subtopic: Categorization of issues
Org: Minnesota Department of Public Service

A State representative pointed out that the alternatives issue appears to be Category 2 because of the requirement to perfom an economic threshold analysis. It is confusing to designate it as Category 1, yet include the condition that an economic threshold analysis be perfomed.

Concern: ALT.002
Commenter: Bishop

Comment: W12.025
Page: 53–54

Subtopic: State's responsibilities
Org: Nuclear Management and Resources Council

An industry representative does not believe that NEPA requires a determination of the least-cost source of power. The decision about the right source of power is the responsibility of the States, not the NRC. It is not the NRC's responsibility to determine which factors will be considered in the decision although cost will presumably be included. Moreover, the analysis of the alternatives should be done at the time when a specific license renewal decision is being made and will depend on the alternatives at that particular point in time.

Concern: NGC.004
Commenter: Kvalseth

Comment: W12.026
Page: 56

Subtopic: State participation
Org: Minnesota Department of Public Service

A State representative believes that the NRC's purview is health and safety, not considerations of alternatives and costs. Moreover, the States are troubled by the NRC's getting into these areas because they feel that this is a State's prerogative.

Concern: NEP.004	**Comment:** W12.027	**Subtopic:** NRC/State review procedure
Commenter: Bishop	**Page:** 56	**Org:** Nuclear Management and Resources Council

An industry representative asked if it is correct that the words "cost-benefit" do not appear in the NEPA at all.

Concern: GIS.012	**Comment:** W12.028	**Subtopic:** Cost-benefit analysis
Commenter: Swartz	**Page:** 57	**Org:** Council on Environmental Quality

A Federal agency representative questioned what seemed to be a determination on the alternatives issue that is based solely on costs. NEPA requires that the decision be based on factors other than costs. Even if it is treated solely as a cost question, there are environmental costs and benefits that need to be factored into the equation, such as waste, excessive carbon dioxide in the air, and global warming.

Concern: GIS.012	**Comment:** W12.029	**Subtopic:** Cost-benefit analysis
Commenter: Kvalseth	**Page:** 61	**Org:** Minnesota Department of Public Health

A State representative noted that when the NRC did the economic comparison of coal versus nuclear power plants, it did not take into account the environmental externalities that people are concerned about. Were those costs considered, they might have made a difference in the economic analysis.

Concern: ALT.002	**Comment:** W12.030	**Subtopic:** State's responsibilities
Commenter: Kvalseth	**Page:** 64	**Org:** Minnesota Department of Public Service

A State representative was concerned that the NRC's consideration of the alternatives issue is outside the NRC's prerogative, i.e., health and safety considerations, and that the State's role is being preempted in order to solve problems at the Federal level.

Concern: NEP.002	**Comment:** W12.031	**Subtopic:** Regulatory responsibility
Commenter: Morrow	**Page:** 65; 78	**Org:** Sanford Cohen and Associates

A consulting firm representative asked if mixed waste, at least the hazardous waste part of it, is under the authority of RCRA and whether the NRC, through the GEIS, has the authority to dispose of an issue as Category 1 that is under the regulatory authority of the States. Moreover, this question would also apply to airborne emissions under the National Emission Standards for Hazardous Air Pollutants System and aquatic emissions under the CWA. Also, in a formal EA proceeding on a site-specific application, it would be difficult for the public to address RCRA issues associated with mixed waste because of the Category 1 ranking. Under the present approach, a fairly formal proceeding with its own protocol would be required.

Concern: NEP.007
Commenter: de Pass

Comment: W12.032
Page: 68

Subtopic: Cumulative impacts
Org: Consolidated Edison Company of New York

A utility representative asked how individual license renewal applicants will be permitted to demonstrate, for NEPA purposes, that the balancing of the overall environmental impacts is positive if the focus is primarily or entirely on Category 2 or 3 issues. He pointed out that NEPA requires an overall balancing or weighing of the environmental impacts of a proposed Federal action. The NRC's approach relegates to Categories 2 and 3 those issues which may have significant environmental disadvantages.

Concern: NEP.007
Commenter: Swartz

Comment: W12.033
Page: 69; 72; 73

Subtopic: Cumulative impacts
Org: Council on Environmental Quality

A Federal agency representative is concerned that Category 1 issues are not included in any cumulative impact analysis, and there appears to be no mention of how cumulative impacts were addressed in the GEIS. If the Category 1 impacts are viewed as individually and cumulatively insignificant, that needs to be stated. Also, it should be considered that the cumulative impacts of Category 1, 2, and 3 issues might not be acceptable; however, this will not be known if the Category 1 issues are not addressed.

Concern: NEP.007
Commenter: Marshall

Comment: W12.034
Page: 70; 72

Subtopic: Cumulative impacts
Org: U.S. Environmental Protection Agency

A Federal agency representative wants an explanation of the procedure for combining previously considered issues, e.g., Category 1 issues, with those to be addressed in an individual license renewal proceeding. An explanation of how the NRC addressed the cumulative impacts and how the process of determining the cumulative effects of Category 1, 2, and 3 issues will be documented would greatly support the approach. Then, in the licensing process, the NRC would be looking at new information and reassessing, as appropriate, the GEIS findings.

Concern: NEP.007
Commenter: Bishop

Comment: W12.035
Page: 71

Subtopic: Cumulative impacts
Org: Nuclear Management and Resources Council

An industry representative queried whether the GEIS concludes that, individually, all the Category 1 impacts are small and that, cumulatively, their impact is acceptable in terms of license renewal.

Concern: NONE	**Comment:** W12.036	**Subtopic:** Public participation
Commenter: Marshall	**Page:** 76	**Org:** U.S. Environmental Protection Agency

Related to taking a broad look at Category 1, 2, and 3 individual and cumulative impacts, a Federal agency representative suggested that involving the public might help the process of arriving at a consensus on an acceptable conclusion or determination.

Concern: NEP.006	**Comment:** W12.037	**Subtopic:** Periodic assessments
Commenter: Kvalseth	**Page:** 84	**Org:** Minnesota Department of Public Service

A State representative inquired whether a specific time period will be designated for the consideration of new infomation.

Concern: SOE.007	**Comment:** W12.038	**Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Marshall	**Page:** 85	**Org:** U.S. Environmental Protection Agency

A Federal agency representative pointed out that the National Historic Preservation Act is similar to the Endangered Species Act (ESA) and historic preservation is an area of site-specific concern, as endangered species may be, instead of an issue to be generically resolved.

Concern: SOE.007	**Comment:** W12.039	**Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Jenkins	**Page:** 86	**Org:** Public Service Commission of Wisconsin

A State representative is concerned that the GEIS does not say anything about archeological resources. In particular, there is nothing in the GEIS to protect a site in the event of additional construction during refurbishment, even if the utility had originally identified archeological resources on their site.

Concern: TEL.003	**Comment:** W12.040	**Subtopic:** Threatened & endangered species
Commenter: Marshall	**Page:** 88	**Org:** U.S. Environmental Protection Agency

A Federal agency representative pointed out that the ESA requires Federal agencies to avoid the likelihood of jeopardizing already-listed threatened or endangered species. In addition, it requires that agencies confer over candidate species, i.e., those species that have been proposed for listing. The endangered species provisions in the GEIS should include proposed species in addition to already threatened and endangered species.

Concern: TEL.008 **Comment:** W12.041 **Subtopic:** Transmission lines
Commenter: Jenkins **Page:** 89 **Org:** Public Service Commission of Wisconsin

A State representative is concerned that the discussion on transmission lines on page 3-4, of the GEIS, indicates that there is no offsite power line modifications expected as part of relicensing. Since they are working on several cases where 60-year old lines on wooden poles are in precarious condition, the GEIS should address the expected lifetime of transmission lines through to the end of the 20-year relicensing period, or for a total of 60 years.

Concern: GIS.003 **Comment:** W12.042 **Subtopic:** Substantiation of conclusions-documentation
Commenter: Klotz **Page:** 91 **Org:** Gannett Fleming, Inc.

An engineering services representative recommended that all the literature used in the GEIS be cited. He found that sometimes the conclusions reached in Chapter 4 of the GEIS were not substantiated and it was difficult to determine whether the conclusions were valid since all the literature was not cited in all cases. Similarly, letters relating to aquatic ecology that were sent out to nuclear power plants or to companies that run those plants and the responses to those letters should be included in the appendix of the GEIS for reference purposes.

Concern: NEP.001 **Comment:** W12.043 **Subtopic:** Purpose or use of GEIS
Commenter: McCarthy **Page:** See Note **Org:** Minnesota Department of Public Service

A State representative asked whether the NRC would consider declaring the GEIS as a NEPA "tiering" document for use as a reference and for case-specific decision making.

Concern: GIS.012 **Comment:** W12.044 **Subtopic:** Cost-benefit analysis
Commenter: Kvalseth **Page:** 55 **Org:** Minnesota Department of Public Service

A State representative believes that the NRC has not considered enough costs in the cost-benefit analysis. In order to conduct a cost-benefit analyses, environmental externalities and social costs must be considered. If, for example, waste costs increase dramatically, this could have a huge impact on the anticipated benefit.

B-2. Summary of Written Comments on the Proposed Rule (56 FR 47016)

Concern: GIS.007 **Comment:** 001.001 **Subtopic:** Cost-benefit analysis
Commenter: Sokolov **Page:** 1 **Org:** Individual

A private citizen disagrees with the NRC's statement that "subject to certain conditions, the renewal of a nuclear power plant operating license for up to a single period of 20 years would have accrued benefits that outweigh the economic, environmental, and social costs." She believes that this statement is not quantitatively supportable. (This statement is found in 56 FR 47016, Section III, Part A).

Concern: ALT.030 **Comment:** 001.002 **Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sokolov **Page:** 1 **Org:** Individual

A private citizen disagrees with the NRC's conclusion that there is a need for generating capacity. She believes that energy needs can be met through conservation and increases in energy efficiency, rather than through nuclear power.

Concern: NRR.001 **Comment:** 001.003 **Subtopic:** Waste disposal
Commenter: Sokolov **Page:** 2 **Org:** Individual

A private citizen believes that there should be more emphasis on low-level radioactive waste (LLW) disposal. This should include making the public aware of the environmental cost of nuclear power, i.e., waste disposal. People have to understand that "if they don't want the waste, they can't have the power." Furthermore, no plant relicensing should be approved until disposal facilities are on-line.

Concern: NEP.011 **Comment:** 001.004 **Subtopic:** Proposed rule evaluation
Commenter: Sokolov **Page:** 3 **Org:** Individual

A private citizen suggested that an impartial panel review the results of the proposed Part 51 rule listed in Table B-1 of the *Federal Register* (56 FR 47016). She suggested that the panel include NRC representatives as well as representatives from environmental and public interest groups.

Concern: POA.032 **Comment:** 001.005 **Subtopic:** Substantiation of conclusions
Commenter: Sokolov **Page:** 1 **Org:** Individual

A private citizen commented that the NRC's characterization that a Chernobyl-type accident could not happen here is not realistic. She noted that it would be more accurate to describe severe accidents as "low probability, high consequence" risk, which is entirely different from the NRC's characterization as low risk, small cost.

Docket Number: 002

Concern: NONE	**Comment:** 002.001	**Subtopic:** Supportive statement
Commenter: Badger	**Page:** 1	**Org:** State of Georgia

A State agency commented that their review of the GEIS indicates that its content is consistent with the State's policies and objectives.

Docket Number: 003

Concern: FRN.001	**Comment:** 003.001	**Subtopic:** Comment period
Commenter: Stewart-Smith	**Page:** 1	**Org:** Oregon Department of Energy

A State agency representative requested that the comment period be extended until March 16, 1992. This would provide ample time to encourage others in the State to comment on the proposed rule.

Docket Number: 004

Concern: NONE	**Comment:** 004.001	**Subtopic:** None
Commenter: Adams	**Page:** 1	**Org:** State of Texas

A State agency reviewed the GEIS and had no substantive comments.

Docket Number: 005

Concern: NRR.003	**Comment:** 005.001	**Subtopic:** Application timing
Commenter: Lewis	**Page:** 1	**Org:** Individual

A private citizen questioned the need for a license renewal rule in 1992, since there are no nuclear reactors petitioning for renewal at this time. He believes the proposed Part 51 rulemaking is better left to the future, when a database of experience will be available to help the NRC. He also questioned whether there was a hidden agenda behind this rush for license renewal.

Concern: FRN.001 **Comment:** 005.002 **Subtopic:** Comment period
Commenter: Lewis **Page:** 1 **Org:** Individual

A private citizen requested that the comment period for the proposed rule be extended because the time restraints for commenting are short and because lack of action on this rule will not affect operating licenses.

Concern: NGC.012 **Comment:** 005.003 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Lewis **Page:** 1 **Org:** Individual

A private citizen disagrees with the GEIS conclusion that license renewal will meet the needs for generating capacity. He believes that license renewal does not guarantee generating capacity. For example, Yankee Rowe stopped operating after applying to the NRC for a license extension, thus causing a loss of generating capacity. Furthermore, he believes this stoppage would have happened even if a license renewal had been granted.

Concern: NGC.014 **Comment:** 005.004 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Lewis **Page:** 2 **Org:** Individual

A private citizen noted that the analysis of the benefit from license renewal is based on the assumptions in 10 CFR 51.53 and 51.95 that eliminate the requirement for nuclear reactors to consider need for power and alternative energy sources at the operating license stage. He believes we are looking at the "operating license renewal stage" and not the "operating license stage" and these items bear consideration. Additionally, he believes license renewal would not have such a large benefit if sources, other than construction and operation of new (nuclear reactor) generating facilities, were added into the need for generating capacity decision.

Concern: ALT.016 **Comment:** 005.005 **Subtopic:** Demand side management
Commenter: Lewis **Page:** 2 **Org:** Individual

A private citizen disagrees with the GEIS conclusion that alternatives to license renewal are not preferable to license renewal. He believes that alternatives to license renewal provide very large benefits such as demand side management (DSM) which has obviated the need for several reactors in the Sacramento Municipal Utility District. Additionally, he believes alternatives provide substantial savings which overwhelm any predicted savings from refurbishment and license renewal.

Concern: ALT.018 **Comment:** 005.006 **Subtopic:** Coal impacts
Commenter: Lewis **Page:** 3 **Org:** Individual

A private citizen disagrees with the NRC's claim that nuclear power is clean compared to coal. High sulfur coal used in the uranium enrichment process minimizes this claim. He noted that an estimated 25 percent of the electricity produced by a nuclear power plant is consumed by the enrichment process. Therefore, nuclear power currently produces twice the acid rain emissions on a kilowatt-hour basis, than does a new coal-fired plant with scrubbers that are 90 percent effective. After phase 1 of the Clean Air Act (CAA), nuclear power will still cause about as much acid rain as a new coal-fired plant with scrubbers. He requests that the NRC explore and evaluate the impact of nonradioactive air emissions upon the renewal of operating licenses from the viewpoint of enriching uranium fuel. He believes that since most of our uranium is mined and enriched outside of the United States, the impact will significantly affect the citizens of our trading partners, i.e., Russia and the Union of South Africa.

Concern: ALT.018 **Comment:** 005.007 **Subtopic:** Coal impacts
Commenter: Lewis **Page:** 3 **Org:** Individual

Item has been incorporated into comment 005.006.

Concern: POA.011 **Comment:** 005.008 **Subtopic:** SAMDAs
Commenter: Lewis **Page:** 4 **Org:** Individual

A private citizen responded to question 3 on page 47025 of the *Federal Register* notice in relation to the GEIS assumption that severe accident mitigation design alternatives (SAMDAs) do not need to be considered in individual plant licenses. SAMDAs are dealt with through a policy statement which does not represent the requisite careful consideration of the environmental consequences. The individual cited the decision in *Limerick Ecology Action, Inc. vs. USNRC*, which remanded the case to the NRC for consideration of SAMDAs. He believes that avoiding SAMDAs by citing rulemakings is improper and that SAMDAs should be properly evaluated to protect the public health and safety.

Docket Number: 006

Concern: NRR.002 **Comment:** 006.001 **Subtopic:** GEIS approach
Commenter: Dean **Page:** 1 **Org:** Governor, State of Vermont

A State governor disagrees with the GEIS approach to generically resolve numerous issues of great importance to and impact on the States. Some of these issues are forecasted power demand, power supply alternatives, and disposal of radioactive wastes. Additionally, he believes the proposed Part 51 rule will stifle public participation and abridge the public process regarding license renewal. Also, the resolution of license renewal issues by this rule would make it difficult or impossible to raise these issues when specific plants apply for license renewal. Furthermore, power market and nuclear disposal issues are likely to be State or region specific.

Concern: NRR.003 **Comment:** 006.002 **Subtopic:** Application timing
Commenter: Dean **Page:** 1 **Org:** Governor, State of Vermont

A State governor believes that devoting public resources to license renewal reviews at this time would be premature given that many nuclear plants will not require license renewal for twenty or more years.

Concern: NRR.002 **Comment:** 006.003 **Subtopic:** GEIS approach
Commenter: Dean **Page:** 1 **Org:** Governor, State of Vermont

A State governor believes that the proposed Part 51 rule would abrogate the States' right to weigh the adverse environmental impacts of power supply alternatives, and choose among them. Specifically, the States' concerns in the areas of high-level radioactive waste (HLW) and LLW would never be addressed in license renewal. Most or all of the HLW produced to date resides in the States, and it is not clear that any other final disposal solution will ever be found. As for LLW, unless court challenges prevail, States can be forced to take title to the wastes within their boundaries starting in 1996.

Concern: ALT.011 **Comment:** 006.004 **Subtopic:** Comparison of alternatives
Commenter: Dean **Page:** 2 **Org:** Governor, State of Vermont

A State governor disagrees with the proposed Part 51 rule consideration of any electrical generating alternatives other than coal. This ignores alternatives available to different regions of the nation and proposes to usurp the States' decision making authority in this matter.

Concern: NRR.002 **Comment:** 006.005 **Subtopic:** GEIS approach
Commenter: Dean **Page:** 2 **Org:** Governor, State of Vermont

A State governor believes the proposed Part 51 rule should be withdrawn. Environmental reviews should be accomplished on a plant-specific basis with the State's preference followed regarding the radioactive waste issue!

Docket Number: 007

Concern: GIS.008 **Comment:** 007.001 **Subtopic:** Corrections
Commenter: Knotts/Ross **Page:** 1–2 **Org:** Winston & Strawn

A law firm representing an industry consortium indicated that it is incorrect to list the Carolina Virginia Tube Reactor (CVTR) as being "in SAFSTOR with continued license" in Table 7.1. Possession of the nuclear byproduct material associated with decommissioning of the reactor is regulated by the State of South Carolina through a South Carolina Radioactive Material License. Since there is no current NRC license in place for the CVTR, the commenter indicates that the

CVTR is not in SAFSTOR as defined in 10 CFR 50. Therefore, the commenter recommends that the reference to the CVTR be deleted from Table 7.1.

Docket Number: 008

Concern: GRW.001 **Comment:** 008.001 **Subtopic:** Monitoring system
Commenter: Weaver/Allen **Page:** 1–3 **Org:** Ohio State Clearinghouse/Ohio EPA Division of Groundwater

A State agency commented that additional requirements are necessary in the GEIS to protect groundwater quality and availability surrounding the site. Specifically, the commenter believes that a groundwater monitoring system should be required for each plant. The objectives of the program should be four-fold: (1) verify the productivity of the aquifer, (2) demonstrate groundwater dispersion effectiveness for contaminants in the event of a spill, (3) evaluate the stability of materials below the site, and (4) verify that adequate protection exists to prevent (primarily) cooling pond water from infiltrating the aquifer below the site.

Docket Number: 009

Concern: SOE.004 **Comment:** 009.001 **Subtopic:** Local infrastructure
Commenter: Brown **Page:** 1–2 **Org:** Iowa State Utilities Board

A State agency believes the proposed Part 51 rule does not address the worsening of local financial conditions. The agency believes that this scenario exists today and that Category 1 issues may easily become Category 2. The agency suggests that a better policy for the NRC may be to assess socioeconomic issues as Category 2, thereby the license applications will contain a contemporaneous analysis of local socioeconomic impacts, which will enable the NRC to make fully informed decisions about these license renewal applications.

Docket Number: 010

Concern: GIS.016 **Comment:** 010.001 **Subtopic:** Rulemaking & GEIS approach
Commenter: Papineau **Page:** 2 **Org:** NU-END

A public interest group said that the GEIS fails to address many types of site-specific impacts and regional effects.

Concern: POA.009 **Comment:** 010.002 **Subtopic:** Categorization of issues
Commenter: Papineau **Page:** 2–3 **Org:** NU-END

A public interest group believes that evacuation plans are inadequate and should be addressed as Category 3. Specific shortcomings include incorrect estimates of population density, inadequate corridor pathways, inadequate protection of ingestion pathways, inadequate reception pathways, faulty management of evacuation planning, and faulty alarm systems.

Concern: POA.009 **Comment:** 010.003 **Subtopic:** Categorization of issues
Commenter: Papineau **Page:** 2–3 **Org:** NU-END

A public interest group commented that the presence of three seismic faults in the Maine area requires that the risks of earthquake-induced damage be evaluated as Category 3.

Concern: SOE.012 **Comment:** 010.004 **Subtopic:** Transportation
Commenter: Papineau **Page:** 2–3 **Org:** NU-END

A public interest group noted that increases in housing and commercial development in the Maine Yankee area have resulted in critical traffic congestion during the summer tourist months.

Concern: GIS.016 **Comment:** 010.005 **Subtopic:** Rulemaking & GEIS approach
Commenter: Papineau **Page:** 3 **Org:** NU-END

A public interest group commented that the GEIS should include a Category 3 provision for assessment of each plant's operating history.

Concern: AQE.006 **Comment:** 010.006 **Subtopic:** Aquatic issues-impacts on aquatic systems
Commenter: Papineau **Page:** 4 **Org:** NU-END

A public interest group commented that there have been damaging effects of thermal changes in Montsweag Bay as a result of reactor discharge.

Concern: AQE.020 **Comment:** 010.007 **Subtopic:** Input on specific sites
Commenter: Papineau **Page:** 4 **Org:** NU-END

A public interest group commented that increased fecal pollution from power plant workers closed Montsweag Bay to the taking of shellfish for human consumption from 1971–1976.

Concern: AQE.020 **Comment:** 010.008 **Subtopic:** Input on specific sites
Commenter: Papineau **Page:** 4 **Org:** NU-END

A public interest group noted that there are claims of increased cancer and leukemia deaths to residents living nearby.

Concern: POA.008 **Comment:** 010.009 **Subtopic:** Analysis of issues
Commenter: Papineau **Page:** 4 **Org:** NU-END

A public interest group commented that the risk of a spent fuel accident is enhanced by the combination of operating an aged reactor and storing HLW at the same site.

Concern: POA.031 **Comment:** 010.010 **Subtopic:** Airplane crash
Commenter: Papineau **Page:** 4 **Org:** NU-END

A public interest group commented that aircraft emergencies, arising from two nearby airfields, may impact the Maine Yankee site.

Concern: POA.013 **Comment:** 010.011 **Subtopic:** Plant aging
Commenter: Papineau **Page:** 5 **Org:** NU-END

A public interest group pointed out that the public should have an opportunity to provide input on the problems of the Maine Yankee reactor, e.g., premature aging, advanced embrittlement, steam tube problems, ocean water corrosion, and increasing radiation levels to plant components and plant workers.

Docket Number: 011

Concern: POA.024 **Comment:** 011.001 **Subtopic:** Severe accidents
Commenter: Schmidt/Lipoti **Page:** 2 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency recommended that the findings of individual plant examinations (IPEs) be integrated into the environmental impact statement (EIS) for each plant.

Concern: NRR.002 **Comment:** 011.002 **Subtopic:** GEIS approach
Commenter: Schmidt/Lipoti **Page:** 3 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency pointed out that many of the Category 1 issues are plant-specific and should not be Category 1. Also, the generic resolution approach to improve the "efficiency of the process of

environmental review" is an unexamined process which neither benefits the NRC nor the utility, and certainly does not benefit the States.

Concern: NEP.007 **Comment:** 011.003 **Subtopic:** Cumulative impacts
Commenter: Schmidt/Lipoti **Page:** 3 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that while individual Category 1 issues may be considered to be generic or of small magnitude, the cumulative impact of a number of Category 1 issues may require a Category 2 or Category 3 rating.

Concern: NRR.004 **Comment:** 011.004 **Subtopic:** Studies and analysis
Commenter: Schmidt/Lipoti **Page:** 3 **Org:** New Jersey Department of Environmental Protection and Energy

In acknowledging the NRC's extension of the comment period, a State agency commented that this was necessary because more detailed study and evaluation is necessary to assess the completeness and accuracy of the conclusions of the GEIS.

Concern: HHI.010 **Comment:** 011.005 **Subtopic:** Electromagnetic fields impacts
Commenter: Schmidt/Lipoti **Page:** 4 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency pointed out that the chronic health effects of electromagnetic fields (EMFs), currently listed as Category 1, need to be treated as a site-specific issue.

Concern: HHI.008 **Comment:** 011.006 **Subtopic:** Public exposure
Commenter: Schmidt/Lipoti **Page:** 4 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency said that radiation exposure to the public, currently treated as Category 1, needs to be treated as a site-specific issue.

Concern: SWM.014 **Comment:** 011.007 **Subtopic:** Mixed waste
Commenter: Schmidt/Lipoti **Page:** 4 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency believes that the management of mixed waste requires more examination on a case-by-case basis.

Concern: SWM.009 **Comment:** 011.008 **Subtopic:** Spent fuel
Commenter: Schmidt/Lipoti **Page:** 4 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency believes that the management of spent fuel requires more site-specific examination. For New Jersey's Oyster Creek Plant, the additional 20 years of spent fuel stored in dry cask on the site will pose environmental, safety, and emergency planning problems.

Concern: SWM.047 **Comment:** 011.009 **Subtopic:** Transportation
Commenter: Schmidt/Lipoti **Page:** 5 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency believes that the increased transportation of radioactive waste resulting from refurbishment and the unknown increase in radioactive waste due to plant aging require more examination.

Concern: REG.001 **Comment:** 011.010 **Subtopic:** NUREG-1440-Analysis-approach, assumptions, and data
Commenter: Schmidt/Lipoti **Page:** 5 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency believes that many of the assumptions which form the basis for analyses in NUREG-1440 are unclear. The use of the words "upper bound" as a threshold for Category 2 determination is not clear. Does upper bound mean worst case or best estimate? Does upper bound mean a confidence level of 1, 2, or 3 sigma?

Concern: NRR.002 **Comment:** 011.011 **Subtopic:** GEIS approach
Commenter: Schmidt/Lipoti **Page:** 5 **Org:** New Jersey Dept of Environmental Protection and Energy

A State agency viewed the license renewal process as invalid.

Docket Number: 012

Concern: SOE.007 **Comment:** 012.001 **Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Bush **Page:** 1–2 **Org:** Advisory Council on Historic Preservation

A Federal agency disagreed with the GEIS analysis and conclusions on historic resources. First, it does not agree with the blanket statement in the GEIS that there are no impacts to historic resources. Second, even though in most cases, there is little or no effect to historic properties on or near nuclear power plants, each site must complete Section 106 of the National Historic

Preservation Act of 1966, a law separate and distinct from NEPA, and not satisfied through compliance with NEPA. The Act establishes historic resource preservation, levels of impacts for historic resources, and definitions for site, building, structure, or object included in, or eligible for inclusion in, the National Register [of Historic Places]. To assess the levels of impacts to historic resources, 36 CFR Part 800.5 and .9 should be used, which state that impacts may occur when an "undertaking may alter characteristics [location, setting, or use] of the property that may qualify the property for inclusion to the National Register . . . ." The agency pointed out that the assessment is arrived at through consultation with the appropriate State Historic Preservation Officer (SHPO) and is not dependent on public perceptions or complaints about the changed nature of historic resources.

Docket Number: 013

Concern: SOE.007	**Comment:** 013.001	**Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Strain et al.	**Page:** 2	**Org:** Oklahoma Archeological Survey for OK Department of Commerce

A State agency implied that the review of historic resources impacts is a State responsibility. If the refurbishment only involves modifications to existing structures, the State office probably will have no objection to the project, but the State archaeologist will refer it to the SHPO for review. If any part of the project requires earth-moving activities in previously undisturbed areas, the specific location will require a complete environmental review and evaluation.

Docket Number: 014

Concern: SWM.035	**Comment:** 014.001	**Subtopic:** Spent fuel/LLW
Commenter: Lattrell	**Page:** 1–2	**Org:** Deerfield River Compact

A regional agency recommends that "Federal legislation be filed to address the environmental review of the license renewal applications for nuclear plants" because the process proposed by the NRC eliminates public involvement in plant relicensing. The agency suggests that the legislation include (1) a site-specific EIS; (2) a cost-benefit analysis of the alternatives to license renewal, including conservation and load management, and consideration of all related costs of production; (3) incorporate the conclusions of any comprehensive resource management plans that have been adopted by the State; and (4) if no comprehensive plan exists, the license applicant should make available adequate funding to allow the State to develop such a plan. These recommendations are apparently prompted by the agency's concern about the large volume of spent fuel and LLW generated as a result of license renewal.

Docket Number: 015

Concern: SWM.036 **Comment:** 015.001 **Subtopic:** Spent fuel/LLW
Commenter: Lattrell **Page:** 1–2 **Org:** Deerfield River Compact

See Comment 014.001.

Docket Number: 016

Concern: SWM.036 **Comment:** 016.001 **Subtopic:** Spent fuel/LLW
Commenter: Lattrell **Page:** 1–2 **Org:** Deerfield River Compact

See Comment 014.001.

Docket Number: 017

Concern: SWM.018 **Comment:** 017.001 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Dewatering and evaporation should be included in the listing of onsite volume reduction (VR) techniques. (see p. 2-15, line 30 of GEIS).

Concern: SWM.018 **Comment:** 017.002 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter disagrees with the statement on page 2-15, line 34 of the GEIS that indicates that offsite waste management vendors "occasionally" undertake supercompaction since "much of the waste currently sent to disposal sites is supercompacted at the SEG facility prior to disposal."

Concern: SWM.018 **Comment:** 017.003 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter suggests that the discussion of mixed waste should indicate that the volume of such waste is a small fraction of the overall waste stream (see p. 2-22, line 38).

Concern: SWM.018 **Comment:** 017.004 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter suggests that additional wording be added to the last sentence (p. 2-23, line 4) as follows: ". . . States must secure their own disposal capacity for LLW generated within their boundaries after 1992 by forming waste compacts that are responsible for siting regional disposal facilities or by siting their own disposal facilities."

Concern: SWM.018 **Comment:** 017.005 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter suggests that the discussion of radiation exposure from radioactive material transportation should indicate the magnitude (extremely small) of the exposure, as was done in the previous sentence regarding worker exposure (see p. 2-23, line 10).

Concern: SWM.018 **Comment:** 017.006 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

GEIS Section 3.8.1.6 (p. 3-37) should at least recognize the likelihood that LLW stored onsite may not be limited to internal reactor components. For example, refurbishment activities that occur prior to the siting of a State or regional disposal facility could result in the storage of dry active waste or other LLW.

Concern: SWM.018 **Comment:** 017.007 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1, 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

The commercial disposal facility in the State of Washington is usually referred to as the Richland, not Hanford, facility; similarly references to Hanford site in Northwest and Rocky Mountain Compact should be changed to Richland site (see p. 6-5, line 10; p. 6-18, Table 6.8, line 17; p. 6-21, line 38; p. 6-24, line 34).

Concern: SWM.018 **Comment:** 017.008 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

The discussion of VR treatments implies that Table 6.2 depicts volume only after onsite treatment, and does not take into consideration the significant VR that occurs at offsite processing and treatment facilities (see p. 6-5, line 27).

Concern: SWM.018 **Comment:** 017.009 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter suggests that the listing of VR and waste minimization efforts include dewatering and evaporation (see p. 6-9, line 2).

Concern: SWM.018 **Comment:** 017.010 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 1 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

The discussion of VR should note that, although the volume of waste has declined significantly in recent years, the radioactivity of the waste remains unchanged (see p. 6-9 et seq.).

Concern: SWM.018 **Comment:** 017.011 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

The discussion in GEIS Section 6.3.1.2 (p. 6-13) regarding estimates of LLW should also indicate the uncertainty about disposition of nonfuel bearing components.

Concern: SWM.018 **Comment:** 017.012 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter notes that other plants storing LLW onsite include D.C. Cook, Fermi, Big Rock Point, and Palisades. These plants, some of which produce more waste than Vermont Yankee, have stored waste since November 1990 (see p. 6-16, line 21).

Concern: SWM.018 **Comment:** 017.013 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter points out that the infomation given in Table 6.8 (p. 6-18, line 10) in the Midwest Compact row is incorrect. The column "Disposal siting plans" should reflect the revocation of Michigan's membership in the Compact, and the designation of Ohio as the host State. The column "Routine waste issues" should state the following: "The expulsion of Michigan and the designation of a new host State will result in considerable delay in the development of a regional disposal facility."

Concern: SWM.018 **Comment:** 017.014 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter points out that the infomation given in Table 6.8 (p. 6-18) in the Midwest Compact row should reflect the following: the column "Anticipated volume needs" should reflect that about 83 percent of the projected LLW volume is attributable to nuclear plants (approximately 61,000 cf annually). The column "Refurbishment waste issues created by license renewal" should state the following: "Refurbishment wastes will have to be considered in establishing a design capacity for the regional disposal facility." The column "Transportation issues" should state the following: "None noted." (This row may no longer be needed because the sample D.C. Cook plant is no longer in the Midwest Compact.)

Concern: SWM.018 **Comment:** 017.015 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Reference to "Southwestern Compact" should be changed to "Southwest Compact" (see p. 6-18, Table 6.8, line 17; p. 6-26, line 32).

Concern: SWM.018 **Comment:** 017.016 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Footnote "c" of Table 6.8 (p. 6-20, line 8) should be replaced by a reference to this letter (i.e., Comment letter submitted by Midwest Interstate Low-Level Radioactive Waste Commission). (This footnote may no longer be necessary since D.C. Cook is no longer in the Midwest Compact.)

Concern: SWM.018 **Comment:** 017.017 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter suggests that the likelihood of prolonged onsite storage of LLW should be reexamined given more recent delays in scheduled expected operation dates for new disposal sites. While some States and Compacts have made significant progress, others have encountered problems that will result in extended storage unless one or more existing sites remain open after 1992.

Concern: SWM.018 **Comment:** 017.018 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 2 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

With the expulsion of Michigan, the Midwest Compact row of Table 6.9 (p. 6-22) should reflect 8 plants and resultant changes in volumes, and the source reference should be changed. (This row may no longer be necessary because D.C. Cook is no longer in the Midwest Compact.)

Concern: SWM.018 **Comment:** 017.019 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

The rest of the paragraph (on p. 6-22) following "Michigan, the host state . . ." should be deleted because it is inaccurate and outdated.

Concern: SWM.018 **Comment:** 017.020 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

D.C. Cook plant is no longer in the Midwest Compact (p. 6-23, line 6).

Concern: SWM.018 **Comment:** 017.021 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter notes that no Compacts appear to be considering curie limits on LLW facilities (see p. 6-25, line 1).

Concern: SWM.018 **Comment:** 017.022 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter notes that the assumption that all nuclear plants would be decommissioned upon expiration of their operating licenses was made in order to determine the impact of decommissioning wastes on the Midwest Compact's first regional disposal facility. Its purpose is not to establish a "worst case" boundary for planning adequate annual disposal space for routine and refurbishment wastes. In fact, such an assumption would not necessarily lead to a "worst case" boundary because it is unlikely that plants will be immediately dismantled when licenses expire. The Midwest Compact volume projections did take into consideration unusual or infrequent utility events (e.g., some replacement of condenser tubing, feedwater pumps, etc.); however, these events were not assumed to be associated with plant relicensing. (See GEIS p. 6-25, line 19).

Concern: SWM.018 **Comment:** 017.023 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter notes that the comparison of refurbishment waste with current volume allocations is somewhat meaningless because the allocations are only relevant to the current disposal sites. It should be sufficient to simply recognize that, to the extent possible, refurbishment wastes should be considered in planning for new facility capacity (see p. 6-25, line 24).

Concern: SWM.018 **Comment:** 017.024 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter notes that an additional relicensing consideration is the impact of the deferred decommissioning on future disposal facilities. The impact affects subsequent host States and the capacity of their disposal facilities (see p. 6-25, Section 6.3.3.3).

Concern: SWM.018 **Comment:** 017.025 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Commenter points out that, while it may be possible to sign a post-1992 agreement with a State or Compact, it is highly unlikely. The only such agreement between Compacts and the States at this time is a disposal contract between the Rocky Mountain and Northwest Compacts. This contract was made possible only because the Rocky Mountain Compact generates an extremely small amount of waste annually (less than 4,000 ft^3/yr). Otherwise, such agreements are politically volatile regarding the amount and source of LLW that is expected to be disposed. (See GEIS discussion on p. 6-26, line 8.)

Concern: SWM.018 **Comment:** 017.026 **Subtopic:** LLW disposal
Commenter: Larson **Page:** 3 **Org:** Midwest Interstate Low-Level Radioactive Waste Commission

Califomia no longer intends to incorporate a mixed waste unit in its disposal facility (see p. 6-26, line 32).

Docket Number: 018

Concern: AQE.004 **Comment:** 018.001 **Subtopic:** Aquatic issues-Riparian zones
Commenter: Swanson **Page:** 1–2 **Org:** Arizona Department of Environmental Quality

A State agency responded to an NRC request from the public workshop seeking specific inputs on the importance of riparian zones on aquatic ecology, and the impact of nuclear power plant

operations on aquatic insect fauna. The commenter defines a riparian area, identifies five ways in which the riparian zone is important to the ecology of streams and rivers, and identifies five potential impacts on these zones from nuclear power plant operation. Additionally, the commenter addresses the impact of thermal pollution on aquatic insects.

Docket Number: 019

Concern: NONE	**Comment:** 019.001	**Subtopic:** Supportive statement
Commenter: Murphy	**Page:** 2–3	**Org:** Vermont Yankee Nuclear Power Corporation

An electric utility company believes the proposed Part 51 rule is a sound approach to making the license renewal process a reasonable and cost-effective way of extending the useful life of nuclear power plants. He believes the proposed rule will not stifle public participation, but rather will focus the participation into the appropriate areas that are specific to the plant site requesting the license amendment. As for public participation, he stated that any issue can be challenged under the auspices of 10 CFR 2.758 if new information not included in the original analysis of record (i.e., the GEIS) is found, or if unique circumstances exist for the individual plant.

Concern: NONE	**Comment:** 019.002	**Subtopic:** Spent fuel
Commenter: Murphy	**Page:** 2	**Org:** Vermont Yankee Nuclear Power Corporation

On the subject of HLW, an electric utility company believes that the annual generation of spent fuel will remain at the current or a somewhat lower level based on improvements in fuel management. A monitored retrievable storage (MRS) facility is currently planned for 1998 which would act as a holding point for spent fuel until the permanent facility is constructed. In the event the MRS is not ready by 1998, the spent fuel can be safely stored on the plant site.

Concern: NONE	**Comment:** 019.003	**Subtopic:** Supportive statement
Commenter: Murphy	**Page:** 2	**Org:** Vermont Yankee Nuclear Power Corporation

An electric utility company believes that the NRC does not have the responsibility for need determination, but rather this decision will be made by utilities, State public service boards and the Federal Energy Regulatory Commission (FERC). However, he believes that the license renewal process proposed by the NRC will not impact the State's role or diminish in any way the State's regulatory authority.

Docket Number: 021

Concern: NRR.001 **Comment:** 021.001 **Subtopic:** Waste disposal
Commenter: Bruner **Page:** 1 **Org:** Individual

A private citizen believes that our inability to safely dispose of radioactive waste makes nuclear power unacceptable. We should be phasing out nuclear power plants, not relicensing them.

Docket Number: 022

Concern: GIS.016 **Comment:** 022.001 **Subtopic:** Rulemaking & GEIS approach
Commenter: Storey **Page:** 1 **Org:** Individual

A private citizen believes that because of the nuclear power industry's safety record, we need to ensure that necessary safeguards are being met. With generic environmental statements, safety is unnecessarily compromised.

Docket Number: 023

Concern: NEP.005 **Comment:** 023.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Morgan **Page:** 1 **Org:** Individual

A private citizen believes that almost all of the issues involved in license renewal are site-specific and should be addressed with a site-specific EIS covering all health and safety, waste, economic, and alternative energy issues.

Docket Number: 024

Concern: NEP.005 **Comment:** 024.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Cooke **Page:** 1 **Org:** Individual

A private citizen is of the opinion that there should be a separate, site-specific EIS for each plant.

Docket Number: 025

Concern: NRR.001	**Comment:** 025.001	**Subtopic:** Waste disposal
Commenter: Wodtke S.	**Page:** 1–2	**Org:** Individual

A private citizen believes that there is no place to put nuclear waste safely. The Federal government wants to dump the responsibility for dealing with nuclear waste on the States and to take away people's rights to say no to the siting of waste sites. Leave the rights with the people.

Docket Number: 026

Concern: NRR.001	**Comment:** 026.001	**Subtopic:** Waste disposal
Commenter: Wodkte	**Page:** 1	**Org:** Individual

A private citizen believes that we should immediately stop using nuclear power plants because we neither have, nor are close to having a safe and satisfactory method of disposing of radioactive nuclear wastes. This waste, which kills humans, will be radioactive for millions of years. Don't contaminate the environment for future generations.

Concern: NEP.005	**Comment:** 026.002	**Subtopic:** Public participation/site-specific EISs
Commenter: Wodkte	**Page:** 1	**Org:** Individual

A private citizen is of the opinion that if we must have nuclear power plants, then we must have public input before construction and during any license renewal.

Docket Number: 027

Concern: NEP.005	**Comment:** 027.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Kushner	**Page:** 1	**Org:** Action for a Clean Environment

A public interest group believes that generic environmental review means there would be no site-specific studies of most health and safety issues, and any waste, economic, alternative energy, or emergency planning issues.

Concern: GIS.016	**Comment:** 027.002	**Subtopic:** Rulemaking & GEIS approach
Commenter: Kushner	Page: 1	**Org:** Action for a Clean Environment

A public interest group noted that the GEIS does not take into account safety records. For example, the Vogtle plant (in commenter's home State), has one of the worst safety records.

Does the GEIS mean that Vogtle could be examined generically and declared as safe as other nuclear plants?

Concern: NRR.002	**Comment:** 027.003	**Subtopic:** GEIS approach
Commenter: Kushner	**Page:** 1	**Org:** Action for a Clean Environment

A public interest group noted that as power plants age they should be examined more critically, not less.

Docket Number: 028

Concern: NEP.009	**Comment:** 028.001	**Subtopic:** Periodic assessments
Commenter: Medley et al.	**Page:** 1–2	**Org:** Earth Concerns of Oklahoma

A public interest group noted that scientific conclusions are really only statements of probability. The real questions are thus not about conclusions, but about the assumptions. The NRC by trying to increase the number of generic assumptions involved in decision making will logically decrease the stability of the conclusions. The NRC is not dealing with immediately observable events. It wants to gamble on the next 20 years.

Docket Number: 029

Concern: NONE	**Comment:** 029.001	**Subtopic:** None
Commenter: Weaver	**Page:** 1	**Org:** Ohio State Clearinghouse, Office of Budget and Management

State Clearinghouse Coordinator infoms the NRC that the Environmental Review Renewal of Operating License documents have been simultaneously reviewed by interested State agencies, and that comments may be attached.

Docket Number: 030

Concern: NEP.005	**Comment:** 030.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Kiely	**Page:** 1	**Org:** Individual

A public interest group believes that the NRC should prepare a full and separate GEIS before granting a license renewal for a plant. The group is opposed to any attempt by the NRC to simplify the licensing renewal process for nuclear power plants, cutting the public out of the relicensing process by resolving all important environmental issues before any plant applies for relicensing.

Concern: ALT.001 **Comment:** 031.001 **Subtopic:** Categorization of issues
Commenter: Gleason **Page:** 5–12 **Org:** New York State Energy Office

A State agency expressed an opinion that the NRC may not make generic findings on alternatives to nuclear power plant relicensing under NEPA. Many factors contributed to this opinion. NEPA specifically requires a "hard look" at the environmental consequences of the proposed relicensing action. However, the GEIS fails to take a hard look at the real alternatives to license renewal. The commenter further believes that a hard look is not even possible in most instances since the renewal period is beyond current utility planning horizons. The GEIS also fails to provide the necessary balancing analysis between economic and environmental considerations when all alternatives but coal were rejected. The commenter stated that while cost is an appropriate factor to consider in choosing among alternatives, power supply planning involves a constantly evolving examination of forecast demands, available resources, and opportunities to satisfy or reduce demand. A generic approach to the economics of power supply and demand twenty or thirty years hence cannot possibly produce a reliable result and is unduly speculative. The commenter also indicated that the viability and costs of alternative technologies in the year 2020 is even more speculative. The experience in New York is that projections regarding supply and demand are constantly changing, and that a transformation is taking place in the electric generation market that is having an impact on baseload capacity projections. Therefore, the commenter indicated that the NRC cannot now predict that if capacity is needed in the future, that it will be baseload capacity. In conclusion, the commenter referenced specific court rulings as the basis for stating that NEPA can only be satisfied by the preparation of a site-specific EIS for each license renewal application that explores the reasonable alternatives available at the time of the application.

Concern: NGC.004 **Comment:** 031.002 **Subtopic:** State participation
Commenter: Gleason **Page:** 13–14 **Org:** New York State Energy Office

A State agency commented that the need for electric generating capacity is a matter to be decided by the States, and not by the NRC. The Atomic Energy Act of 1954 (AEA), as amended, leaves to State public utility commissions or similar bodies the responsibility for making decisions regarding the need for power. The commenter indicated that the primary concern of the NRC in the licensing context is national security, and public health and safety. Therefore, the commenter indicated that in exercising its authority to renew licenses for nuclear power plants, the NRC must base its decisions on issues of security, and health and safety, and not on considerations of need or economic feasibility which are solely matters of State concern. The commenter stated that if the purpose for considering need for capacity is to satisfy a requirement to consider the alternatives available to reduce or avoid adverse environmental impacts per 10 CFR 51.71(d), then it should not be done generically since there is no basis for the GEIS conclusion that all of the capacity available today is going to be needed in the year 2020.

Concern: NGC.008 **Comment:** 031.003 **Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Gleason **Page:** 14 **Org:** New York State Energy Office

A State agency commented that the GEIS estimate of current nuclear capacity available is flawed in that it includes capacity provided by 118 nuclear power plants. Construction at 4 of those plants has stopped, and at 3 (Shoreham, Rancho Seco, and Yankee Rowe), operations have terminated.

Concern: SWM.016 **Comment:** 031.004 **Subtopic:** Categorization/SWM issues
Commenter: Gleason **Page:** 14–16 **Org:** New York State Energy Office

A State agency commented that the entire radiological waste dilemma is far too dynamic to be dismissed generically at this time. High-level, low-level, and mixed waste assumptions are based on the premise that either facilities for waste disposal will be developed, or that it will be economically and environmentally acceptable to develop the necessary storage capacity onsite at the time of license renewal. However, there is sufficient controversy surrounding the siting of regional compacts and individual State disposal facilities to lead the NRC to assume that some areas will lack the necessary disposal capacity. Even in situations where the siting process is progressing, the outcome of licensing decisions and possible future litigation are unknown. With radioactive waste likely to be a problem at the time of license renewal, the commenter believes that the issue needs to be assessed on an individual plant basis. The costs of the specific method for accommodating waste onsite must be considered in calculating the benefit of relicensing decisions, and these determinations are meaningful only on a plant-specific basis.

Concern: AQE.006 **Comment:** 031.005 **Subtopic:** Aquatic issues-impacts on aquatic systems
Commenter: Gleason **Page:** 16–17 **Org:** New York State Energy Office

A State agency strongly disagreed with the NRC conclusion that aquatic ecology issues are of minor impact and do not require analysis during individual facility relicensing efforts. The commenter indicated that the impacts to aquatic ecology from cooling water withdrawal can be significant, and continue to be a major concern in New York. Biological monitoring has consistently demonstrated that impacts imposed on an aquatic ecosystem in producing electricity are directly related to the volume of water used. The commenter believes that aquatic ecology impacts, such as entrainment and impingement of fish and shellfish, must be reviewed site specifically during relicensing as Category 3.

Concern: NEP.007 **Comment:** 031.006 **Subtopic:** Cumulative impacts
Commenter: Gleason **Page:** 18 **Org:** New York State Energy Office

A State agency commented that the GEIS failed to address the potential cumulative impacts of Category 1 issues. At a particular facility, any one of the 80 Category 1 issues may be minor, but when viewed cumulatively and/or in combination with other Category 2 or 3 issues, significant

impacts may be occurring. The commenter believes that this underscores the need for site-specific reviews of aquatic ecology issues.

Concern: AQE.001	**Comment:** 031.007	**Subtopic:** Aquatic ecology-refurbishment/Categorization of issues
Commenter: Gleason	**Page:** 18–19	**Org:** New York State Energy Office

A State agency stated that the NRC has failed to consider the long-term aquatic impacts from continued plant operation. The commenter believes that since any adverse aquatic impacts would continue for an additional 20 years, relicensed plants should have their intake and discharge structures reviewed as if they were a new facility. The best available technology (BAT) to mitigate impacts, that is economically achievable, may well be different given this additional 20 years of plant operation. Improved technologies include cogeneration to reduce waste heat, fish conserving intake screens, fish return systems, and closed cycle cooling systems. The commenter believes that site-specific evaluations should be made for each plant where aquatic impacts are of concern, making it a Category 2 issue.

Concern: NEP.005	**Comment:** 031.008	**Subtopic:** Public participation/site-specific EISs
Commenter: Gleason	**Page:** 19	**Org:** New York State Energy Office

A State agency is concerned that the proposed rulemaking seeks to require NRC staff to prepare an Environmental Assessment (EA) for every license renewal application instead of an EIS. There is concern that with an EA, public review and input in many cases will be precluded. The commenter recommends that if an EIS is not to be produced in every case, provisions should be made in the EA to invite public review and comment.

Concern: SWQ.002	**Comment:** 031.009	**Subtopic:** Water use-refurbishment
Commenter: Gleason	**Page:** 19–20	**Org:** New York State Energy Office

A State agency indicated that the NRC may have overlooked its legal obligation and the obligations of its nuclear power licensees to comply with Section 401 of the Clean Water Act (CWA). The commenter believes that the NRC cannot issue a license renewal until a facility has complied with Section 401, and the issue should be addressed in the GEIS.

Docket Number: 032

Concern: LIR.001	**Comment:** 032.001	**Subtopic:** Refurbishment schedule
Commenter: Parker	**Page:** A1.1-3	**Org:** Northern States Power

An electric utility company argued that the NRC's conservative, upper-bound analysis (as used in the analysis of radiation dose impacts, selection of case study plants for socioeconomic impacts, evaluation of the effects of cooling tower operation, etc.) goes beyond NEPA's requirements in

42 U.S.C. Sec. 4321–4370. NEPA requires that Federal agencies prepare a detailed statement that discloses the environmental and other impacts of a proposed action. NEPA mandates that the NRC take a "hard look" at the effects on the environment of the proposed action, but does not require that an environmental impact assessment (EIA) evaluate "worst-case" scenarios.

Concern: LIR.001 **Comment:** 032.002 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.3-4 **Org:** Northern States Power

An electric utility company pointed out that neither the NRC's nor the CEQ's regulations implementing NEPA require the use of conservatively bounded analysis. The CEQ regulations require agencies to include sufficient detail in an EIS so a decision maker can make an informed decision. The NRC regulations do not impose additional requirements that justify more conservative analysis.

Concern: LIR.001 **Comment:** 032.003 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.4-5 **Org:** Northern States Power

An electric utility company pointed out that the NRC's approach does not follow established NEPA case law. Under the law, when the NRC lacks plant-specific information, it may choose a sample of plants that represent average values for each impact and make conclusions on that basis. While the NRC has used this averaging approach, it has, in several cases, employed upper-bound, conservative analysis in the GEIS (e.g., refurbishment activities that would be required at a majority of plants). The implementing regulations and NEPA case law suggest a more sensible and efficient approach.

Concern: LIR.001 **Comment:** 032.004 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.5-7 **Org:** Northern States Power

An electric utility company noted that the NRC is authorized to use generic rulemaking to determine that some specific risks need not be assessed on a plant-specific basis. However, in making such generic determinations, nothing in the regulations and case law require an agency to use upper-bound estimates in the impact analysis. Commenter references the case of *Baltimore Gas & Electric v. Natural Resources Defense Council*, whereby the court ruled that the NRC is not required to exceed the standards to win approval of its EIS.

Concern: LIR.001 **Comment:** 032.005 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.7-8 **Org:** Northern States Power

An electric utility company pointed out that NEPA's disclosure requirements do not dictate the form or methodology of an agency's environmental statements. It cited the case of *Vermont Yankee v. Natural Resources Defense Council* where the Supreme Court held that the identification of generic safety concerns used by the Licensing Board did not require elucidation to satisfy NEPA.

Concern: LIR.001 **Comment:** 032.006 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.8-9 **Org:** Northern States Power

In support of its contention that the NRC's GEIS approach should have used reasonable, "average" estimates instead of upper-bound estimates, an electric utility company argued that the NRC has extensive representative information and plant operating histories that would make it possible to reliably predict which scenarios would likely occur and the extent of the environmental impact of each scenario.

Concern: LIR.001 **Comment:** 032.007 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.9 **Org:** Northern States Power

In support of its contention that the NRC's GEIS approach should have used reasonable, "average" estimates instead of upper-bound estimates, an electric utility company argued that as long as the NRC complies with the provisions of the Administrative Procedure Act and its statutory duties, the courts may not require the NRC to adopt additional procedural requirements.

Concern: LIR.001 **Comment:** 032.008 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.9-10 **Org:** Northern States Power

An electric utility company said that the NRC's adoption of extreme rather than average values makes it focus on unlikely and unrepresentative possible impacts, which are not applicable to most plants and which are not likely to occur. It cites the GEIS analysis of the impacts of cooling tower on surface water use, where detailed information on the Limerick and Palo Verde plants was presented because they offer a worst-case analysis of water use conflicts. The NRC focuses on these unique situations in spite of its conclusion that existing State or Federal water use permits are adequate to deal with the issue.

Concern: LIR.001 **Comment:** 032.009 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.10-11 **Org:** Northern States Power

In arguing against the use of worst-case scenarios, an electric utility company cited the fact that CEQ has withdrawn such requirements and this withdrawal was upheld by the Supreme Court. Moreover, the NRC did not adopt this requirement into its NEPA-implementing regulations.

Concern: LIR.001 **Comment:** 032.010 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.11-12 **Org:** Northern States Power

An electric utility company pointed out that the "CEQ regulations now provide that agencies must disclose the fact of incomplete or unavailable information, acquire the information if possible, and evaluate reasonably foreseeable significant adverse impacts . . . ."

Concern: LIR.001 **Comment:** 032.011 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.13 **Org:** Northern States Power

In arguing against the use of worst-case scenarios, an electric utility company pointed out that case law makes it clear that "agencies should be guided by a rule of reason in performing all aspects of the EIS analysis." Thus, they need not discuss in detail those events with very small probabilities of occurrence.

Concern: LIR.001 **Comment:** 032.012 **Subtopic:** Refurbishment schedule
Commenter: Parker **Page:** A1.13-14 **Org:** Northern States Power

An electric utility company further emphasizes that the NRC has acted conservatively and nothing in the statute, regulations, and case law require the extreme conservatism taken by the NRC in reevaluating environmental impacts for license renewal and in selecting the worst-case scenarios for the details in the EIS. [Related to comments 032.001–032.011.]

Concern: GIS.012 **Comment:** 032.013 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A2.1 **Org:** Northern States Power

An electric utility company questioned the requirement in proposed Section 51.53(c)(3)(ii)(J), which would require the license applicant to demonstrate that "the replacement of equivalent generating capacity by a coal-fired plant has no demonstrated cost advantage over the individual nuclear power plant license renewal." It believes that such a requirement would force the applicant to perform an economic analysis of an alternative to license renewal. It argued that a coal-fired plant is not environmentally preferable to a nuclear plant, and therefore, an economic analysis would contradict Federal case law in *Sierra Club v. Morton.*

Concern: GIS.012 **Comment:** 032.014 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A2.2 **Org:** Northern States Power

An electric utility company argued that an economic consideration is not required by NEPA.

Concern: GIS.012 **Comment:** 032.015 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A2.3 **Org:** Northern States Power

In arguing against an economic analysis of alternatives, an electric utility company pointed out that the "NRC's adjudicatory decisions make clear that NEPA is concerned with environmental alternatives, not economic alternatives."

Concern: GIS.012 **Comment:** 032.016 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A2.3–4 **Org:** Northern States Power

In arguing against an economic analysis of alternatives, an electric utility company concluded that the proposed rule requiring an economic analysis to demonstrate the economic benefits of operating a nuclear plant "directly contradicts existing NRC and Federal case law." It asks the NRC to reconsider this proposed requirement.

Concern: GIS.008 **Comment:** 032.017 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.1 **Org:** Northern States Power

Re. FR 47031, Table B-1: Change CWA 316(b) determination . . . to CWA 316(a) determination is required for heat shock.

Concern: REG.002 **Comment:** 032.018 **Subtopic:** DG-4002-Editorial comments
Commenter: Parker **Page:** A3.1 **Org:** Northern States Power

Re. DG-4002, page 16: Sentence states that if both 316(a) and 316(b) documents are available, item C may be omitted. This does not agree with NUREG-1429 which eliminates the information required by items B, C, and D if 316(a) and 316(b) are available. Change the sentence to read: "If the required documents are available, items B, C, and D may be omitted."

Concern: REG.002 **Comment:** 032.019 **Subtopic:** DG-4002-Editorial comments
Commenter: Parker **Page:** A3.1 **Org:** Northern States Power

Re. DG-4002, page 27: The requirements of the draft Regulatory Guide DG-4002 and the Standard Review Plan NUREG-1429, do not match. If items A and B of DG-4002 are met, only item C is omitted. NUREG-1429 omits items C through G. Also, DG-4002 contains item H, which is not in NUREG-1429.

Concern: REG.006 **Comment:** 032.019a **Subtopic:** NUREG-1429
Commenter: Parker **Page:** A3.1 **Org:** Northern States Power

Re. page C-21: See inconsistencies pointed out in Comment 032.019.

Concern: REG.006 **Comment:** 032.020 **Subtopic:** NUREG-1429
Commenter: Parker **Page:** A3.1 **Org:** Northern States Power

Re. page C-45: DG-4002 (p. 30) requires under item I that the magnitude of potential impact on health from shock-hazard be discussed if item A is not met. NUREG-1429 has no such discussion.

Concern: DEC.003 **Comment:** 032.021 **Subtopic:** Radiation dose
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page 7-7, sec. 7.2.3 of GEIS: The decommissioning work completed on the Pathfinder plant could be discussed in this section. It will continue to have a byproduct license.

Concern: GIS.008 **Comment:** 032.022 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page 7-8, Table 7-1, line 16: The Pathfinder is located in Sioux Falls, South Dakota.

Concern: GIS.008 **Comment:** 032.023 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-41, line 2: The Monticello plant is located 35 miles from Minneapolis.

Concern: GIS.008 **Comment:** 032.024 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-41, line 26: The amount of land Northern States Power owns at Monticello site is 2,150 acres, not 1,325 acres.

Concern: GIS.008 **Comment:** 032.025 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-42, lines 29 and 40: The 1990 census information is available and should be used to show populations. The 1990 population within a 50-mile radius of Monticello is 2,240,000.

Concern: GIS.008 **Comment:** 032.026 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-41, line 33: Change "Nearby Features" to read "The business district of Monticello is about 2 miles SE."

Concern: GIS.008 **Comment:** 032.027 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-52, line 30: Minneapolis 1990 census found it to have a population of 368,380.

Concern: GIS.008 **Comment:** 032.028 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-52, line 33: Land use within 5 miles of the Prairie Island Plant would be better described as dairy farming and agricultural. Change "vegetable canning" to "agricultural."

Concern: GIS.008 **Comment:** 032.029 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.2 **Org:** Northern States Power

Re. page A-52, line 34: Change "Nearby Features" to read "The business district of the town of Red Wing is about 6 miles SE."

Concern: GIS.008 **Comment:** 032.030 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-15, line 5: The net MWe for the Monticello plant is 536 MWe not 525 MWe.

Concern: GIS.008 **Comment:** 032.031 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-15, line 9: It has been estimated that the amount of replacement power required above the 6 weeks needed for refueling will be less than 2,000 hours for Monticello, not 14,200 hours.

Concern: GIS.008 **Comment:** 032.032 **Subtopic:** Corrections
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-15, line 6: Refurbishment cost given for Monticello is 4 times larger than found in recent calculations. Reevaluate the use of the Monticello cost data from the Sandia National Laboratories report, SAND88-7095, *Cost Savings from Extended Life Nuclear Plants.*

Concern: GIS.012 **Comment:** 032.033 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-22, line 19: Clarify if the value of $20/kW(e) is acceptable for use in calculating the operation cost maximum using the equation on page H-29. If not, what is the number based on?

Concern: GIS.012 **Comment:** 032.034 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-28, lines 9 and 11: A description of what goes into the operation and maintenance (O&M) costs should be included so that it is standardized for users of this table. FERC Form 1 information may be a good source.

Concern: GIS.012 **Comment:** 032.035 **Subtopic:** Cost-benefit analysis
Commenter: Parker **Page:** A3.3 **Org:** Northern States Power

Re. page H-29, line 14: A detailed description of the derivation of this equation should be given to increase the understanding of the factors that are included when this equation is used.

Docket Number: 033

Concern: NRR.002 **Comment:** 033.001 **Subtopic:** GEIS approach
Commenter: Meyer **Page:** 1 **Org:** Sierra Club

A public interest group commented that no reactor should be allowed to run beyond its normal license period without full and open public hearings. The NRC's plan to characterize issues as generic is unacceptable to the organization.

Docket Number: 034

Concern: NRR.002 **Comment:** 034.001 **Subtopic:** GEIS approach
Commenter: Keppel **Page:** 1 **Org:** Individual

A private citizen is opposed to the proposed GEIS rulemaking. He believes that nuclear power plants are high-risk systems that demand careful consideration, ample time for review of problems, and opportunity for public comment.

Docket Number: 035

Concern: NONE **Comment:** 035.001 **Subtopic:** Supportive statement
Commenter: Domsife **Page:** 1 **Org:** Pennsylvania Department of Environmental Resources

A State agency concurs with the NRC's conclusion that the GEIS is an appropriate way to address the environmental impacts of extended plant operations.

Concern: NONE
Commenter: Domsife
Comment: 035.002
Page: 1
Subtopic: Supportive statement
Org: Pennsylvania Department of Environmental Resources

A State agency encourages the NRC to continue its current research on nuclear plant aging, which would play an important role in decisions about plant shutdown or continued operation.

Concern: LIR.005
Commenter: Domsife
Comment: 035.003
Page: 2
Subtopic: Refurbishment activities
Org: Pennsylvania Department of Environmental Resources

A State agency interprets the discussion on pages 2-26 through 2-27 of the GEIS (Section 2.4) as indication that an NRC review of the licensee's assessment is not mandated. It believes an NRC review of the licensee's evaluation and assessment is necessary to ensure that the assessment is comprehensive. This review should be completed before the licensee initiates the process of integrating inspection, surveillance, testing, and maintenance (ISTM) program into existing plant activities.

Concern: NONE
Commenter: Domsife
Comment: 035.004
Page: 3
Subtopic: Supportive statement
Org: Pennsylvania Department of Environmental Resources

A State agency finds the approach to develop established effective programs for structures, systems, and components (SSCs) to be "well conceived and comprehensive."

Concern: LIR.006
Commenter: Domsife
Comment: 035.005
Page: 3
Subtopic: Refurbishment activities
Org: Pennsylvania Department of Environmental Resources

Re. Table 2.5: A State agency noted that the current proposed change to 10 CFR Part 50 will require all licensees to examine 100 percent of all beltline reactor vessel welds per the American Society of Mechanical Engineers (ASME) Code 1989. The table indicates "only a portion of the beltline welds" will be inspected.

Concern: LIR.007
Commenter: Domsife
Comment: 035.006
Page: 3–4
Subtopic: Analysis-approach, assumptions, and data
Org: Pennsylvania Department of Environmental Resources

Re. Table 2.7: Labor hours, additional onsite personnel, and occupational exposure are substantially low. Commenter provides data from Three Mile Island (TMI) to substantiate this claim.

Concern: POA.013 **Comment:** 035.007 **Subtopic:** Plant aging
Commenter: Domsife **Page:** 5 **Org:** Pennsylvania Department of Environmental Resources

Re. Section 5.3 (Accidents): While the ISTM guidelines are well-founded, they are also generic. The development of the ISTM program should be plant-specific. Provisions should be made for NRC staff to validate that SSCs have overcome age-related degradation, prior to entering the license renewal phase and during the renewed term.

Concern: POA.014 **Comment:** 035.008 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Domsife **Page:** 5–6 **Org:** Pennsylvania Department of Environmental Resources

A reevaluation of the OFF-SITE Risk should be made with the extended fuel cycle source term and updated demographic variables. Some plants are considering 2-yr fuel cycles and by the time the license is renewed, a significant number of plants would be on extended fuel cycle.

Concern: POA.015 **Comment:** 035.009 **Subtopic:** Generic safety issues
Commenter: Domsife **Page:** 6 **Org:** Pennsylvania Department of Environmental Resources

Residual plant life is a major factor in making a significant determination for unresolved generic safety issues (GSIs). Such determination and the resulting plant modifications may have to be reviewed in view of the 20 years of incremental plant life due to license renewal.

Concern: POA.011 **Comment:** 035.010 **Subtopic:** SAMDAs
Commenter: Domsife **Page:** 7 **Org:** Pennsylvania Department of Environmental Resources

The apparent conclusion drawn from the SAMDA assessments at Comanche Peak and Limerick that SAMDAs at older plants may not contribute to risk reduction seems rather premature. There are ongoing failures and situations at the plants that could directly affect safety systems.

Concern: SWM.023 **Comment:** 035.011 **Subtopic:** LLW disposal-volume
Commenter: Domsife **Page:** 7–8 **Org:** Pennsylvania Department of Environmental Resources

The GEIS assumes that all activities listed in Table 2.6 will occur during the last 10 years, at a given plant. It is important to note that many plants have included or will include these activities during their original operating license term, and prior to the 10-yr refurbishment period. Therefore, it is expected that the actual volume of LLW generated as a result of refurbishment/ replacement activities will be considerably lower than the projected volume reported in Section 6.3.1.2 of the GEIS.

Concern: SWM.024 **Comment:** 035.012 **Subtopic:** LLW disposal-volume
Commenter: Domsife **Page:** 8 **Org:** Pennsylvania Department of Environmental Resources

The values given for the average incremental increase in LLW generation during the 10-yr renewal refurbishment activities for boiling water reactors (BWRs) (3200 ft^3) and pressurized water reactors (PWRs) (7970 ft^3) are incorrect. These numbers should be revised as follows:

Average incremental increase for BWRs = (8600 ft^3 x 4)+ 23450 ft^3)/10 = 5794 ft^3/yr
Average incremental increase for PWRs = (9500 ft^3 x 4)+ 70200 ft^3)/10 = 10820 ft^3/yr

Table 6.5 should also be modified to include the projected activity (Ci) and waste class (A, B, or C) for the listed refurbishment/life extension activities.

Concern: SWM.025 **Comment:** 035.013 **Subtopic:** LLW disposal
Commenter: Domsife **Page:** 9 **Org:** Pennsylvania Department of Environmental Resources

The average quantities of greater than Class C (GTCC) wastes listed in Table 6.6 seems too low for BWRs and too high for PWRs. A DOE report (DOE/LLW-114, 8/91) estimates the GTCC generation rates in the form of cartridge filters to be 3.5 ft^3 to 6.5 ft^3 per plant per fuel cycle for BWRs and 2.4 ft^3 to 3.5 ft^3 for PWRs. These numbers translate to 2,520 to 4,680 ft^3 for BWRs and 3,511 to 5,121 ft^3 for PWRs for 40 years of plant operation. The estimated volume of decontamination resin GTCC (not listed for BWRs in Table 6.6) is 100 ft^3/BWR or 1,900 ft^3 for all BWRs and 150 ft^3/PWR or 7,650 ft^3 for all PWRs through shutdown. Some PWRs will probably require replacement or removal of various components as indicated in Table 2.6. This will probably result in more than 11 ft^3 during the refurbishment period.

Concern: SWM.025 **Comment:** 035.014 **Subtopic:** LLW disposal
Commenter: Domsife **Page:** 9 **Org:** Pennsylvania Department of Environmental Resources

Table 6.9 has 8 plants for the Appalachian Compact instead of the actual 11 operating plants.

Concern: SWM.025 **Comment:** 035.015 **Subtopic:** LLW disposal
Commenter: Domsife **Page:** 10 **Org:** Pennsylvania Department of Environmental Resources

The numbers reported for annual LLW shipments in Sections 2.2.4.4 and 6.6.1.1 are not consistent. It is also not clear whether the reported numbers include shipments made to the processors or only those shipped directly to the burial sites.

Concern: SWM.046 **Comment:** 035.016 **Subtopic:** Transportation
Commenter: Domsife **Page:** 10–11 **Org:** Pennsylvania Department of Environmental Resources

Re. Section 6: The transportation accident risk analysis in NUREG-0170, Revision 1, is very conservative. The package release models are somewhat unrealistic. Better models with more realistic assumptions should be used in order to avoid any unwarranted concern over increased projected total accident risks. The NRC's proposed changes to the radioactive waste transportation regulations, if approved, will provide additional protection against workers and the public during both normal and accident transportation conditions.

Concern: DEC.007 **Comment:** 035.017 **Subtopic:** Waste management
Commenter: Domsife **Page:** 11 **Org:** Pennsylvania Department of Environmental Resources

A State agency asked what would be the recommended disposal procedures for reactors, steam generators, pressurizers, pressure vessels, and other large units. It is of the opinion that the technology used to decommission nuclear plants would improve between now and the actual date of dismantlement. This technology may, in turn, decrease volumes of LLW and alter current decommissioning procedures.

Docket Number: 036

Concern: NRR.006 **Comment:** 036.001 **Subtopic:** Alternatives to license renewal
Commenter: Powitz **Page:** 1 **Org:** Individual

A private citizen is opposed to the proposed GEIS rulemaking. The commenter believes that nuclear power is a public hazard and is environmentally unsound, and that alternative energy production methods should be emphasized and implemented instead.

Docket Number: 037

Concern: NRR.002 **Comment:** 037.001 **Subtopic:** GEIS approach
Commenter: Winnell **Page:** 1 **Org:** Individual

A private citizen is opposed to the proposed GEIS rulemaking. He believes that there must be greater citizen participation in the licensing of nuclear power plants, and in the storage and transportation of radioactive waste.

Concern: NONE
Commenter: McLean
Comment: 038.001
Page: 1
Subtopic: Supportive statement
Org: Maryland Department of Natural Resources

A State agency endorses and encourages the use of a generic environmental rulemaking. It believes the proposed Part 51 rule is consistent with other generic NRC rulemakings which have proven effective in reducing costs to the Federal government, the taxpayer, and the electricity consumer with no apparent compromise in environmental quality.

Concern: AQE.007
Commenter: McLean
Comment: 038.002
Page: 2
Subtopic: Contaminants in sediments or biota
Org: Maryland Department of Natural Resources

A State agency supports the Category 1 or 2 assignments for radiological issues; however it contests Category 1 assignments for certain nonradiological environmental impacts related to cooling water use. (See comment 038.009.)

Concern: NEP.002
Commenter: McLean
Comment: 038.003
Page: 2
Subtopic: Regulatory responsibility
Org: Maryland Department of Natural Resources

A State agency is concerned that while it is correct to recognize that certain environmental issues which are covered by Federal agencies other than the NRC, or by State and local governments are addressable outside the NRC regulatory envelope, the license renewal process must assure compliance with all environmental regulations irrespective of categorical assignments and regulatory authority.

Concern: AQE.017
Commenter: McLean
Comment: 038.004
Page: A-1
Subtopic: Water treatment
Org: Maryland Department of Natural Resources

A State agency is concerned with the GEIS conclusion that facilities with approved 316(a) demonstrations and 316(b) reports do not have to address aquatic impacts, with the exception of threatened and endangered species. It pointed out that over half of the 74 nuclear facilities listed in Table 2.1 were constructed before 1980 and hence their 316(a) and 316(b) documents are out of date. Since impact assessment methodologies have improved substantially since that time period, and many impacts considered adequate at that time may be considered inadequate today, the agency questioned how the NRC was going to ensure that balanced, indigenous populations will be protected and that existing plant technology is minimizing impacts.

Concern: NEP.007 **Comment:** 038.005 **Subtopic:** Cumulative impacts
Commenter: McLean **Page:** A-1 **Org:** Maryland Department of Natural Resources

A State agency pointed out that the GEIS does not include a cumulative assessment of the affects of nuclear power plant operation. It believes that the license renewal process is an appropriate forum to address direct and indirect impacts on the environment resulting from over 30 years of operation, as well as future operations. It suggests that a license renewal applicant be required to provide an evaluation of cumulative impacts in the supporting environmental report.

Concern: AQE.007 **Comment:** 038.006 **Subtopic:** Contaminants in sediments or biota
Commenter: McLean **Page:** A-1 **Org:** Maryland Department of Natural Resources

A State agency believes that the discharge of heavy metals by existing nuclear power plants with once-through systems should be recategorized as Category 2. Discharges from copper-nickel condenser tubes may have long-term effects that will not be addressed through a Category 1 assignment. It believes a Category 2 classification is more appropriate requiring any facility with copper-nickel condenser tubes to quantify metal loading increments and assess the long-term effects.

Concern: AQE.017 **Comment:** 038.007 **Subtopic:** Water treatment
Commenter: McLean **Page:** A-2 **Org:** Maryland Department of Natural Resources

A State agency would like confirmation that the GEIS conclusion that those facilities without 316(b) evaluations must evaluate the impacts of entrainment and impingement on fish and shellfish in their license renewal application also applies to those facilities in which BAT determinations have not been addressed. It pointed out that the lack of a 316(b) evaluation and formal BAT determination most frequently occurs when a facility meets thermal regulations and hence does not have to apply for alternate effluent limitations or produce a 316(a) Demonstration. The burden of proof under 316(b) lies with the regulator and unless the State regulations independently require a BAT determination, then the permittee is under no obligation to conduct a 316(b) evaluation.

Concern: AQE.017 **Comment:** 038.008 **Subtopic:** Water treatment
Commenter: McLean **Page:** A-2 **Org:** Maryland Department of Natural Resources

A State agency pointed out that 2 nuclear power plants, Arkansas Nuclear One and McGuire, appear not to have BAT determinations (Volume 2, Appendix F of NUREG-1437). It would like to know if these facilities are classified as having "unresolved" 316(b) issues and therefore are assigned a Category 2 impact and if not, how is the GEIS treating these facilities.

Concern: SWQ.001 **Comment:** 038.009 **Subtopic:** Water use-refurbishment
Commenter: McLean **Page:** A-2 **Org:** Maryland Department of Natural Resources

A State agency believes that the GEIS relies too heavily on the National Pollutant Discharge Elimination System (NPDES) permit renewal process to account for impacts discussed in Sections 4.2.3.1.9–4.2.3.1.11 of NUREG-1437. It pointed out that with respect to the NPDES permit process, the level of communication between EPA and delegated States varies and in at least one region, a tendency exists for delegated States to reissue permits with insufficient review. The State agency questioned how the NRC was going to ensure that potential aquatic impacts from all nuclear plants will be assessed and dealt with properly given that there is evidence that the process the NRC is relying on is inconsistent or substandard.

Concern: NONE **Comment:** 038.010 **Subtopic:** Supportive statement
Commenter: McLean **Page:** A-3 **Org:** Maryland Department of Natural Resources

A State agency agrees with the anticipated regulatory changes in GEIS Section 3.8.1.1. It believes that an annual limit of 2 rem/year is realistically achievable even at the present time.

Concern: HHI.043 **Comment:** 038.011 **Subtopic:** Radiation exposure-public/worker
Commenter: McLean **Page:** A-3 **Org:** Maryland Department of Natural Resources

A State agency pointed out that the identification and monitoring of all significant pathways, as referenced in Section 3.8.1.2, should be done to ensure that the effluent information used in the calculation of offsite doses is as current and as accurate as possible. It cited that when plants are designed there are specific effluent pathways that are identified based on plant design and intended operation. Plant modifications or refurbishment may alter the configuration of existing effluent pathways, eliminate some pathways or create new ones.

Concern: HHI.049 **Comment:** 038.012 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean **Page:** A-4 **Org:** Maryland Department of Natural Resources

A State agency agrees with the GEIS conclusion in Section 3.8.1.4 that refurbishment activities will not significantly affect the total dose to the general public, however, it should be noted that during the refurbishment year, the total volume and activity of solid waste will be significantly greater than for a normal operating year.

Concern: SWM.001	**Comment:** 038.013	**Subtopic:** LLW storage/disposal
Commenter: McLean	**Page:** A-4	**Org:** Maryland Department of Natural Resources

A State agency believes that the GEIS conclusion in Section 3.8.1.6 is limited in relation to the existence of onsite storage facilities. Refurbishment of a light water reactor (LWR) may require construction of temporary onsite waste storage facilities or large component demolition and decontamination may require specialized facilities equipped with systems similar to storage facilities. These potential eventualities need to be addressed.

Concern: HHI.044	**Comment:** 038.014	**Subtopic:** Occupational exposure
Commenter: McLean	**Page:** A-4	**Org:** Maryland Department of Natural Resources

A State agency agrees with the GEIS conclusions in Section 3.8.2.2, however it pointed out that the occupational exposure may vary even more greatly for refurbishment activities than has been observed for major reactor overhauls to date. Additionally, these exposures are dependent on reactor type.

Concern: NONE	**Comment:** 038.015	**Subtopic:** Supportive statement
Commenter: McLean	**Page:** A-5	**Org:** Maryland Department of Natural Resources

A State agency pointed out that the GEIS assumptions in Section 3.8.2.3 are arbitrary and represent only one of many possible refurbishment scenarios. However, it believes that the analysis is sound and agrees that limiting individual doses within the range of 1 to 2 rem per year ensures that the total health risk to a work force is not significantly different from the cancer risk to an unexposed work force.

Concern: HHI.049	**Comment:** 038.016	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean	**Page:** A-5	**Org:** Maryland Department of Natural Resources

A State agency noted that in GEIS Section 4.6.1, the text should reference that the main cause of reduced effluents has been improved fuel integrity and better operation of existing radioactive-waste systems. Early BWRs had defective fuel that was replaced in most cases prior to 1980. Additionally, installation of improved gaseous treatment equipment as a result of 10 CFR 50 Appendix I, also significantly reduced both gaseous and liquid releases.

Concern: HHI.045 **Comment:** 038.017 **Subtopic:** Public exposure
Commenter: McLean **Page:** A-5 and 6 **Org:** Maryland Department of Natural Resources

A State agency pointed out that an equation is improperly referenced on page 4-73 line 27 of the GEIS. The following change is suggested.

Change From: $(1-e^{-t})$ To: $(1-e^{-\lambda t})$

Additionally, it pointed out that the statement that tritium represents the greatest dose contributor from liquid effluents is not correct in all cases for marine or estuarine LWR sites or for BWRs. Quantities of tritium produced in a PWR exceeds comparable sized BWR production by an order of magnitude. Where liquid waste is discharged into potable water supplies, tritium may contribute the greatest amount of whole body dose. However, where plant discharges are in nondrinking or irrigation waters, radionuclides of cobalt, manganese, or silver are the principal dose contributors, and the pathway for these contaminants is via ingestion of seafood. Further, the agency pointed out that site-specific data should be used to accurately quantify these impacts, and it also highlighted some site-specific variances.

Concern: HHI.046 **Comment:** 038.018 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean **Page:** A-6 **Org:** Maryland Department of Natural Resources

A State agency believes that the bioaccumulation factors need to be adjusted for actual site conditions in the evaluation of impacts prior to and after refurbishment. It emphasized that the use of field-derived site-specific data is the only way to accurately quantify radionuclide uptake and estimate associated environmental impacts. Additionally, the bioaccumulation factors reflect a database generated in the late 1960s and 1970s.

Concern: HHI.047 **Comment:** 038.019 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean **Page:** A-6 and 7 **Org:** Maryland Department of Natural Resources

A State agency pointed out that the GEIS analysis in Section 4.6.1.2 is not completely accurate for all plant designs. Most BWRs do not have completely shielded secondary systems and therefore, contribute some measurable dose to a site boundary that may be less than 800 meters away. In addition, the use of hydrogen injection to reduce the effect of intergranular stress corrosion cracking has caused substantial increases in dose rates at the contact point with steam containing components and at many locations onsite. In such cases, substantial additional concrete shielding may be needed to ensure that actual site boundary doses remain small fractions of background radiation.

Concern: HHI.013	**Comment:** 038.020	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean	**Page:** A-7	**Org:** Maryland Department of Natural Resources

A State agency suggested that the GEIS emphasize that doses reported in the referenced documents (Section 4.6.2) are all based on measured releases and offsite dose modeling consistent with the model described in Regulatory Guide 1.109. Additionally, it is not possible to accurately detect incremental offsite doses on the order of 1 to 3 mrem per year with actual offsite dose measurement, and these small incremental changes can only be estimated by calculations based on releases measured at their source.

Concern: TEL.016	**Comment:** 038.021	**Subtopic:** Onsite land use
Commenter: McLean	**Page:** A-7	**Org:** Maryland Department of Natural Resources

A State agency noted that although the land use assumption for calculating the overall impact of a generic 1,000 MW(e) LWR may accurately represent an "average" reactor, there is great variability among the individual sites as to the amount and quality of the land, i.e., Arizona will have more utility-owned land available than New York. This variability does not get captured in the "average" land use determination.

Concern: TEL.016	**Comment:** 038.022	**Subtopic:** Onsite land use
Commenter: McLean	**Page:** A-7	**Org:** Maryland Department of Natural Resources

A State agency suggested that the document should note that "permanent" land commitment may require substantial financial resources and may generate enormous volumes of very slightly contaminated soil and other materials should a power plant be decontaminated and restored to near its original condition to be made available for nonindustrial use. This may affect the economics of site restoration and future reuse of the site.

Concern: SWQ.014	**Comment:** 038.023	**Subtopic:** Water use
Commenter: McLean	**Page:** A-8	**Org:** Maryland Department of Natural Resources

A State agency pointed out that the water use estimates for a plant using once-through cooling appear lower than expected based on today's technology.

Concern: HHI.014 **Comment:** 038.024 **Subtopic:** Public exposure
Commenter: McLean **Page:** A-8 **Org:** Maryland Department of Natural Resources

A State agency pointed out that in interpreting the risk estimates, it is important to remember that collective doses, which result from the exposure of very large groups of people to extremely small individual doses, permit calculation of numerical health risk estimates that are purely theoretical. Current epidemiological methods are not adequate to isolate and quantify health effects associated with an increase in annual dose of only a few percent; therefore, it seems unlikely new evidence will ever exist to demonstrate adverse health effects resulting from environmental doses associated with LWRs. (NUREG-1437, Vol. I, Section 4.8.5.)

Concern: GRW.008 **Comment:** 038.025 **Subtopic:** Radioactive effluents
Commenter: McLean **Page:** A-8 **Org:** Maryland Department of Natural Resources

A State agency cited that the GEIS does not address the possibility of leaching of radioactive material stored underground into potentially potable water supplies (NUREG-1437, Vol. I, Section 4.8.6). Since many radionuclides have half-lives well in excess of the minimum container integrity of 300 years and since NUREG-1437 addresses potential environmental effects as much as 1,000 years into the future, groundwater contamination potential should be discussed.

Concern: SWM.009 **Comment:** 038.026 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-8 **Org:** Maryland Department of Natural Resources

A State agency is concerned about the GEIS conclusion that HLWs are to be buried at a Federal repository, and that no release to the environment is associated with such disposal. It pointed out that it is difficult to predict what effects HLW storage and disposal will have 1,000 years from now when no Federal repository for this waste currently exists. (NUREG-1437, Vol. I, p. 4.8.6).

Concern: HHI.039 **Comment:** 038.027 **Subtopic:** Occupational exposure
Commenter: McLean **Page:** A-9 **Org:** Maryland Department of Natural Resources

A State agency believes that the estimate for annual occupational dose attributable to all phases of the uranium fuel cycle is too low. Additionally, it is inconsistent with information provided in Table 3.12 (NUREG-1437, Vol. I, 4.8.7).

Concern: POA.024 **Comment:** 038.028 **Subtopic:** Severe accidents
Commenter: McLean **Page:** A-9 **Org:** Maryland Department of Natural Resources

A State agency implied that the industry's IPE, mandated by NRC Generic Letter 88-20, should be used for postulating the general characteristic of accidents (NUREG-1437, Vol I, 5.2.1). It believes the IPE provides greater details regarding the margin of safety in terms of probabilistic assessment.

Concern: POA.025 **Comment:** 038.029 **Subtopic:** Fission products
Commenter: McLean **Page:** A-9 **Org:** Maryland Department of Natural Resources

A State agency pointed out that some of the gaseous fission products, namely xenon and krypton, are located in the fuel matrix and in the region between the fuel pellet and the cladding inner wall, known as the gap region. The agency pointed out that in some accident events it is possible to rupture the cladding, thereby releasing the noble gases in the gap, while the fuel matrix has not been significantly challenged.

Concern: POA.026 **Comment:** 038.030 **Subtopic:** Editorial
Commenter: McLean **Page:** A-9 **Org:** Maryland Department of Natural Resources

A State agency pointed out that page 5-3 line 1 should be changed to read, "The reactor containment structure and containment support systems are designed to minimize the possibility of this type of release."

Concern: POA.025 **Comment:** 038.031 **Subtopic:** Fission products
Commenter: McLean **Page:** A-9 **Org:** Maryland Department of Natural Resources

A State agency pointed out that the effectiveness of fission product removal mechanisms, including settling, plate-out, and scrubbing, are accident and sequence specific. Additionally, they can be reversed in certain accident sequences and thus, may delay the release of fission products but do not prevent it. This should be noted on page 5-3 lines 11–20.

Concern: POA.025 **Comment:** 038.032 **Subtopic:** Fission products
Commenter: McLean **Page:** A-10 **Org:** Maryland Department of Natural Resources

A State agency pointed out that radioactive decay is an important consideration in accident analysis primarily from the perspective of heat removal. It should be noted that it is only applicable to those fission products with a half-life shorter than one or two days. (see p. 5-3, lines 32–36).

Concern: POA.027	**Comment:** 038.033	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: McLean	**Page:** A-10	**Org:** Maryland Department of Natural Resources

A State agency disagrees with the GEIS conclusion that significant environmental impacts caused by accidents at LWR plants are not at all likely to occur over time periods of a few decades (p. 5-7, lines 8–12). The agency pointed out that the timeframe may actually be longer or shorter than stated and therefore, has little meaning and should be removed. It suggests that the authors consider making the point with respect to IPE results of the estimated core damage frequency per plant.

Concern: POA.026	**Comment:** 038.034	**Subtopic:** Editorial
Commenter: McLean	**Page:** A-10	**Org:** Maryland Department of Natural Resources

A State agency disagrees with the GEIS use of "passive" and "leaktight" in relation to containment structures. It would like the word "passive" to be removed from page 5-9, lines 15–18 because, although the next generation of reactors attempt to incorporate a passive design, the current LWR containments do not employ these techniques. In relation to "leaktight", the agency stated that containments leak and that each plant has certain limitations on leakage which are considered acceptable over a 24-hour period.

Concern: NONE	**Comment:** 038.035	**Subtopic:** Supportive statement
Commenter: McLean	**Page:** A-10	**Org:** Maryland Department of Natural Resources

A State agency agrees with the GEIS statements on page 5-9, lines 29–34. The post-TMI revisions of the emergency operating procedures provide solid guidance to the operator during accident conditions.

Concern: POA.028	**Comment:** 038.036	**Subtopic:** Severe accidents
Commenter: McLean	**Page:** A-11	**Org:** Maryland Department of Natural Resources

Regarding GEIS Section 5.3.5.2, page 5-95, a State agency noted that uncertainty in radionuclide source terms is large and should not be influenced by changes in the plant environment. Additionally, it suggested that more recent, state-of-the-art analytical techniques (e.g., NUREG-1150) be used for perfoming the analysis instead of 10+-year-old technology.

Concern: POA.026	**Comment:** 038.037	**Subtopic:** Editorial
Commenter: McLean	**Page:** A-11	**Org:** Maryland Department of Natural Resources

Regarding GEIS Table 5.35, page 5-109, a State agency pointed out that the footnote marker "a" in the Table should be moved from "3a" to "3c". It noted that hard pipe venting for Mark I handles decay and not anticipated transmit without scram power.

Concern: NONE	**Comment:** 038.038	**Subtopic:** Editorial
Commenter: McLean	**Page:** A-11	**Org:** Maryland Department of Natural Resources

A State agency pointed out that on GEIS page 5-111, line 37, "hat" should be changed to "that."

Concern: SWM.031	**Comment:** 038.039	**Subtopic:** LLW storage/disposal
Commenter: McLean	**Page:** A-12	**Org:** Maryland Department of Natural Resources

A State agency pointed out that the LLW disposal summary on GEIS page 6-41, lines 3–5, should include a statement that would require the plant to submit a plan for extended, indefinite, onsite LLW storage.

Concern: SWM.044	**Comment:** 038.040	**Subtopic:** LLW storage
Commenter: McLean	**Page:** A-12	**Org:** Maryland Department of Natural Resources

A State agency believes that GEIS Section 6.3.3.3, page 6-25, provides a good explanation of storage plan criteria. It pointed out that the final conclusion also needs to include this explanation because as it stands the conclusion is too general.

Concern: SWM.045	**Comment:** 038.041	**Subtopic:** Spent fuel
Commenter: McLean	**Page:** A-12 and 13	**Org:** Maryland Department of Natural Resources

A State agency believes that the discussions in GEIS Sections 6.5.1 and 6.5.2, page 6-34, are too weak. It believes that DOE reports should be used to estimate the amount of spent fuel for independent spent-fuel storage installations (ISFSIs) or MRS facilities. An estimate of onsite storage could, thus, then be made based on appropriate assumptions relating to the existence and timing of a MRS facility and a repository. It implied that this should be done on a per plant basis.

Concern: SWM.011 **Comment:** 038.042 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-13 **Org:** Maryland Department of Natural Resources

A State agency pointed out with regard to GEIS page 6-29, line 4, that spent fuel pool expansion typically is not an option; furthermore, it has not been done in the U.S. Most plants determine the most economical method. Usually expansion is done through reracking of existing pools to maximum density, followed by ISFSI construction using dry [cask] storage techniques.

Concern: SWM.011 **Comment:** 038.043 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-13 **Org:** Maryland Department of Natural Resources

A State agency believes that the list of 9 plants losing full core discharge capacity on GEIS page 6-29, lines 5–10, is incomplete. It believes the list should include the plants depicted in the following table that are contracting for, constructing, or operating ISFSIs

Plants with Existing or Planned ISFSI

Plant	Date	Plant	Date
Surry 1 & 2	1990	Main Yankee	1995
Oconee 1, 2 & 3	1990	Arkansas Nuclear One	1996
Palisades	1992	Oyster Creek	1996
Calvert Cliffs 1 & 2	1994	Fitzpatrick	1996
Prairie Island 1 & 2	1994		

Concern: SWM.011 **Comment:** 038.044 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-13 **Org:** Maryland Department of Natural Resources

A State agency disagrees with the GEIS conclusion on page 6-34, in paragraph 3, that an ISFSI uses little land area. The storage pad dimensions are not the major contributor to land use in an ISFSI; rather, it is that an ISFSI requires a substantially large enclosed area in order to meet the occupational dose limitations of 10 CFR 20.105.

Concern: SWM.011 **Comment:** 038.045 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-14 **Org:** Maryland Department of Natural Resources

A State agency noted with regard to GEIS page 6-34, paragraph 5, that the typical approach of most utilities is to defer taking action to increase their spent fuel capacity for as long as possible, to rerack their spent fuel until the in-pool capacity is near depletion, and then to contract for an

ISFSI. Furthermore, it pointed out that no ISFSI plans for license extension exist today.

Concern: SWM.022 **Comment:** 038.046 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-14 **Org:** Maryland Department of Natural Resources

A State agency pointed out a mathematical error on page 6-35, lines 14, 15, and 18 of the GEIS: 52,000 MTHM should be changed to 42,000 MTHM.

Concern: SWM.011 **Comment:** 038.047 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-14 **Org:** Maryland Department of Natural Resources

A State agency suggested that the statement on page 6-36, paragraph 3, in the GEIS that "worker and population exposures are minimal" should be clarified by citing rules governing the public and worker radiation exposures in 10 CFR 72.104 and 10 CFR 20.105. Additionally, the statement that ISFSIs use only a small fraction of available land is subjective and does not add to the discussion.

Concern: SWM.011 **Comment:** 038.048 **Subtopic:** Spent fuel
Commenter: McLean **Page:** A-14 **Org:** Maryland Department of Natural Resources

Although the conclusions on page 6-36 of the GEIS appear sound, a State agency argued that they could be more firmly substantiated. The requirements for controls on the environmental impact of spent fuel storage are not likely to change due to extended operation.

Concern: DEC.012 **Comment:** 038.049 **Subtopic:** Radiation dose
Commenter: McLean **Page:** A-14 and 15 **Org:** Maryland Department of Natural Resources

A State agency believes that the GEIS assumption on beta emitters on page 7-16, line 10, is incorrect. The document states that ". . . it contributes nothing . . . . to the worker." The agency believes that beta emitters could contribute a significant dose if inhaled or ingested. Additionally, 10 CFR Part 20 reduced the eye dose limit to 50 percent due to beta radiation.

Concern: SWM.002 **Comment:** 038.050 **Subtopic:** LLW storage
Commenter: McLean **Page:** A-15 **Org:** Maryland Department of Natural Resources

Regarding page 9-4, paragraph 1 of the GEIS, a State agency is concerned that existing LLW storage facilities may not have the capacity to accept additional LLW generated by license renewal extension, particularly in places where the State is not part of a LLW Compact.

Docket Number: 039

Concern: NONE **Comment:** 039.001 **Subtopic:** References Docket 63
Commenter: Harwood **Page:** 1 **Org:** Duke Power Company

An electric utility company supports the NUMARC comments on the proposed rulemaking and the GEIS. It especially supports the following key points: 1) the generic approach is appropriate and supportable, 2) it is appropriate to allow the NRC discretion about whether to prepare an EIS, and 3) the GEIS review should be accorded finality.

Docket Number: 040

Concern: NEP.005 **Comment:** 040.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Barocsi **Page:** 1 **Org:** Individual

A private citizen argues that a generic approach to the EIA is unacceptable and that the relicensing process should require a comprehensive EIS on a site-specific basis.

Docket Number: 041

Concern: GIS.009 **Comment:** 041.001 **Subtopic:** Nuclear power plants covered by GEIS
Commenter: Sorensen **Page:** 1 **Org:** Washington Public Power Supply System

An electric utility company believes that the proposed rule and the GEIS should be revised to include Washington Nuclear Plants Units 1 and 2. The revision should clearly state that the proposed rule and GEIS apply to "power reactors currently licensed to operate and plants that have been issued and currently hold construction permits, have undertaken substantial construction, and have not been terminated."

Docket Number: 042

Concern: NEP.005 **Comment:** 042.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Ware **Page:** 1 **Org:** Individual

A private citizen is opposed to the NRC's simplification of the license renewal process by resolving important environmental issues before the application for renewal is submitted. He argues that the NRC be required to prepare a full EIS.

Concern: HHI.018 **Comment:** 043.001 **Subtopic:** Public exposure
Commenter: Schroeder **Page:** 1 **Org:** Florida Coalition for Safe Energy

A public interest group argues that the license renewal evaluation process should include a study of the health effects on the public residing near a nuclear power plant.

Concern: AQE.006 **Comment:** 043.002 **Subtopic:** Aquatic issues-impacts on aquatic systems
Commenter: Schroeder **Page:** 1 **Org:** Florida Coalition for Safe Energy

A public interest group argues that the license renewal evaluation process should include a study of the effects on marine life of cooling water ejected from nuclear power plants.

Concern: SWM.001 **Comment:** 043.003 **Subtopic:** LLW storage/disposal
Commenter: Schroeder **Page:** 1 **Org:** Florida Coalition for Safe Energy

A public interest group argues that a key issue is the adequacy of the means for temporary radioactive waste storage.

Concern: SWM.047 **Comment:** 043.004 **Subtopic:** Transportation
Commenter: Schroeder **Page:** 1 **Org:** Florida Coalition for Safe Energy

A public interest group argues that another key issue is the safety of the transportation routes for radioactive waste.

Concern: POA.009 **Comment:** 043.005 **Subtopic:** Categorization of issues
Commenter: Schroeder **Page:** 1 **Org:** Florida Coalition for Safe Energy

A public interest group argues that shifts in population density and in fixed geographic factors that have occurred since the original license was issued could affect the adequacy of current evacuation capabilities.

Concern: NEP.010 **Comment:** 043.006 **Subtopic:** Analysis of alternatives
Commenter: Schroeder **Page:** 1-2 **Org:** Florida Coalition for Safe Energy

A public interest group argues that a cost-effectiveness study should be required before a license renewal application is submitted.

Docket Number: 044

Concern: HHI.016 **Comment:** 044.001 **Subtopic:** Safety standards
Commenter: Saltzman **Page:** 1 **Org:** Individual

A private citizen argues that Federal standards for radiation and safety are less strict than those of the States and that the States standards should prevail.

Concern: NEP.005 **Comment:** 044.002 **Subtopic:** Public participation/site-specific EISs
Commenter: Saltzman **Page:** 1 **Org:** Individual

A private citizen argues that the proposed rule should recognize the site-specific nature of the issues.

Docket Number: 045

Concern: NEP.005 **Comment:** 045.001 **Subtopic:** Public participation/site-specific EISs
Commenter: S. Plotkin **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 046

Concern: NEP.005 **Comment:** 046.001 **Subtopic:** Public participation/site-specific EISs
Commenter: M. Plotkin **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 047

Concern: NEP.005	**Comment:** 047.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Fuller	**Page:** 1	**Org:** Individual

A private citizen opposes the use of generic environmental statements and urges the NRC to prepare complete environmental statements for each license renewal application.

Docket Number: 048

Concern: NEP.005	**Comment:** 048.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Anderson	**Page:** 1	**Org:** Individual

A private citizen objects to the categorization of most issues as generic with respect to environmental impact. He particularly objects to 1) the classification of "Health and Safety" and "Waste" issues as generic; and 2) the presumption that nuclear plant license renewals are preferable to and competitive with altemative technologies.

Docket Number: 049

Concern: NEP.005	**Comment:** 049.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Elder	**Page:** 1	**Org:** Concemed Citizens for SNEC Safety

A public interest group objects to the assumption in the proposed rule that locality-specific problems can be dealt with at the national level. It urges the NRC to scrap the proposed rule and perform a site-specific environmental review for each license renewal application.

Docket Number: 050

Concern: NEP.005	**Comment:** 050.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Hirt	**Page:**	**Org:** Toledo Coalition for Safe Energy

A public interest group opposes the proposed Part 51 rule and believes that the NRC should have to prepare a full EIS before granting a renewal for each plant.

Docket Number: 051

Concern: NEP.005	**Comment:** 051.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Kasower	**Page:**	**Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal. With the proposed Part 51 rulemaking, she believes citizens will no longer be able to participate in the license renewal process, stating "let the public be informed and continue to voice their concerns." She also implied that the EA is the State's responsibility and that the NRC should allow States to set stricter standards than the NRC's proposed Part 51 rule.

Docket Number: 052

Concern: NEP.005	**Comment:** 052.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Raskin	**Page:** 1	**Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal. With the proposed Part 51 rulemaking, she believes citizens will no longer be able to participate in the license renewal process, stating "let the public be informed and continue to voice their concerns." She also implied that the EA is the State's responsibility and that the NRC should allow States to set stricter standards than the NRC's proposed Part 51 rule.

Docket Number: 053

Concern: NEP.005	**Comment:** 053.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Victor	**Page:** 1	**Org:** Concerned Citizens of Litchfield and Dutchess Counties

A public interest group opposes the proposed Part 51 rule, requesting that all license renewal issues be open for specific consideration and that each facility complete an EIS. The group is specifically concerned with the generation of nuclear waste and the escalating problems relative to the disposition of this waste. It believes a more cautious approach to license renewal should be used.

Docket Number: 054

Concern: NRR.002 **Comment:** 054.001 **Subtopic:** GEIS approach
Commenter: Kvalseth **Page:** vi **Org:** Minnesota Department of Public Service

State agencies (the Minnesota Department of Public Service, Health, Natural Resources, and Public Safety; the Minnesota Environmental Quality Board; and the Minnesota Pollution Control Agency) objected to the proposed rule and GEIS, and asked that the proposed rule be withdrawn. It cited the following reasons: (1) the NRC has attempted to appropriate the States' regulatory authority over the nonsafety aspects of nuclear power generation in violation of AEA and case law; and (2) the NRC did not comply with NEPA. Moreover, it stated that "the proposed rule obstructs public participation and conceals environmental impact concerns that should go before the NRC during site-specific relicensing consideration." (See Comments 054.002, 054.003, and 054.009 for details.)

Concern: NGC.004 **Comment:** 054.002 **Subtopic:** State participation
Commenter: Kvalseth **Page:** vi–vii **Org:** Minnesota Department of Public Service

State agencies stated that the proposed rule preempts State authority relevant to nuclear plant relicensing. Pursuant to the AEA and relevant case law, the States retain the authority to regulate electric utilities with regard to questions of need, reliability, cost, and other related concerns. The NRC failed to adopt the view of commenters to a proposed 1990 rulemaking, who stated that the NRC should defer to the States' need determinations. Although the NRC has indicated that its proposed rule (10 CFR Part 51) is not intended to alter the States' rights, it has neither withdrawn the proposed rule nor amended it accordingly.

Concern: NEP.005 **Comment:** 054.003 **Subtopic:** Public participation/site-specific EISs
Commenter: Kvalseth **Page:** vii **Org:** Minnesota Department of Public Service

State agencies believe that the proposed rule fails to comply with NEPA because public involvement is obstructed on most of the issues identified in the GEIS. The CEQ regulations implementing NEPA require that an EIS assess the impact of proposed actions, rather than justify decisions already made.

Concern: NONE **Comment:** 054.004 **Subtopic:** Public participation/site specific EISs
Commenter: Kvalseth **Page:** vii **Org:** Minnesota Department of Public Service

Incorporated in Comment 054.003.

Concern: NEP.007 **Comment:** 054.005 **Subtopic:** Cumulative impacts
Commenter: Kvalseth **Page:** vii **Org:** Minnesota Department of Public Service

State agencies noted that the use of the GEIS fails to properly tier documents. By excluding most environmental issues, the proposed rule also fails to consider the cumulative or interactive effects of the issues at the local level.

Concern: NEP.006 **Comment:** 054.006 **Subtopic:** Periodic assessments
Commenter: Kvalseth **Page:** vii–viii **Org:** Minnesota Department of Public Service

State agencies stated that the proposed rule ignores NEPA's mandate to consider significant new information because there is no provision to permit examination of significant new information for any issue determined to be acceptable in the GEIS and there is no periodic agency review of the underlying GEIS or for the introduction of new information during the NRC consideration of a specific license renewal application.

Concern: ALT.033 **Comment:** 054.007 **Subtopic:** Analysis of alternatives
Commenter: Kvalseth **Page:** viii **Org:** Minnesota Department of Public Service

State agencies stated that the proposed rule prevents the consideration of DSM, conservation, and renewables during plant-specific relicensing. The NRC ignores rapidly changing technologies and costs of non-nuclear and non-fossil fueled power generation alternatives. Moreover, the NRC examines only large-scale and centralized power station applications.

Concern: NEP.012 **Comment:** 054.008 **Subtopic:** Regulatory responsibility
Commenter: Kvalseth **Page:** viii **Org:** Minnesota Department of Public Service

State agencies said that the proposed rule and GEIS violate NEPA because (1) other environmental review requirements by State or local governments are not identified; and (2) conflicts between the proposed action and the objectives of Federal, regional, State, local, or tribal governments are not considered.

Concern: NEP.005 **Comment:** 054.009a **Subtopic:** Public participation/site-specific EISs
Commenter: Kvalseth **Page:** ix **Org:** Minnesota Department of Public Service

State agencies believe that the proposed rule should be withdrawn or modified to specifically require the NRC to produce a draft EA or supplemental EIS (SEIS) for individual plant relicensing applications and to require notice for public comment. Preparation of a final EA or SEIS without public notice for comment is unacceptable.

Concern: NEP.006 **Comment:** 054.009b **Subtopic:** Periodic assessments
Commenter: Kvalseth **Page:** ix **Org:** Minnesota Department of Public Service

State agencies believe that the proposed rule should be withdrawn or modified to schedule an NRC review of the GEIS's adequacy every 5 years at a minimum.

Concern: NGC.004 **Comment:** 054.010 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 4–8 **Org:** Minnesota Department of Public Service

In support of their contention that the proposed rule preempts the States' determination of need, State agencies presented court cases that upheld States rights, pursuant to the AEA, ". . . the States exercise their traditional authority over the need for additional generating capacity, ..." In making a determination about need for generating capacity, the NRC did not concern itself about whether specific utilities complied with the Public Utilities Regulatory Policy Act, and State and local conservation efforts. Since the NRC agrees that it does not have the authority to preempt a State's right to determine need, the following provision could be placed in proposed Section 51.53(c) as a new provision "(5)" or as part of "(4):"

> "The supplemental report must contain the State's decision on the need for that applicant's nuclear power generation. Where the State has found no need for continuing power generation by the applicant plant, the findings documented in Table B-1 of Appendix B of Subpart A of this part no longer demonstrate that renewal of the applicant's operating license will have accrued benefits that outweigh the economic, environmental and social cost of license renewal."

In addition, the NRC should state that no preemption is intended, and the following statement could be added to amend 10 CFR 51.1, or inserted in the introductory material to Appendix B to Subpart A after the second sentence and immediately preceding the sentence that begins, "Table B-1. . . :"

> "These regulations do not preempt a State's right and responsibility to determine need for continued nuclear power generation based on non-safety considerations including its own State and local environmental reviews."

Concern: NEP.001 **Comment:** 054.011 **Subtopic:** Purpose or use of GEIS
Commenter: Kvalseth **Page:** 8–10 **Org:** Minnesota Department of Public Service

State agencies presented additional arguments for why they believe that the proposed rule violates NEPA. First, the purpose of the NEPA process is to place environmental issues before decision makers to be considered when taking action, not to resolve issues. Second, the proposed rule violates 40 CFR 1502.2(g) by using the GEIS to justify the NRC's decision to relicense plants, thus, obstructing use of an EIS to assess the environmental impact of the NRC's decision to relicense a specific plant.

Concern: NEP.001 **Comment:** 054.012 **Subtopic:** Purpose or use of GEIS
Commenter: Kvalseth **Page:** 9–10 **Org:** Minnesota Department of Public Service

Incorporated in Comment 054.011.

Concern: NEP.005 **Comment:** 054.013 **Subtopic:** Public participation/site-specific EISs
Commenter: Kvalseth **Page:** 10–12 **Org:** Minnesota Department of Public Service

State agencies contend that the procedure adopted in the proposed rule precludes public participation and violates the requirements of 40 CFR 1506.6(a) and 1506.6(b). By having a rule that precludes consideration of 102 out of 104 environmental issues in an individual license renewal application, the NRC already violates the policy of encouraging public involvement. The NRC further negates public involvement by amending its own environmental regulations so that it only needs to prepare an EA, which does not require public comment.

Concern: NEP.012 **Comment:** 054.014 **Subtopic:** Regulatory responsibility
Commenter: Kvalseth **Page:** 13 **Org:** Minnesota Department of Public Service

State agencies stated that the site-specific relicensing environmental review described in the proposed rule does not consider 40 CFR 1501.7, which requires agencies to "indicate any public EA and other EISs which are being or will be prepared that are related to but are not part of the scope of the impact statement under consideration." Only when a nuclear plant actually applies for license renewal will a State consider the preparation of an EIS. The proposed rule does not have a provision for considering a State EIS.

Concern: NEP.012 **Comment:** 054.015 **Subtopic:** Regulatory responsibility
Commenter: Kvalseth **Page:** 13–14 **Org:** Minnesota Department of Public Service

State agencies contend that the proposed rule does not comply with NEPA because it prevents cooperation with State and local agencies who have their own environmental protection acts. The CEQ regulations in 40 CFR 1501.7(6), 40 CFR 1506.2(b), and 1506.2(c) call for such joint cooperation activities. The bifurcated method of analysis adopted by the NRC makes it impossible for the NRC to comply with these requirements. Provision must be made for consideration of State and other environmental review during a plant-specific license renewal review process.

Concern: NEP.012 **Comment:** 054.016 **Subtopic:** Regulatory responsibility
Commenter: Kvalseth **Page:** 14–15 **Org:** Minnesota Department of Public Service

State agencies pointed out that 40 CFR 1502.16(c) requires that the EIS discuss "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans. . . ." The proposed rule does not discuss such possible conflicts. For example, under the

proposed rule, no discussion occurs or can occur regarding possible conflicts between the Indian plans for an MRS and Prairie Island relicensing (in Minnesota).

Concern: NEP.001 **Comment:** 054.017 **Subtopic:** Purpose or use of GEIS
Commenter: Kvalseth **Page:** 15–19 **Org:** Minnesota Department of Public Service

State agencies contend that the proposed rule fails to tier documents in a manner required by NEPA. Under the definition of tiering (in 40 CFR 1508.28), the GEIS would cover the broader program or policy of relicensing, while the proposed 10 CFR Part 51 with its provision for an environmental review followed by the preparation of either an EA or SEIS would constitute the site-specific statement. The NRC's preparation of the GEIS appears to follow the NEPA mandate to integrate environmental concerns "into the fabric of agency planning." At the site-specific level, the NRC's tiering of the GEIS to a site-specific EA or EIS evades that mandate, which also applies to the NRC's relicensing of specific nuclear plants. The proposed rule eliminates all discussion of Category 1 issues and Category 2 issues for those plants that fall within the bounds. Tiering requires at least a summary of the issues discussed in the broader statement and incorporation by reference of the relevant discussions. The NRC cannot use the GEIS in the same way as the case of *Baltimore Gas v. Natural Resources Defense Council*, which was upheld by the Supreme Court. Unlike that situation, the GEIS for 10 CFR Part 51 does not deal with a single aspect of licensing that does not affect plant-specific environments. The generic determinations made involve 100 environmental issues, not a single issue, and they affect specific plants.

Concern: NEP.006 **Comment:** 054.018 **Subtopic:** Periodic assessments
Commenter: Kvalseth **Page:** 19–23 **Org:** Minnesota Department of Public Service

State agencies contend that the proposed rule obstructs the NEPA mandate to consider significant new information. They believe that the CEQ definition of significance requires, at the least, the preparation of a SEIS. Significant new information, similar to the severe accident issue, may arise in the future. Consideration of that information must be mandatory in the proposed rule. The agencies also cite new information on HLW and LLW management that may become available before relicensing occurs. They recommend insertion of the following provision:

> "When significant new circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts exists at the time of license renewal, the applicant must address it in the applicant's environmental review and the NRC must address it in an SEIS."

This provision should follow Section 51.53(c)(3)(i) by ending (i) with "supplemental report except," then adding this provision as subheading (A).

The following underlined phrase should also be added to the last sentence under Appendix B to Subpart A: "The commission will review periodically the material in this appendix and update it every 5 years and more often if necessary."

Concern: ALT.001 **Comment:** 054.019 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 23–26 **Org:** Minnesota Department of Public Service

State agencies pointed out that the proposed rule prevents appropriate consideration of alternatives and prevents the consideration of cost-benefit analysis of alternatives that the rule purports to provide. Categorizing alternatives as Category 1 excludes discussion of alternatives during a plant-specific license renewal process. Alternative energy resources and conservation present "unresolved conflicts." NEPA Section 102(2)(E) mandates consideration of more ecologically sound alternatives during site-specific relicensing even if no impact statement is required otherwise. By classifying alternatives as Category 1, the NRC has prejudiced the selection of alternatives before the time of making a final decision on the renewal of an individual plant's license.

Concern: ALT.001 **Comment:** 054.020 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 26–28 **Org:** Minnesota Department of Public Service

State agencies contend that the proposed rule obstructs the NRC's cost-benefit analysis of alternatives and prevents consideration of alternatives other than coal-fired plants. The proposed rule intends to require plants applying for license renewal to first meet the economic threshold requirement by showing that nuclear power production is at least as economical as coal-fired plants. However, the way the proposed rule is written, an applicant would not get to the question of economic threshold because, under 10 CFR 51.53(c)(3), the environmental report required of applicants is not supposed to address Category 1 issues. Since alternatives are designated as Category 1, the applicant would not have to address the threshold issue of the cost of replacing nuclear power generation. Also, nowhere in the proposed rule will an applicant address the issue of comparing nuclear power to alternatives other than coal-fired plants. If the NRC seriously believes that an economic threshold analysis must first be passed when considering alternatives, it must at least classify alternatives as Category 2 issues, then include a bounding condition relating to the economic threshold.

Concern: NGC.011 **Comment:** 054.020a **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth **Page:** 28 **Org:** Minnesota Department of Public Service

State agencies contend that the State of Minnesota has taken the position that a social cost approach must be taken to decide on the basis of cost whether nuclear power generation is needed. This approach includes both the internal and external costs of a project. For example, the cost to society of bearing the risk of nuclear power is an external cost that the State of Minnesota believes is appropriate to apply when comparing alternatives to nuclear power generation. Therefore, consideration of alternatives when determining need falls within State jurisdiction.

Concern: NEP.007 **Comment:** 054.021 **Subtopic:** Cumulative impacts
Commenter: Kvalseth **Page:** 29 **Org:** Minnesota Department of Public Service

State agencies contend that no consideration is given to the cumulative or interactive effects of each impact issue. Therefore, the generic conclusion in the GEIS whereby 98 percent of the NEPA issues are identified as acceptable for all plants, is "totally flawed and must be rejected."

Concern: NEP.007 **Comment:** 054.022 **Subtopic:** Cumulative impacts
Commenter: Kvalseth **Page:** 29 **Org:** Minnesota Department of Public Service

State agencies pointed out that changes in the findings for several issues, taken cumulatively, could cause the total environmental impact of the license renewal of a specific plant to be unacceptable. The GEIS and proposed rule make no provision for such an eventuality.

Concern: NGC.004 **Comment:** 054.023 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 30 **Org:** Minnesota Department of Public Service

State agencies pointed out that in the GEIS, page 8-14, line 23 to page 8-15, line 28, the NRC neglects recent technological, economic, and regulatory changes taking place in the industry. Any one of these factors could affect a utility's perceived need for power in the coming years.

Concern: NGC.004 **Comment:** 054.024 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 30–31 **Org:** Minnesota Department of Public Service

State agencies commented that the NRC's analysis is not sufficiently definitive to remain unchallenged for 40 years. Historically, unanticipated changes in generation technology, transmission technology or access, etc., can change the actual need for a utility's capacity and power from that expected earlier. Further, they believe that changes to the analysis cannot sufficiently reduce uncertainty to allow it to remain the basis of relicensing decisions made decades from now.

Concern: NGC.004 **Comment:** 054.025 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 31 **Org:** Minnesota Department of Public Service

State agencies term as "faulty" the NRC's conclusion that the issues on need for generating capacity, direct economic benefits of generating capacity, and direct economic benefit of electric energy are Category 1. These issues must be defined as Category 3 to require nuclear plants to provide the NRC with relevant infomation on need that would be necessary to consider the environmental impacts of relicensing individual plants.

Concern: NGC.004 **Comment:** 054.026 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 33 **Org:** Minnesota Department of Public Service

Given the industry's history of changed expectations for the need for individual plants coincident with major changes in technology, the Minnesota State agencies find it unrealistic for the NRC to ignore the possibility that an individual plant may not require relicensing to meet its owner's need during the next 40 years.

Concern: NGC.004 **Comment:** 054.027 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 33–36 **Org:** Minnesota Department of Public Service

State agencies contend that the NRC has failed to adequately incorporate into its analysis the recognition of widespread consensus that there are significant, and growing opportunities to reduce projected electric demand through improved end use efficiency. The effects of many technological changes will not be fully anticipated far in advance; they can vary significantly among utilities, depending on their customer mix and location.

Concern: NGC.004 **Comment:** 054.028 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 36–37 **Org:** Minnesota Department of Public Service

State agencies believe that the electric industry is poised for regulatory change judging from the goals of the National Energy Strategy where the goal is to promote diversity of electric technology. This would lead to substantial changes in Federal and State regulations to promote competition. Hence, the assumption of stable electric prices may not hold true in the future. Thus, the NRC must define related issues as Category 3, subject to review at the time of individual plant relicensing.

Concern: NGC.004 **Comment:** 054.029 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 37–38 **Org:** Minnesota Department of Public Service

State agencies asked the NRC to clarify its definition of "need" for capacity. The GEIS fails to define who's need for capacity would be considered in an individual filing for relicensing of a nuclear plant. Decisions by future competitors of the nuclear plant owner may displace the need for the plant's capacity, or portions of it.

Concern: NGC.004 **Comment:** 054.030 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 38 **Org:** Minnesota Department of Public Service

Many of the variables used in the NRC's analysis of need are so volatile as to render any forecast in which they are used subject to revision within a few years. Since all issues of need are affected, they must be defined as Category 3 and considered at the time of individual plant relicensing.

Concern: ALT.015 **Comment:** 054.031 **Subtopic:** Demand forecast
Commenter: Kvalseth **Page:** 38 **Org:** Minnesota Department of Public Service

The NRC inappropriately extrapolates short-term projections decades beyond the original author's intent and does so without explanation or justification (see p. 8-4 for demand; p. 8-6 for DSM programs; p. 8-8 for conservation).

Concern: ALT.016 **Comment:** 054.032 **Subtopic:** Demand side management
Commenter: Kvalseth **Page:** 39–40 **Org:** Minnesota Department of Public Service

The NRC's expected 3.8 percent DSM potential for 2010 is so conservative as to suggest a "rosy scenario" comparison for license renewal. The NRC's "high" conservation scenario of 5.4 percent savings by the year 2000 and 8.4 percent in the year 2010 reinforces this perception. The NRC appears to have neglected other aspects of the Oak Ridge National Laboratory (ORNL) report referenced in the GEIS that contradict the GEIS's low levels of expected DSM. A recent estimate by Minnesota agencies of DSM potential for a major Minnesota electric utility was for 9.2 percent annual energy savings from the base forecast by year 2010. Thus, the NRC has failed to demonstrate the basis for its DSM estimate.

Concern: ALT.016 **Comment:** 054.033 **Subtopic:** Demand side management
Commenter: Kvalseth **Page:** 40 **Org:** Minnesota Department of Public Service

Section 8.4 of the GEIS ignores the trend change from demand side technologies. It also ignores possible sudden losses of major industrial load due to an industry's decision to leave, close down, or generate part or all of its own load.

Concern: NGC.004 **Comment:** 054.034 **Subtopic:** State participation
Commenter: Kvalseth **Page:** 41 **Org:** Minnesota Department of Public Service

The values used in the models referenced in the GEIS are subject to uncertainties (see GEIS pp. 8-4 to 8-6 and Appendix H). Although the NRC briefly discusses these factors, it does not explain why such factors should not be revisited when considering individual license renewal applications. Unless the NRC can demonstrate confident forecasting of such variables decades in advance, or demonstrate that economic factors are not significant in determining capacity need or alternatives, affected issues must be defined as Category 3.

Concern: NGC.008 **Comment:** 054.035 **Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Kvalseth **Page:** 41–42 **Org:** Minnesota Department of Public Service

The NRC's recognition that capacity utilization factors vary considerably by type of generating capacity, over time, and by region in itself should lead to designating the affected issues as Category 3 instead of Category 1 or 2. Experience in Minnesota indicates that capacity factor utilization can be a critical factor in determining generation supply mix for a utility. If the NRC

persists in defining affected issues as Category 1 or 2, it must demonstrate that its analysis results are insensitive to large variations in capacity utilization and that these results can be validated.

Concern: ALT.018 **Comment:** 054.036 **Subtopic:** Coal impacts
Commenter: Kvalseth **Page:** 42 **Org:** Minnesota Department of Public Service

Determination of the need for relicensed nuclear power generation depends, in part, on what other generating capacity is available. The GEIS presents retirement schedules for power plants, but these schedules are not explained. The NRC appears to assume that coal plants smaller than 300 MW will not be refurbishment candidates. It is not clear whether the NRC considered plant life extensions with new boiler technologies and/or different fuels. Plant retirements will also depend on future fuel costs, waste disposal costs, emission control costs, etc.

Concern: ALT.001 **Comment:** 054.037 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 43–44 **Org:** Minnesota Department of Public Service

State agencies believe that the issue of alternatives should be designated as Category 3 or Category 2 with bounding conditions. The analysis presented in the GEIS (Chapter 9) falls far short of providing the basis of decision making on whether to deny or approve applications for license renewal.

Concern: ALT.011 **Comment:** 054.038 **Subtopic:** Comparison of alternatives
Commenter: Kvalseth **Page:** 44–45 **Org:** Minnesota Department of Public Service

The NRC fails to assess combinations of wind, solar, hydro, biomass, and fossil fuel alternatives. This is a serious flaw. It neglects a utility's propensity to serve its customers with a portfolio of supply that is based on load characteristics, cost, geography, and other considerations.

Concern: ALT.026 **Comment:** 054.039 **Subtopic:** Wind power
Commenter: Kvalseth **Page:** 45–46 **Org:** Minnesota Department of Public Service

State agencies believe that the NRC's own analysis (see GEIS, pp. 9-1 to 9-5) indicates that wind power is a potential alternative that must be considered in the relevant timeframe. Given the potential of wind power in Minnesota, the NRC should not preclude consideration of this resource when considering the environmental impact of license renewal of nuclear plants in Minnesota. Furthermore, capital costs provided by the NRC are 112 to 150 percent those estimated in the report, "Minnesota's Wind Energy." Thus, the NRC should incorporate a sensitivity analysis using capital costs for wind power equal to $1.41/kW (single turbine cost) and $775/kW (100 unit cost) as provided in Minnesota's report. Also, the discussion of wind power siting in a forested region is highly improbable. Regarding loss of agricultural land as an impact, experience in California indicates that dual use of land for wind power and agriculture can actually increase land values.

Concern: ALT.023 **Comment:** 054.040 **Subtopic:** Photovoltaics
Commenter: Kvalseth **Page:** 47–48 **Org:** Minnesota Department of Public Service

NRC's brief assessment of solar photovoltaic systems fails to consider the possibility of significant technological change in coming decased or its effect on considering relicensing applications for plants located in areas of relatively greater solar photovoltaic potential. Present capital costs for solar photovoltaic capacity may be substantially overstated by the NRC. The NRC uses costs that are 145 percent of those used by other govemment utility regulators and neglects the possibility of declining costs in the future. Also, the NRC's analysis focuses only on large-scale facilities. No mention is made of multiple small solar systems capable of being located in many locations. The NRC's own estimate demonstrates that solar photovoltaic capacity in 2020 could provide one-eighth of the aggregate of the nuclear power lost should nuclear plant licenses not be renewed.

Concern: ALT.025 **Comment:** 054.041 **Subtopic:** Solar energy
Commenter: Kvalseth **Page:** 48 **Org:** Minnesota Department of Public Service

Conclusions reached in the GEIS regarding solar thermal power are also based on considering this alternative in isolation with other alternatives. As with solar photovoltaic systems, the NRC's assessment focuses on large-scale facilities. Many solar thermal applications are more like DSM. Consequently, environmental impact issues related to remote locations, transmission line corridors, and land use are all improperly addressed.

Concern: ALT.024 **Comment:** 054.042 **Subtopic:** Pumped hydro
Commenter: Kvalseth **Page:** 48–49 **Org:** Minnesota Department of Public Service

In combination with other alternatives, hydropower is a significant potential resource that should be considered in nuclear plant relicensing applications.

Concern: ALT.020 **Comment:** 054.043 **Subtopic:** Geothermal power
Commenter: Kvalseth **Page:** 49 **Org:** Minnesota Department of Public Service

The NRC must, at the very least, recognize that geothermal power must be assessed for plants in most States. Moreover, the GEIS excludes scenarios where geothermal energy production is part of a portfolio of alternatives. It also excludes use of low quality resources such as groundwater heat exchange heat pumps.

Concern: ALT.017 **Comment:** 054.044 **Subtopic:** Biomass energy/Categorization
Commenter: Kvalseth **Page:** 49–50 **Org:** Minnesota Department of Public Service

The discussion in the GEIS suggests the site-specific variability of biomass fuel. This means that the issue of alternatives cannot be defined as Category 1. Moreover, the NRC does not appear to consider a biomass fuel scenario using plantation wood production. Instead, it assumes that previously undisturbed land will be harvested for biomass fuel, resulting in associated negative impacts.

Concern: HHI.035	**Comment:** 054.045	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth	**Page:** 50–51	**Org:** Minnesota Department of Public Service

Of the 62 issues that involve human health, the NRC concludes that 49 could be addressed generically for all plants and the remaining 13 could be addressed generically for all but a subset of plants. The NRC implicitly assumes (1) that no new information of relevant significance will be available in the coming years to change the GEIS assumptions; and (2) that there are no specific sets of circumstances pertaining to particular generating plants, or their location, which are relevant to human health or health risk assessment. The Minnesota State agencies contend that these assumptions are wrong.

Concern: HHI.036	**Comment:** 054.046	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth	**Page:** 51	**Org:** Minnesota Department of Public Service

State agencies contend that the GEIS conclusion that the health impacts of license renewal are acceptable on the basis of a cost-benefit analysis is flawed. Changes in technology and power needs will impact the cost-benefit analysis for health risks. Low public tolerance of health risks from nuclear plants may further decline in view of the Federal government's inability to develop a HLW storage facility. Issues related to technological advances, power needs, and siting of waste storage facilities, as they relate to health cost and benefits and public tolerance to health risks, can be adequately addressed only in a site-specific and more timely EIS.

Concern: HHI.037	**Comment:** 054.047	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth	**Page:** 51–52	**Org:** Minnesota Department of Public Service

The GEIS and proposed rule have not considered Minnesota's position regarding dose-rate limits and public exposures, as required by NEPA. The Minnesota Department of Health (MDH) believes that equivalent health risk criteria must be used to compare health risks posed by alternative methods of power generation. The MDH has calculated an upper-bound lifetime cancer incidence risk coefficient for exposure to ionizing radiation and has applied its negligible risk criterion for exposures to such radiation. Risk coefficients for chemicals and radiation are used by MDH to obtain upper-bound risk estimates of cancer incidence. In contrast, the NRC's risk coefficients provide best or central estimates of cancer mortality.

Concern: HHI.038	**Comment:** 054.048	**Subtopic:** Radiation exposure-public/worker
Commenter: Kvalseth	**Page:** 52–53	**Org:** Minnesota Department of Public Service

State agencies noted that the NRC policy regarding cancer risk calculation and dose rate limits is changing. However, the NRC ignores the importance of these changes by failing to include in the GEIS and proposed rule a mechanism for revising the dose limits as new data becomes available and as societal views regarding acceptable risk evolve. The NRC also ignores its own most recent data in determining dose rate limits and risk estimates.

Concern: HHI.029 **Comment:** 054.049 **Subtopic:** Radiation exposure-public/worker
Commenter: Kvalseth **Page:** 53–54 **Org:** Minnesota Department of Public Service

The NRC arbitrarily chooses a risk coefficient of cancer fatalities per 10,000 people, each exposed to 1 rem (see Table 3.10). The most authoritative risk estimation values appear in the 1990 *Biological Effects of Ioninzing Radiation* (BEIR V) report, which shows 800 cancer fatalities per 100,000 people receiving an instantaneous dose of 10 rem. Moreover, in Table 3.9, the NRC presents a current design objective for annual dose limits to the general public of 8 mrem/year for total body exposure, but it retains for regulatory purposes a dose limit of 25 mrem/year. In order to attain the EPA's risk level goal of 1 in 10,000, and using the BEIR V estimates of cancer fatalities, the dose rate limit would be 1.8 mrem/year, as compared to the NRC's 25 mrem/yr dose limit and the EPA's 10 mrem/year dose limit. Neither the NRC's nor the EPA's limits approaches the Minnesota criterion of 0.054 mrem/year.

Concern: HHI.001 **Comment:** 054.050 **Subtopic:** Radiation exposure-public/worker
Commenter: Kvalseth **Page:** 54–55 **Org:** Minnesota Department of Public Service

The NRC incorrectly justifies its dose rate limits by comparing these limits with background radiation. The risk of radiation from licensed activities is incremental; therefore, levels of background radiation are irrelevant.

Concern: HHI.040 **Comment:** 054.051 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth **Page:** 55 **Org:** Minnesota Department of Public Service

Table E.19 on airborne emissions does not have any data for the Monticello or Prairie Island nuclear plants. Before either plant is relicensed, such data should be made available as part of an environmental review process and evaluated with respect to the Minnesota dose rate criterion of 0.054 mrem/year.

Concern: HHI.041 **Comment:** 054.052 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth **Page:** 55 **Org:** Minnesota Department of Public Service

Table 3.11B contains data for a few BWRs, including Monticello, on air and liquid releases of radionuclides. Before relicensing, data of this type needs to be evaluated in terms of possible impact on farming activities and food chain exposures in the areas surrounding the Monticello and Prairie Island plants. Additionally, the MDH is concerned that the statement, "The significance of any given nuclear power plant to its host area will depend to a large degree on its remoteness . . . ." may not be accurate (GEIS, p. 2-25). The potential impact of effluent releases is greatest in farming areas where food chain exposures to radionuclide emissions may occur. Further analysis of this issue must occur during individual plant relicensing.

Concern: GRW.007 **Comment:** 054.053 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 56 **Org:** Minnesota Department of Public Service

Before either Monticello or Prairie Island is relicensed, surface water, groundwater, and drinking water quality data specific to both plants must be evaluated and the health risks must be assessed. Making standard assumptions about water consumption of 2 liters/day results in a dose rate of 0.16 to 0.2 mrem/yr, which is 2 to 4 times Minnesota's criterion dose rate of 0.054 mrem/yr.

Concern: SWQ.004 **Comment:** 054.054 **Subtopic:** Water use conflicts-categorization
Commenter: Kvalseth **Page:** 56–57 **Org:** Minnesota Department of Public Service

Minnesota State agencies do not favor a nationwide generic analysis approach for relicensing, particularly as it applies to water use and water resource impacts. Due to hydrologic, geologic, and biologic conditions that are unique to Minnesota, there should be an individual environmental review for each facility or a statewide generic analysis for Minnesota facilities.

Concern: TEL.017 **Comment:** 054.055 **Subtopic:** Environmental review process
Commenter: Kvalseth **Page:** 57 **Org:** Minnesota Department of Public Service

While they do not dispute the GEIS findings on fish and wildlife issues at this time, the State agencies note that circumstances related to these issues change over time. Information from State fish and wildlife agencies must become part of the NRC's consideration of a license renewal application in a timely manner and without undue administrative burden.

Concern: AQE.005 **Comment:** 054.056 **Subtopic:** Aquatic issues-Reactor systems impacts on rivers and ecoregions
Commenter: Kvalseth **Page:** 57 **Org:** Minnesota Department of Public Service

The two nuclear plants in Minnesota are located in environmentally sensitive areas. The NRC must modify its proposal to ensure that the concerns of the State and other Federal agencies are adequately incorporated and addressed in the NRC's consideration of license renewal applications.

Concern: GRW.007 **Comment:** 054.057 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 58 **Org:** Minnesota Department of Public Service

The GEIS discussed groundwater quality impacts, but did not address the tritium found in the wells at Prairie Island. This incident should be included in the GEIS. Moreover, groundwater quality effects should be Category 3.

Concern: TEL.009 **Comment:** 054.058 **Subtopic:** Onsite land use
Commenter: Kvalseth **Page:** 58–59 **Org:** Minnesota Department of Public Service

The State agencies pointed out that relicensing of Monticello and Prairie Island (PI) nuclear plants must include a thorough analysis of all the future system requirements, such as a proposed transmission line crossing of the Mississippi River from the PI plant to the proposed Northern States Power generation site at Durand, Wisconsin; a new access road from Red Wing to the PI plant; dry cask storage of spent fuel rods; and a radio transmitter tower installed at PI.

Concern: AQE.018 **Comment:** 054.059 **Subtopic:** Aquatic issues-impacts on fisheries
Commenter: Kvalseth **Page:** 59 **Org:** Minnesota Department of Public Service

The extent to which thermal discharges from the Prairie Island plant affect the winter fishery needs to be further evaluated from both a biological and a recreational/sociological standpoint. Cumulative impact analysis needs to be done on larval fish mortality in the Mississippi River between St. Cloud and Coon Rapids. The Monticello plant, the SHERCO plant, and hydroelectric facilities impact large volumes of river water in this area. Larval and juvenile fish entrainment or impingement are ongoing concerns for resource managers and are tied to water withdrawal. Thus, alternative cooling system designs for the Monticello plant require adequate analysis, which would be unavailable under the proposed rule and GEIS.

Concern: AQE.019 **Comment:** 054.060 **Subtopic:** Cooling water issue
Commenter: Kvalseth **Page:** 60 **Org:** Minnesota Department of Public Service

A comprehensive analysis of the cooling water issue is needed to determine the optimum design and operation of a plant's cooling towers. Such analysis should include consideration of design modifications that would improve power generation efficiency while reducing the rejected heat in the river water cooling system. At Prairie Island, warm weather operation of the cooling towers has resulted in colonization of the system by a parasitic amoeba, which presents safety concerns for plant personnel. To address this, Northern States Power has been given permission to chlorinate the system. However, this results in considerable mortality of fish and other organisms within the recirculation canal. The immediate and long-term impacts of this action on the aquatic ecosystems must be addressed.

Concern: SWQ.012 **Comment:** 054.061 **Subtopic:** Cooling water systems
Commenter: Kvalseth **Page:** 60 **Org:** Minnesota Department of Public Service

Zebra mussels can block water intake systems. The imminent threat of zebra mussel infestation will likely require significant operational changes at the Prairie Island plant. The potential water quality impacts and cooling water system modifications need to be evaluated.

Concern: SWM.011 **Comment:** 054.062 **Subtopic:** Spent fuel
Commenter: Kvalseth **Page:** 61 **Org:** Minnesota Department of Public Service

On page 6-36, the GEIS should assess the likelihood of opening a spent fuel repository, and include in that analysis an indication of the timeframe for its opening. Timing and costs of delay incurred will affect the determination of need and the cost-effectiveness of alternatives.

Concern: SWM.011 **Comment:** 054.063 **Subtopic:** Spent fuel
Commenter: Kvalseth **Page:** 62 **Org:** Minnesota Department of Public Service

Current law limits the volume of Yucca mountain repository to 70,000 metric tons. The issue of the need for a second repository (since one repository will not be sufficient to hold the volume of spent fuel generated from current licensees) should be addressed in the GEIS, on page 6-36.

Concern: SWM.026 **Comment:** 054.064 **Subtopic:** Spent fuel
Commenter: Kvalseth **Page:** 62 **Org:** Minnesota Department of Public Service

With regard to the discussion in the GEIS, on page 6-36, each plant should be required, as part of its license renewal application, to indicate how spent fuel would be stored at each site until the DOE acceptance begins. The impacts of storage should be assessed both economically and environmentally.

Concern: SWM.027 **Comment:** 054.065 **Subtopic:** Spent fuel
Commenter: Kvalseth **Page:** 62 **Org:** Minnesota Department of Public Service

State agencies contend that the fact that each plant planning to use dry cask storage must obtain an NRC Part 72 license, which requires an environmental report, indicates that spent fuel storage should be a Category 3 issue.

Concern: SWM.028 **Comment:** 054.066 **Subtopic:** LLW disposal
Commenter: Kvalseth **Page:** 62 **Org:** Minnesota Department of Public Service

State agencies noted that all quantitative data reported in the GEIS tables should be as complete as possible in order to present an accurate picture of LLW generation by nuclear plants. The NRC should work closely with the compacts and unaffiliated States to justify and verify all the figures used.

Concern: SWM.029 **Comment:** 054.067 **Subtopic:** LLW disposal
Commenter: Kvalseth **Page:** 62–63 **Org:** Minnesota Department of Public Service

Section 6.3.3.3 of the GEIS states that "consummation of an agreement with (another) compact or unaffiliated State for interim storage could suffice" to provide disposal capacity to a plant's LLW. No such agreements have been worked out as yet, and it is unclear whether any compacts or

States with operational facilities would be amenable to this if approached. If that statement is to remain in the final GEIS, additional qualifying text should be included to fully explain these caveats and their implications.

Concern: SWM.005 **Comment:** 054.068 **Subtopic:** LLW disposal
Commenter: Kvalseth **Page:** 63 **Org:** Minnesota Department of Public Service

Most of the information on the Midwest Compact is out-of-date. Michigan has been expelled from the Compact and Ohio has been chosen as the new host State.

Concern: SWM.030 **Comment:** 054.069 **Subtopic:** LLW disposal
Commenter: Kvalseth **Page:** 63 **Org:** Minnesota Department of Public Service

The GEIS does not address the implications of LLW disposal over a longer period of time, the additional amounts of LLW from refurbishment activities, and the timing of the generation of decommissioning wastes on the compacts' planning and decision making activities.

Concern: SWM.031 **Comment:** 054.070 **Subtopic:** LLW storage/disposal
Commenter: Kvalseth **Page:** 63–64 **Org:** Minnesota Department of Public Service

A "rule of thumb" understanding between the NRC and the generators has been that onsite storage of LLW is limited to 5 years; the GEIS states that typical onsite storage is from 1 to 3 years. Moreover, the GEIS states that if offsite disposal facilities will not be available according to the schedule given in Table 6.8, then the effects of extended storage will need to be evaluated. The Minnesota State agencies believe that it is unlikely that disposal capacity will be available according to this schedule since progress in siting has been generally slow.

Concern: SWM.013 **Comment:** 054.071 **Subtopic:** Mixed waste
Commenter: Kvalseth **Page:** 64 **Org:** Minnesota Department of Public Service

It would be helpful to include a discussion of the recent EPA policy statement on mixed wastes, which states that although the Resource Conservation and Recovery Act (RCRA) does not allow for the long-term storage of mixed wastes, the EPA will consider enforcement under RCRA a low priority if the generator follows certain management practices described in the policy statement.

Concern: POA.004 **Comment:** 054.072 **Subtopic:** Categorization
Commenter: Kvalseth **Page:** 64 **Org:** Minnesota Department of Public Service

The GEIS's conclusion that the environmental impacts of postulated accidents are small at all sites is inconsistent with the NRC's own recognition that many plants do not fall within the bounds considered. Thus, the GEIS's generic findings cannot be applied to the environmental situation at all individual nuclear plants.

Concern: POA.004 **Comment:** 054.073 **Subtopic:** Categorization
Commenter: Kvalseth **Page:** 65 **Org:** Minnesota Department of Public Service

The GEIS accident analysis for "large water sites" fails to account for site-specific differences among nuclear plants. The Prairie Island and Monticello plants are much closer to the Mississippi River (150 meters) than the two river sites chosen for the analysis. The danger of accidents due to flooding could be very different for those plants nearer the river. Thus, the analysis of postulated accidents is site-specific.

Concern: POA.020 **Comment:** 054.074 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth **Page:** 65 **Org:** Minnesota Department of Public Service

Although a number of power plants, including Monticello and Prairie Island, are not bound by the study on aquatic food pathway risk, the GEIS concludes that the issue is low for all sites. Since analysis is not provided to show that interdiction of the fallout resulting from a nuclear accident is feasible and effective, this conclusion (Category 1 issue) is unfounded.

Concern: GRW.007 **Comment:** 054.075 **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 65 **Org:** Minnesota Department of Public Service

The conclusion that the issue of releases to groundwater at all plants is Category 1 is unfounded because a number of power plants fall outside the bounds of the analysis.

Concern: POA.033 **Comment:** 054.076 **Subtopic:** Local infrastructure
Commenter: Kvalseth **Page:** 66 **Org:** Minnesota Department of Public Service

The GEIS fails to consider the impact that changes in population density would have on risks associated with a particular nuclear plant. The GEIS neither considers that the population growth for specific plant areas may be within the 3-mile radius around the plant known as the low population zone, nor the potential growth in numbers of the transient as well as settled population in that area.

Concern: POA.033 **Comment:** 054.077a **Subtopic:** Local infrastructure
Commenter: Kvalseth **Page:** 66 **Org:** Minnesota Department of Public Service

When it generically concludes that the environmental impacts of postulated accidents are acceptable, the GEIS fails to consider that no Federal regulation requires an evacuation plan for people outside the 10-mile emergency planning zone.

Concern: POA.009 **Comment:** 054.077b **Subtopic:** Categorization of issues
Commenter: Kvalseth **Page:** 66 **Org:** Minnesota Department of Public Service

Generic accident analysis does not suffice when a particular nuclear plant, like Monticello, presents such site-specific population density differences from another nuclear plant.

Concern: POA.008 **Comment:** 054.078 **Subtopic:** Analysis of issues
Commenter: Kvalseth **Page:** 66 **Org:** Minnesota Department of Public Service

The GEIS erroneously states that spent fuel is handled and stored under water (p. 5-9). The GEIS also ignores the fact that nuclear plants are already beginning to use dry cask storage. This should be addressed in Chapter 5.

Concern: POA.023 **Comment:** 054.079 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Kvalseth **Page:** 67 **Org:** Minnesota Department of Public Service

The GEIS does not address possible time differences at which radioactive materials would escape from aging plant systems if a severe accident were to occur. This should be addressed in Chapter 5.

Concern: POA.002 **Comment:** 054.080 **Subtopic:** Severe accidents
Commenter: Kvalseth **Page:** 67 **Org:** Minnesota Department of Public Service

The economic effect of the determination of activities in a contaminated area has been calculated only for a one-year period after an accident. The NRC has not provided a basis for limiting the assumed effect of a nuclear accident to one year (see p. 5-91). The GEIS also fails to take into consideration the specific land usage in a particular State and the financial implications of public perception of the quality of life. Generalized severe accident analysis can be expected to mask significant land use anomalies near specific nuclear plants.

Docket Number: 055

Concern: NONE **Comment:** 055.001 **Subtopic:** Supportive statement
Commenter: Edwards **Page:** 2, 4 **Org:** Yankee Atomic Electric Company

An electric utility company supports the use of the generic rulemaking process for license renewal. He believes that a lead plant demonstration of this process will remove many of the uncertainties that plagued the initial implementation of U.S. nuclear power. Additionally, he believes that many of the costs associated with building the plants can be avoided since many of those early uncertainties are now known.

Concern: NGC.004 **Comment:** 055.002 **Subtopic:** State participation
Commenter: Edwards **Page:** 2 **Org:** Yankee Atomic Electric Company

An electric utility company suggested that the NRC clarify State participation in license renewal issues, such as need for power and alternatives. He believes the State has the right to regulate all decisions regarding the generating facilities selected to satisfy economic objectives and regional energy needs and that the GEIS needs to reiterate this. (This is similar to Comment 057.001.)

Concern: NEP.003 **Comment:** 055.003 **Subtopic:** NRC/State review procedure
Commenter: Edwards **Page:** 2 **Org:** Yankee Atomic Electric Company

An electric utility company requested that the GEIS clarify what plant-specific information analyses would be required from an applicant for license renewal to assist the NRC in satisfying NEPA responsibilities. Additionally, he suggested that the NRC scrutinize the transcripts from Sessions 12 and 13 of the Workshop, where this issue was introduced.

Concern: NEP.014 **Comment:** 055.004 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Edwards **Page:** 2–3 **Org:** Yankee Atomic Electric Company

An electric utility company objects to the use of bounding criteria in the GEIS and suggests that individual impacts be addressed with representative impacts instead of bounds. He suggested that, where appropriate, maximum or minimum estimates could be used as a means of establishing a sensitivity analysis.

Concern: SOE.001 **Comment:** 055.005 **Subtopic:** Transportation-categorization
Commenter: Edwards **Page:** 3 **Org:** Yankee Atomic Electric Company

An electric utility company disagrees with the bounding assumptions used in determining the transportation categorization. The GEIS assumes that a 9-month outage is required immediately preceding license renewal for equipment replacement which causes a local transportation problem. Past outages for equipment replacements have not produced this theorized transportation problem. Furthermore, the entire philosophy of license renewal is a continuum of operation not a new plant start-up.

Concern: SWM.036 **Comment:** 055.006 **Subtopic:** LLW disposal
Commenter: Edwards **Page:** 3 **Org:** Yankee Atomic Electric Company

An electric utility company disagrees with the bounding assumptions used in determining LLW disposal. He believes that the upper limits used for generated LLW are very conservative and that this could raise unwarranted concerns and unjustified resistance to the general concept of license renewal.

Concern: TEL.001 **Comment:** 055.007 **Subtopic:** Threatened & endangered species
Commenter: Edwards **Page:** 3 **Org:** Yankee Atomic Electric Company

An electric utility company suggested that endangered species be recategorized from Category 3 to Category 2. He believes that currently, the location of endangered species and effects that nuclear plants may have on them is well catalogued and that this issue can be enveloped.

Docket Number: 056

Concern: NEP.015 **Comment:** 056.001 **Subtopic:** Documentation
Commenter: Deason **Page:** 1 **Org:** U.S. Department of the Interior

A Federal agency believes that even if a generic impact statement is used for license renewal, each applicant should be required to confim these conclusions with documentation, including the results of consultation with appropriate local, State, and Federal agencies at the time of license renewal. Furthemore, the agency believes all adverse impacts associated with relicensing, regardless of magnitude, must be addressed. Any decision to eliminate "small" impacts from consideration must be based on consultation with and concurrence from the appropriate agencies.

Concern: NEP.016 **Comment:** 056.002 **Subtopic:** Compliance with other regulations
Commenter: Deason **Page:** 1 **Org:** U.S. Department of the Interior

A Federal agency noted that it requires that Federal permit renewals, such as plant relicensing, be reviewed at permit renewal time in compliance with the Mitigation Policy of 1981. This policy provides guidance in recommending appropriate mitigation measures for all land and water developments that would affect U.S. waters and require a Federally-issued permit or license.

Concern: NONE **Comment:** 056.003 **Subtopic:** Threatened & endangered species
Commenter: Deason **Page:** 2, 5 **Org:** U.S. Department of the Interior

A Federal agency agrees with the GEIS categorization of this issue and provision that each plant applying for license renewal must contact the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Services (NMFS), as appropriate, to determine whether threatened or endangered species are known to occur in the project area. Furthemore, if these species are present, the NRC must consult with the agency in compliance with Section 7 of the Endangered Species Act, to determine if a biological assessment is required. Furthemore, the agency reiterated its stand that a generic analysis will not meet the requirement for analyzing threatened and endangered species in response to question 6 in the *Federal Register* notice.

Concern: AQE.006 **Comment:** 056.004 **Subtopic:** Aquatic issues-impacts on aquatic systems

Commenter: Deason **Page:** 2–3 **Org:** U.S. Department of the Interior

A Federal agency believes that entrainment, impingement, and thermal effluent issues should be addressed in each relicense application. Relicense applicants should consult with the appropriate State and Federal agencies regarding identification of concerns associated with project water intakes and discharges. Conflicts about water use issues would be resolved by the utility and appropriate State and Federal agencies, and these types of issues should be addressed in future project-specific relicensing documents.

Concern: TEL.004 **Comment:** 056.005 **Subtopic:** Bird collisions-cooling towers/power lines

Commenter: Deason **Page:** **Org:** U.S. Department of the Interior

A Federal agency disagrees with the GEIS conclusion that bird collisions with cooling towers and transmission lines require no further consideration or mitigation. The agency recommended that license renewal applicants coordinate this issue with the DOI and appropriate State fish and wildlife agencies at time of renewal.

Concern: TEL.011 **Comment:** 056.006 **Subtopic:** Herbicides and pesticides

Commenter: Deason **Page:** 3–4 **Org:** U.S. Department of the Interior

A Federal agency disagrees with the GEIS assumption that herbicides, when properly applied, generally are not toxic to wildlife and pointed out the following: (1) herbicide toxicity has only been tested on a few wildlife species; (2) most laboratory tests are on active ingredients rather than formulated products, and the constituents in formulated products may enhance the toxicity of a pesticide; (3) the common laboratory endpoints do not fully elucidate the effects of pesticides under actual exposure conditions and other concerns, including sublethal effects, need to be considered; (4) environmental effects of herbicides are not limited to terrestrial wildlife; (5) non-target plants, including endangered species, can be adversely affected by right-of-way (ROW) management, including herbicide use; (6) fish and wildlife species can be directly harmed from ROW maintenance when food or habitat are destroyed or altered; and (7) some pesticides used for ROW maintenance have significant environmental concerns associated with them such as persistence and groundwater contamination. The agency also disagrees with the GEIS conclusion on page 4-61, lines 37–39. It is very concerned about the effect of pesticides on fish and wildlife. The GEIS incorrectly states that the toxic effects on wildlife are generally of little concern to wildlife biologists or wildlife managers.

Concern: TEL.015 **Comment:** 056.007 **Subtopic:** Power lines

Commenter: Deason **Page:** 4 **Org:** U.S. Department of the Interior

A Federal agency disagrees with the GEIS assumption that the impacts of transmission line ROW management to wildlife require no further consideration or mitigation, and would like this issue recategorized because these impacts may be important on site-specific and cumulative bases.

Concern: REG.008 **Comment:** 056.008 **Subtopic:** Threatened & endangered species
Commenter: Deason **Page:** 4 **Org:** U.S. Department of the Interior

A Federal agency disagrees with the GEIS definition of "important" species and suggested that the NRC consider incorporating the definition used in the Mitigation Policy of 1981 into the review plan.

Concern: REG.002 **Comment:** 056.009 **Subtopic:** DG-4002-Editorial comments
Commenter: Deason **Page:** 5 **Org:** U.S. Department of the Interior

A Federal agency believes the GEIS does not adequately address thermal effects. They believe that each license renewal applicant must include an analysis of thermal effects in compliance with 50 CFR Part 402.

Concern: REG.007 **Comment:** 056.010 **Subtopic:** Threatened & endangered species
Commenter: Deason **Page:** 5 **Org:** U.S. Department of the Interior

A Federal agency disagrees with Section 2.11 of DG-4002 which includes the requirement to report proposed mitigation measures to minimize potential impacts on threatened and endangered species or their habitat. Mitigation is inappropriate for Federal activities affecting listed species or their critical habitat.

Concern: AQE.005 **Comment:** 056.011 **Subtopic:** Aquatic issues-Reactor systems impacts on rivers and ecoregions
Commenter: Deason **Page:** 5 **Org:** U.S. Department of the Interior

A Federal agency suggests that the NRC consider the cumulative effects of continued operation of a nuclear plant on current conditions of a river basin or ecoregion. For example, individual power plants on rivers or lakes with multiple plants should be assessed for cumulative effects to the ecological system.

Concern: TEL.003 **Comment:** 056.012 **Subtopic:** Threatened & endangered species
Commenter: Deason **Page:** 5, 6 **Org:** U.S. Department of the Interior

A Federal agency would like the proposed Part 51 rule to address terrestrial ecology more specifically. It suggests that the rule require consultation with the DOI and other appropriate agencies for each plant having "important terrestrial resources" in the project area. Additionally, it recommended that the "important terrestrial resource" list be expanded to include migratory birds and avian species of special concern on State, regional, and national levels.

Concern: TEL.010 **Comment:** 056.013 **Subtopic:** Habitat restoration programs
Commenter: Deason **Page:** 6 **Org:** U.S. Department of the Interior

A Federal agency pointed out that the DOI and various State agencies are currently working on anadromous fish and waterfowl habitat restoration programs which include areas and river systems near nuclear plants. These alterations are covered by an NPDES permit; however, they must also be identified and discussed in plant license renewal to determine whether changes in facility operations or structures for individual power plants may now be necessary.

Concern: ALT.019 **Comment:** 056.014 **Subtopic:** Cogeneration
Commenter: Deason **Page:** 6 **Org:** U.S. Department of the Interior

A Federal agency recommends that the NRC consider alternatives that decrease potential ongoing and future environmental impacts, such as combined cycle cogeneration, which requires less water and has fewer impacts on fisheries than existing nuclear power generation technology.

Concern: NEP.015 **Comment:** 056.015 **Subtopic:** Documentation
Commenter: Deason **Page:** 6 **Org:** U.S. Department of the Interior

A Federal agency responded to question 1 in the *Federal Register* that asked if the proposed rule could be supported by a technical study or would a GEIS or an EA be required. The agency stated that appropriate environmental documentation for the license renewal decision should be prepared. Technical studies may not suffice for NEPA compliance. Alternative analyses during part of the documentation process should be required.

Concern: GIS.009 **Comment:** 056.016 **Subtopic:** Nuclear power plants covered by GEIS
Commenter: Deason **Page:** 7 **Org:** U.S. Department of the Interior

In response to question 7 in the *Federal Register* that requested criteria to judge environmental impacts, a Federal agency recommended that Washington Nuclear Plants 1 and 2, Grand Gulf 2, and Perry 2 not be considered in the scope of the GEIS relicensing action if new information on resources exist, project plans change or have changed since the last NEPA document, or significant impacts to the environment are involved.

Docket Number: 057

Concern: NGC.004 **Comment:** 057.001 **Subtopic:** State participation
Commenter: Schrock **Page:** 1 **Org:** Wisconsin Public Service Corporation

A State agency endorses the NUMARC comments to the NRC on the proposed rulemaking dated March 13, 1992 (Docket No. 63). In particular, he believes that the State should have the continued right to regulate utilities based on State-level economic objectives, energy needs, and

mix of generation requirements. Furthermore, he supports incorporation of wording into Section 51.95(c) of the proposed Part 51 rule that socioeconomic questions such as "need for additional generating capacity, the type of generating facilities to be licensed, land use, rulemaking, and the like" be reserved for the States as stated by the Supreme Court, and referenced in the NUMARC comment letter.

Docket Number: 058

Concern: NONE	**Comment:** 058.001	**Subtopic:** References Docket 63
Commenter: Woodard	**Page:** 1	**Org:** Southern Nuclear Operating Company

An electric utility company strongly endorses the NUMARC comments on the proposed Part 51 rule dated March 13, 1992 (Docket No. 63).

Docket Number: 059

Concern: NEP.005	**Comment:** 059.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Berwick	**Page:** 1	**Org:** Environmental Protection Division, Office of Attorney General, MA

A State agency concurs with the concerns expressed in the joint comments submitted by the Attorneys General of Minnesota and other States on the proposed Part 51 rule. The adoption of the proposed rule would create significant barriers to local governmental and public input into the environmental evaluations that will occur when nuclear plants apply to renew their operating license. The proposed Part 51 rule is also unacceptable because it treats several issues as generic, which instead should be addressed on a site-specific basis. Furthermore, the agency urges the NRC not to adapt the proposed rule since nuclear plant relicensing is a complex matter, requiring the close analysis of alternatives and site-specific issues.

Concern: ALT.011	**Comment:** 059.002	**Subtopic:** Comparison of alternatives
Commenter: Berwick	**Page:** 2	**Org:** Environmental Protection Division, Office of Attorney General, MA

A State agency believes that there should be more comparative analyses of the license renewal alternative to other sources of fuel, particularly with regard to the health impact of radiation exposure from operating plants using alternative fuels. It pointed out that under NEPA, "a determination must be made as to whether the proposed action may bring about changes in the environment and an assessment of alternatives must be conducted."

Concern: SWM.001
Commenter: Berwick

Comment: 059.003
Page: 2

Subtopic: LLW storage/disposal
Org: Environmental Protection Division, Office of Attorney General, MA

A State agency believes that the analysis of LLW disposal should be perfomed on a site-specific basis. The analysis should include a comparison of waste generated from the use of other sources of fuel. Moreover, it disagrees with the NRC's finding that LLW is amenable to a generic treatment based on the presumption that there will be local compacts or individual State sites available to accept LLW since there is no assurance that, at the time of relicensing of individual plants, there will be adequate LLW disposal sites to receive the additional waste generated from extended operation.

Concern: POA.010
Commenter: Berwick

Comment: 059.004
Page: 3

Subtopic: Analysis-approach, assumptions, and data
Org: Environmental Protection Division, Office of Attorney General, MA

A State agency believes that the analysis of postulated accidents is flawed because it is only based on the consequences of accidents occurring at relicensed nuclear plants. Rather, a comparison must be made of accidents at nuclear plants with those at plants operating on alternative fuels. Moreover, the GEIS analysis focuses only on the small risk of an accident and does not include the environmental and public health consequences if such accidents were to occur.

Concern: ALT.011
Commenter: Berwick

Comment: 059.005
Page: 3

Subtopic: Comparison of alternatives
Org: Environmental Protection Division, Office of Attorney General, MA

A State agency criticized the analysis of alternatives as being too limited to be of any value. Specifically, the comparison is limited only to coal-fired plants. The GEIS "never seriously considers" other less polluting alternatives such as natural gas. It also does not consider potential advances in technology over the next 40 years that may permit more efficient operation of alternative energy sources such as wind or geothermal power.

Concern: SOE.004
Commenter: Berwick

Comment: 059.006
Page: 3–4

Subtopic: Local infrastructure
Org: Environmental Protection Division, Office of Attorney General, MA

A State agency disagrees with the use of a GEIS because it cannot take into account the changes that will occur in the environs of nuclear plants over the next 40 years; rather, it is premised on the past operation of nuclear plants. The State agency believes that site-specific analyses of changing demographic patterns should be developed in addressing such issues as severe accidents, the social and economic effects of relicensing, public health effects, and decommissioning.

Concern: NGC.004 **Comment:** 059.007 **Subtopic:** State participation
Commenter: Berwick **Page:** 4–5 **Org:** Environmental Protection Division, Office of Attorney General, MA

A State agency disagrees with the GEIS approach that need for energy capacity can be dealt with generically. Energy needs forecasting has frequently been flawed even when predicting energy needs over a relatively short period of time. The agency believes that the proposed Part 51 rule does not contain a reliable assessment of whether there will be an energy demand in the particular energy market serviced by a nuclear plant at the time of relicensing.

Concern: POA.033 **Comment:** 059.008 **Subtopic:** Local infrastructure
Commenter: Berwick **Page:** 3 **Org:** Environmental Protection Division, Office of Attorney General, MA

A State agency commented that the failure to account for changes in population patterns around individual plants is a significant flaw in the analysis contained in the GEIS. Population distribution has historically been a critical factor to be considered in developing EISs for initial siting decisions for nuclear plants.

Docket Number: 060

Concern: NEP.005 **Comment:** 060.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Humphrey et al. **Page:** 1–10 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States expressed concern that the proposed rule "violates NEPA because State and local participation in the environmental review is substantially eliminated." As proposed, 80 environmental issues are designated as Category 1 and are found to be environmentally acceptable, and in proposed 10 CFR 51.53(c)(3), individual license renewal applicants are not required to address these issues at all. Also, Category 2 issues need not be discussed by applicants provided they satisfy the guidelines specified in 10 CFR 51.53(c)(3)ii(a–j). Thus, in a site-specific relicensing process, NRC will only analyze and evaluate the two issues designated as Category 3. They believe that with this process, the proposed rule essentially represents the "final environmental analysis for the vast majority of environmental impacts caused by the relicensing of nuclear power plants." This virtually eliminates opportunities for State and local governments to participate in the EA process. The local public will not be able to make site-specific comments on the major bulk of environmental impact issues. The commenters cite specific sections of NEPA that clearly state that NEPA policies are to be developed and implemented "in cooperation with State and local governments and other concerned public and private organizations." In addition, "aside from violating NEPA, this elimination of citizen input will tend to cause nuclear power to be viewed with even more suspicion." Moreover, because there are only two issues designated as Category 3, they believe that it is unlikely that the NRC

will prepare a site-specific EIS. Thus, without a Federal EIS, there is no need for cooperation with the States.

Concern: ALT.002 **Comment:** 060.002 **Subtopic:** State's responsibilities
Commenter: Humphrey et al. **Page:**1;10–14;1–22 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States believe that the designation of the issue of alternatives to license renewal analysis as Category 1 eliminates the consideration of alternatives to nuclear power in the EA process. This proposed action is "contrary to the mandate of the CEQ rules that Federal agencies consider alternatives to the fullest extent possible." Although the proposed rule requires a license applicant to perform an economic threshold analysis to ensure that no cost advantage exists by replacing the plant's generating capacity with a new coal-fired plant, this provision is not complete since there are other energy alternatives to nuclear power. "Since availability and costs associated with various alternatives vary tremendously from State-to-State, a generic determination is inappropriate." Moreover, commenters questioned why the NRC added the provision for an economic threshold analysis when as a Category 1 issue, alternatives need not be addressed on a plant-specific basis. Determination of alternatives is a State's responsibility "because it involves economic choices both between competing technologies and the assessments of the costs to the environment of nuclear power generation." Thus, they believe that the alternatives issue should be designated as Category 3.

Concern: GIS.012 **Comment:** 060.003 **Subtopic:** Cost-benefit analysis
Commenter: Humphrey et al. **Page:** 1–2; 12–13 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States noted that, in the analysis of alternatives, the costs included in nuclear production should not be limited to the direct costs (as identified in the GEIS). A particular State may find that costs include damages to the environment in addition to the direct costs of generating electricity. Additionally, local citizens have "the right to evaluate costs associated with the overall environmental effects of particular plants as well as the uncertainty of costs associated with the storage of nuclear waste."

Concern: NEP.006 **Comment:** 060.004 **Subtopic:** Periodic assessments
Commenter: Humphrey et al. **Page:** 15–18 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States noted that the rule's methodology is unnecessarily rigid with regard to new scientific information that may arise before a plant's license renewal actually begins because the NRC will be unable to respond easily to new information or to different environmental issues that are not listed in the proposed rule. Thus, incorporation of new information can only be achieved through the process of amending the rules.

Concern: NEP.007 **Comment:** 060.005 **Subtopic:** Cumulative impacts
Commenter: Humphrey et al. **Page:** 18 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States were concerned that the proposed rule does not provide a mechanism for interaction among the various environmental issues. Under NEPA, Federal agencies must also determine the cumulative effects of a program. Individual environmental effects may be small, but through interaction the cumulative effects may be significant. A case-by-case evaluation is necessary to explore how the issues identified in the GEIS might interact in particular cases.

Concern: NEP.005 **Comment:** 060.006 **Subtopic:** Public participation/site-specific EISs
Commenter: Humphrey et al. **Page:** 19–20 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States believe that the "generic approach may offer modest gains in administrative efficiency which are over-balanced by the predominance of non-generic issues, inflexibility of process, and lack of public participation."

Concern: NGC.004 **Comment:** 060.007 **Subtopic:** State participation
Commenter: Humphrey et al. **Page:** 20–21; 23 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States believe that designating need for generating capacity as Category 1 impinges on State authority. Determination of need is traditionally a State concern as discussed by the Supreme Court in the *Pacific Gas & Electric* case. Thus, this should be a Category 3 issue.

Concern: NEP.001 **Comment:** 060.008 **Subtopic:** Purpose or use of GEIS
Commenter: Humphrey et al. **Page:** 15–16 **Org:** Attorneys General of the States of Minnesota, Connecticut, New York, Vermont, and Wisconsin

The Attorneys General of 5 States stated that using the generic findings made in the GEIS as a basis for codifying by rule the treatment of NEPA issues exceeds the NRC's discretionary authority and is inconsistent with the Supreme Court's ruling in *Baltimore Gas and Electric Co. v. National Resources Defense Council*, 462 U.S. 87 (1983). In that ruling the Supreme Court upheld an NRC rule establishing that permanent storage of radioactive waste would have no environmental impacts, and would not affect whether a particular plant would be licensed.

Concern: NEP.005	**Comment:** 061.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Hiatt	**Page:** 1	**Org:** Ohio Citizens for Responsible Energy

A public interest group is opposed to the proposed GEIS rulemaking, and recommends that the NRC require the full consideration of all NEPA issues on a case-specific basis.

Concern: ALT.011	**Comment:** 061.002	**Subtopic:** Comparison of alternatives
Commenter: Hiatt	**Page:** 1	**Org:** Ohio Citizens for Responsible Energy

A public interest group indicated that the NRC may have erred in its analysis of alternatives to license renewal. While examining the capability of individual technologies to replace nuclear power, the NRC failed to consider the collective impact of alternatives. The projections in the GEIS for contributions from alternate sources (pp. 9-5 to 9-18) collectively represent over 110 percent of the energy generated by nuclear power.

Concern: ALT.029	**Comment:** 061.003	**Subtopic:** Solar energy
Commenter: Hiatt	**Page:** 1–2	**Org:** Ohio Citizens for Responsible Energy

A public interest group indicated that the potential contribution of solar energy as an alternative to nuclear power may be greater than that stated in the GEIS. Whereas the GEIS assumes that solar thermal energy must be converted to electricity, it ignores the optimal use of solar technology, i.e., point-of-use installation of rooftop collectors. The direct use of solar energy for space and water heating is more efficient than conversion to electricity, and the installation of collectors on rooftops precludes the need for large remote "farms". Therefore, the NRC's analysis may have underestimated the potential of this technology.

Concern: ALT.030	**Comment:** 061.004	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Hiatt	**Page:** 2	**Org:** Ohio Citizens for Responsible Energy

A public interest group is concerned that the NRC may have failed to consider conservation, efficiency, and storage technologies (e.g., pumped storage) as alternatives to license renewal.

Concern: ALT.001	**Comment:** 061.005	**Subtopic:** Categorization of issues
Commenter: Hiatt	**Page:** 3	**Org:** Ohio Citizens for Responsible Energy

A public interest group commented that the uncertainties in predicting the need for generating capacity dictates that the NEPA process of evaluating impacts and alternatives be done on a plant-specific basis, and at a point in time closer to the renewal decision.

Concern: NRR.002 **Comment:** 061.006 **Subtopic:** GEIS approach
Commenter: Hiatt **Page:** 3 **Org:** Ohio Citizens for Responsible Energy

A public interest group commented that the NRC's optimistic findings on the benefits and costs of license renewal were not shared by the owners of the Yankee Rowe plant, where the cost of continued operation was too great even under the existing license. The commenter believes that this situation underscores the need for plant-specific impact evaluation at the time of license renewal.

Concern: POA.011 **Comment:** 061.007 **Subtopic:** SAMDAs
Commenter: Hiatt **Page:** 3 **Org:** Ohio Citizens for Responsible Energy

A public interest group indicated that the proposed rule is inconsistent with the Court's decision in *Limerick Ecology Action v. NRC*, which specifically found that NEPA required case-specific consideration of SAMDAs. The commenter believes that these matters cannot be considered generically, but rather on a case-by-case basis. Additionally, severe accident risk will be affected by such plant-specific conditions as plant design variation, local population, and meteorological factors. Since severe accidents are site-specific, it is important for persons in the vicinity of the site to have the opportunity to comment upon and litigate these matters.

Concern: ALT.031 **Comment:** 061.008 **Subtopic:** Analysis of alternatives/site-specific analysis
Commenter: Hiatt **Page:** 4 **Org:** Ohio Citizens for Responsible Energy

A public interest group commented that it is essential to examine all the available options for generating electricity on a site-specific basis which includes (1) the costs and benefits of incorporating SAMDAs in existing facilities, (2) license renewal without incorporating SAMDAs, (3) building a new nuclear power plant, and (4) using non-nuclear generating capacity. The commenter believes this is the only way to fulfill NEPA's mandate to assess alternatives.

Concern: POA.012 **Comment:** 061.009 **Subtopic:** SAMDAs
Commenter: Hiatt **Page:** 4 **Org:** Ohio Citizens for Responsible Energy

A public interest group is concerned that the $1,000 per person-rem averted criterion in the GEIS is inappropriate because (1) it is not adjusted for inflation, and (2) licensees are willing to spend much more than that amount to avert occupational doses. It cites the industry health physics costs of $8,000 per person-rem averted found in NUREG-1362. Using these higher criteria, SAMDAs may well be cost effective.

Concern: HHI.010 **Comment:** 061.010 **Subtopic:** Electromagnetic fields impacts
Commenter: Hiatt **Page:** 4 **Org:** Ohio Citizens for Responsible Energy

A public interest group believes that the GEIS is flawed in its treatment of the chronic health effects of EMFs. While there are obvious uncertainties in our understanding of these effects, the

proposed rule cuts off any further consideration of the issues unless the NRC decides that new evidence warrants reconsideration. The commenter believes that the NRC should hold off on making generic findings regarding the health effects of EMFs until there is more study and research.

Concern: GIS.009	**Comment:** 061.011	**Subtopic:** Nuclear power plants covered by GEIS
Commenter: Hiatt	**Page:** 4	**Org:** Ohio Citizens for Responsible Energy

A public interest group commented that the scope of the GEIS should not include Washington Nuclear Plant Units 1 and 3, Grand Gulf Unit 2, or Perry Unit 2. Grand Gulf has been officially canceled, and it is likely that the remaining units will meet the same fate.

Concern: GIS.008	**Comment:** 061.012	**Subtopic:** Corrections
Commenter: Hiatt	**Page:** 5	**Org:** Ohio Citizens for Responsible Energy

A public interest group noted a possible error in the GEIS. On pages 2-5 and A-49, it should indicate that the nearest city to the Perry Nuclear Power Plant is Mentor, OH. Mentor is located about 12 miles from the plant (much closer than Euclid), and has a current population of about 46,700.

Docket Number: 062

Concern: NRR.003	**Comment:** 062.001	**Subtopic:** Application timing
Commenter: Cupit	**Page:** 1	**Org:** Minnesota Environmental Quality Board

A State agency transmits a letter from a State resident (R. Synder) who is concerned about allowing nuclear power plants to apply for license renewal up to 20 years before their current license expires. She believes that it is wiser to see what happens during the current license period and have the plants undergo a comprehensive evaluation at the time the original license expires.

Concern: NEP.005	**Comment:** 062.002	**Subtopic:** Public participation/site-specific EISs
Commenter: Cupit	**Page:** 1	**Org:** Minnesota Environmental Quality Board

A State agency transmits a letter from a State resident (R. Synder) who is concerned that there is insufficient public participation in the proposed rulemaking for license renewal.

Concern: NONE
Commenter: Rasin
Comment: 063.001
Page: E1.1–1.2
Subtopic: Supportive statement
Org: Nuclear Management and Resources Council

NUMARC strongly supports the NRC's use of the generic rulemaking process in its NEPA review of potential environmental impacts associated with license renewal. It believes that the generic rulemaking meets the legal requirements of NEPA, and that the NRC has adequately discharged its obligations under NEPA to establish a process which will assure adequate public disclosure, meaningful evaluation of environmental impacts, and adequate public participation.

Concern: GIS.013
Commenter: Rasin
Comment: 063.002
Page: E1.2
Subtopic: Rulemaking & GEIS approach
Org: Nuclear Management and Resources Council

NUMARC commented that the final rule on Part 51 should make clear that only those environmental impacts in Categories 2 and 3 attributable to extended unit operation are appropriate for examination in connection with individual license renewal reviews. This approach would provide consistency in the approaches for Parts 51 and 54.

Concern: NONE
Commenter: Rasin
Comment: 063.003
Page: E1.2
Subtopic: Supportive statement
Org: Nuclear Management and Resources Council

NUMARC commented that the NRC has the discretion to determine whether an EIS is necessary to support license renewal for individual license renewal proceedings. They believe that mandating an EIS in the context of every license renewal application is not an administratively efficient means of serving NEPA's purpose, and would result in a costly use of public resources without obtaining a commensurate benefit from the process.

Concern: NGC.004
Commenter: Rasin
Comment: 063.004
Page: E1.3–1.4
Subtopic: State participation
Org: Nuclear Management and Resources Council

NUMARC supported the NRC position that the proposed rule and its supporting activities have preserved the public's opportunity to participate in the license renewal process. They believe that the NRC should, however, clarify the scope of issues which it may consider at an individual license renewal proceeding. Specifically, the GEIS should include a discussion regarding need for power and alternative energy sources which stipulates that the NRC's conclusions are only an attempt to provide a basis on which to evaluate the benefits of license renewal with respect to the environmental costs. The GEIS should further specify that its conclusions are not intended to be binding on State governments considering the same issues in connection with State proceedings. They recommended the insertion of the same language as is contained in the proposed

Section 51.95(b) (excluding consideration of the need for energy, alternatives, and storage of spent fuel) into the proposed Section 51.95(c).

Concern: LIR.001
Commenter: Rasin
Comment: 063.005
Page: E1.4
Subtopic: Refurbishment schedule
Org: Nuclear Management and Resources Council

NUMARC commented that in the GEIS it is not consistently clear where the NRC has used a bounding analysis or has evaluated impacts on the basis of average, representative or some other qualitative or quantitative value. They believe that the GEIS should be revised to clearly indicate the analytical technique used, keeping in mind that there is no requirement that the GEIS use the most conservative values for all sites.

Concern: NEP.013
Commenter: Rasin
Comment: 063.006
Page: E1.4–1.5
Subtopic: Periodic assessments
Org: Nuclear Management and Resources Council

NUMARC took exception to the NRC's position to revisit the GEIS's conclusions at some future point in time. The group strongly urges the NRC both to make it clear that any reevaluation of the GEIS would be outside of individual licensing proceedings, and to not adopt a policy to reexamine these findings at an arbitrary and fixed frequency. Rather, a threshold test for reexamination should be whether any new information is relevant and if it is of such significance that, had it been known when the issues were evaluated for the original GEIS, it may have changed the outcome of the NRC's determination on a particular issue.

Concern: NEP.007
Commenter: Rasin
Comment: 063.007
Page: E1.5
Subtopic: Cumulative impacts
Org: Nuclear Management and Resources Council

NUMARC commented that the proposed Part 51 should be clarified to explain the manner in which the cumulative environmental impacts of simultaneous relicensing of several nuclear plants are addressed. The final rule should contain a full explanation of the process to ensure that an adequate cost-benefit evaluation was completed, including the consideration of cumulative impacts.

Concern: SWM.008
Commenter: Rasin
Comment: 063.008
Page: E1.5
Subtopic: Spent fuel and LLW
Org: Nuclear Management and Resources Council

NUMARC recommended that the NRC conduct a sensitivity analysis to validate the applicability of the data underlying Table S-3 to license renewal. The GEIS should make explicit Table S-3's applicability to license renewal.

Concern: POA.028 **Comment:** 063.009 **Subtopic:** Severe accidents
Commenter: Rasin **Page:** E1.6–1.7 **Org:** Nuclear Management and Resources Council

NUMARC believes that the NRC has correctly concluded that the environmental impacts of severe accidents can be characterized as Category 1. However, in order to satisfy NEPA requirements, the NRC should specifically provide the bases that it relied upon to support its determination. The group believes that the validity of the generic finding depends upon the adequacy of the severe accident data used in the GEIS analysis, derived both from WASH-1400 and from the application of the WASH-1400 data in the final environmental impact statement (FEIS) evaluations of the 27 plants listed in Table 5.1. The NRC should explain why the 27 FEIS analyses are sufficient to support the determination. The GEIS should also delineate the extent that the WASH-1400 evaluation overstates the severe accident source term since the NRC is relying upon safety improvements and enhancements included in the current licensing bases that would not be reflected in the WASH-1400 analysis as a source of further risk reduction. NUMARC also indicated that while the use of worst-case source terms would clearly bound the analysis to support a generic conclusion, this approach would go well beyond what NEPA requires. Instead, NUMARC recommended the use of average or representative values to cover all sites. If such data is not available, the NRC should develop an alternative basis on which to draw their conclusions.

Concern: NONE **Comment:** 063.010 **Subtopic:** Supportive statement
Commenter: Rasin **Page:** E2.1 **Org:** Nuclear Management and Resources Council

This comment was previously addressed in comment 063.003.

Concern: NONE **Comment:** 063.011 **Subtopic:** Supportive statement
Commenter: Rasin **Page:** E2.2 **Org:** Nuclear Management and Resources Council

NUMARC agreed with the NRC position that the use of the Exposure Index (EI) method combined with a 95 percent upper-bound regression would be expected to produce conservative results for the consequences of atmospheric releases. They believe that the methodology is acceptable for presenting the potential impacts from severe accidents of atmospheric releases for all plants for the license renewal period.

Concern: NONE **Comment:** 063.012 **Subtopic:** Supportive statement
Commenter: Rasin **Page:** E2.2 **Org:** Nuclear Management and Resources Council

NUMARC commented that the NRC's analysis of radionuclide deposition from fallout over open bodies of water was an acceptable method of determining the potential impacts. The NRC analysis made use of the existing Fermi site analysis, and incorporated relevant environmental parameters from other sites to make site-specific determinations.

Concern: NONE
Commenter: Rasin

Comment: 063.013
Page: B2

Subtopic: Supportive statement
Org: Nuclear Management and Resources Council

NUMARC commented that the NRC's method of analysis for determining the potential impacts of radiological releases to groundwater from severe accidents is an acceptable approach.

Concern: POA.005
Commenter: Rasin

Comment: 063.014
Page: E2.3–2.4

Subtopic: SAMDAs
Org: Nuclear Management and Resources Council

NUMARC supported the NRC position that SAMDAs need not be considered in individual license renewal applications, but strongly recommended that the NRC refocus the discussion in the GEIS. Additional effort is needed to technically justify that mitigation measures can be evaluated generically. NUMARC believes that the NRC cannot rely on the 1980 Policy Statement as the support for its position regarding SAMDAs because the original purpose of the Statement is no longer germane. Instead, the GEIS should describe more comprehensively the data relating to and supporting the NRC judgment that severe accidents pose only a small risk, and that individual plant analysis of SAMDAs is neither necessary nor appropriate. Additionally, the SAMDA discussion should give consideration to the Limerick case in which the courts suggested that SAMDAs cannot be treated generically. This discussion should explain how the technical evaluation conducted was consistent with the guidance set out in the Limerick case.

Concern: ALT.035
Commenter: Rasin

Comment: 063.015
Page: E2.5

Subtopic: Air quality
Org: Nuclear Management and Resources Council

NUMARC commented that the GEIS did not consider the CAA Amendments of 1990, which mandate of a 10 million ton cap on SO_2 emissions and a 2 million ton per year reduction in NO_x in fossil fuel plants. The GEIS analyses should consider the economic and environmental impacts of the CAA.

Concern: NONE
Commenter: Rasin

Comment: 063.016
Page: E2.6

Subtopic: Supportive statement
Org: Nuclear Management and Resources Council

NUMARC commented that in general, the evaluations for the Category 1 and 2 issues support the associated generic conclusions.

Concern: SOE.001 **Comment:** 063.017 **Subtopic:** Transportation-categorization
Commenter: Rasin **Page:** E2.7–2.8 **Org:** Nuclear Management and Resources Council

NUMARC commented on review of the GEIS analysis regarding transportation. They believe that it is appropriate to change the transportation issue from Category 3 to Category 2. The GEIS evaluation is based upon Level of Service (LOS) conditions for existing roadways during a shift change. An LOS of A or B would indicate insignificant impacts, an LOS of C or D would indicate a noticeable impact, and a LOS of E or F would indicate a significant impact. NUMARC recommends making transportation Category 2, and using the LOS determinations for specific plants as the enveloping criteria. The conclusion could be bounded if existing roadways had an LOS of A, B, C, or D, whereas an LOS of E or F would require further analysis or mitigative actions.

Concern: SWQ.013 **Comment:** 063.018 **Subtopic:** Categorization of issues
Commenter: Rasin **Page:** E2.8 **Org:** Nuclear Management and Resources Council

NUMARC commented that the issue of Effects of Refurbishment on Surface Water Quality should be changed from Category 2 to Category 1. The reason for the Category 2 finding appears to be a concern that licensees will not implement best management practices (BMPs) for the control of runoff to nearby surface water. Past experience has shown, however, that licensees do take the appropriate measures necessary to protect the environment and that these measures are fully identified in existing EISs.

Concern: GRW.002 **Comment:** 063.019 **Subtopic:** Water use conflicts-categorization
Commenter: Rasin **Page:** E2.8 **Org:** Nuclear Management and Resources Council

NUMARC commented that the issue of Use of Groundwater for Cooling Tower Makeup should be changed from Category 2 to Category 1. The GEIS conclusion is solely based on data from Ranney wells at Grand Gulf. However, previous pump tests at Grand Gulf have concluded that the water table in the floodplain alluvial is the only affected area, and that no groundwater users will be impacted. Additionally, this issue was addressed by Grand Gulf in their FEIS, which concluded that there was no impact.

Concern: GIS.009 **Comment:** 063.020 **Subtopic:** Nuclear power plants covered by GEIS
Commenter: Rasin **Page:** E2.9 **Org:** Nuclear Management and Resources Council

NUMARC commented that Washington Public Power Supply System Plants 1 and 3, Grand Gulf 2, and Perry 2 should be included in the scope of the GEIS. Since the GEIS evaluates environmental issues associated with license renewal, it is reasonable to assume that the

environmental impacts at each of the presently excluded licensees would also be enveloped by the GEIS.

Docket Number: 064

Concern: NEP.005	**Comment:** 064.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Pollard	**Page:** 2, 3; 18	**Org:** Union of Concerned Scientists

A public interest group contends that 1) the GEIS avoids thorough or objective analysis of the economic, safety, and environmental consequences of continuing to operate aging nuclear power plants, 2) the public is barred from participating in the decisions on renewal of individual licenses, and 3) public confidence in the openness and accountability of the NRC is seriously eroded by the generic approach to the economic, safety, and environmental issues of license renewal. It also contends that plant-specific analyses should be required for all NEPA-related issues until experience with license renewal provides a basis for determining which, if any, issues can be resolved on a generic basis.

Concern: NGC.004	**Comment:** 064.002	**Subtopic:** State participation
Commenter: Pollard	**Page:** 4	**Org:** Union of Concerned Scientists

A public interest group contends that the NRC has not demonstrated in the GEIS the ability to predict accurately either the total electricity generation needed or the number of the nuclear plants needed. Also, it asserts that the recent decisions to close the Yankee Rowe and San Onofre Unit 1 plants support the UCS position that the NRC has no rational basis for the generic finding that the generating capacity of every nuclear plant will be needed at the end of its 40-year operating license.

Concern: ALT.033	**Comment:** 064.003	**Subtopic:** Analysis of alternatives
Commenter: Pollard	**Page:** 5–9	**Org:** Union of Concerned Scientists

A public interest group disputes the NRC's generic finding that the alternatives to license renewal offer no advantage. It points out that numerous government and independent studies suggest that:

1. There are no serious technological limitations to prevent the widespread development of renewable energy sources in the next 30 years.

2. Resource availability will not pose a significant constraint for most renewable energy sources.

3. Most renewable energy technologies should be commercially competitive with conventional energy sources within the timeframe established by the NRC. Admittedly, cost reductions and performance improvements are needed.

4. Analysis indicates that a combination of improved energy efficiency, renewable energy sources, and "clean" fossil-fuel sources could meet all U.S. energy needs in 40 years without relicensing nuclear power plants or constructing new ones. (The analysis in question is a study released by the commenter and other groups, *America's Energy Choices: Investing in a Strong Economy and a Clean Environment*, 1991. This study is incorporated in commenter's comments by reference.)

5. The comparative costs and benefits of renewable sources versus nuclear relicensing must be evaluated on a case-by-case basis, and environmental impacts should be considered.

Concern: LIR.008 **Comment:** 064.004 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Pollard **Page:** 9, 10 **Org:** Union of Concerned Scientists

A public interest group contends that the NRC's claim that generalizations can be made about the costs and risks of operating all existing plants for 60 years is groundless and at odds with the position the NRC has taken in the past. It claims that the differences in existing plants preclude the generic assessment of many issues, including 1) the probability of both design-basis accidents and severe accidents involving significant fuel melting, 2) the magnitude of radioactive releases during nomal operation and postulated accidents, and 3) the costs associated with O&M.

Concern: LIR.008 **Comment:** 064.005 **Subtopic:** Refurbishment cost
Commenter: Pollard **Page:** 10 **Org:** Union of Concerned Scientists

A public interest group contends that the NRC has no basis for even a plant-specific estimate, much less a generic estimate, of the cost of refurbishment necessary for license renewal. There is very little experience with plants that have operated for even half of their 40-year design life and no experience with plants that have operated for a period approaching 60 years. In addition, the license renewal regulations (56 FR 64943) contain no technical requirements for estimating the cost of license renewal for any plant.

Concern: POA.016 **Comment:** 064.006 **Subtopic:** Severe accidents
Commenter: Pollard **Page:** 11–13 **Org:** Union of Concerned Scientists

A public interest group contends that the NRC has no valid basis for the generic finding in the GEIS that there will not be an increase in the risk of accidents in aging plants. In support of its argument, the group contends that 1) the license renewal regulations in 10 CFR Part 54 do not provide adequate protection for public safety (as noted in its October 15, 1990 comments on 55 FR 29043, which are incorporated in the present comments by reference), 2) the license renewal regulations contain no technical requirements to support the GEIS claim that license renewal will be the least expensive alternative, and 3) the NRC research program on the effects of aging is still in its infancy.

Concern: POA.021	**Comment:** 064.007	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Pollard	**Page:** 13–14	**Org:** Union of Concerned Scientists

A public interest group disagrees with use of existing plant-specific probabilistic risk assessments (PRAs) to support a generic conclusion that the risk of accidents will not increase during the renewal period. These PRAs are not valid because they do not account for the effects of aging and they neglect the failure of passive components.

Concern: LIR.008	**Comment:** 064.008	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Pollard	**Page:** 15	**Org:** Union of Concerned Scientists

A public interest group states that until passive failures of fluid systems are considered, the NRC can not justify issuing a license renewal and reaching generic conclusions that passive failures will have no effect on accident probabilities in aging nuclear plants.

Concern: POA.011	**Comment:** 064.009	**Subtopic:** SAMDAs
Commenter: Pollard	**Page:** 15–16	**Org:** Union of Concerned Scientists

A public interest group contends that 1) the NRC seeks to exclude from the license renewal process the consideration of severe accidents and the potential for installing additional safety features to protect against such accidents; 2) no factual justification for this exclusion is given; and 3) this exclusion violates NEPA. It further argues that the SAMDA issue must be addressed on a plant-specific basis because it cannot be resolved on a generic basis.

Concern: GIS.012	**Comment:** 064.010	**Subtopic:** Cost-benefit analysis
Commenter: Pollard	**Page:** 16–17	**Org:** Union of Concerned Scientists

A public interest group contends that there is no valid basis for assuming that the rapid escalation of O&M costs (as presented in a 1988 DOE study cited by the UCS) will cease during the license renewal period.

Concern: SWM.009	**Comment:** 064.011	**Subtopic:** Spent fuel
Commenter: Pollard	**Page:** 18	**Org:** Union of Concerned Scientists

A public interest group disagrees with the NRC position that the environmental impact of onsite storage of spent fuel need not be evaluated. It contends that public participation is necessary on a plant-specific basis because each nuclear plant will become, in essence, a *de facto* permanent waste dump for spent fuel.

Concern: NRR.006 **Comment:** 065.001 **Subtopic:** Alternatives to license renewal
Commenter: Weeber **Page:** 1–2 **Org:** Individual

A private citizen, who is a member of several local planning agencies and action groups believes that nuclear power is not preferable over non-polluting energy sources. The NRC must include in the relicensing process economic and alternative energy issues.

Concern: NRR.005 **Comment:** 065.002 **Subtopic:** Input on specific sites
Commenter: Weeber **Page:** 1 **Org:** Individual

A private citizen notes that the GEIS fails to address emergency planning even though there may be significant updates that need to be made.

Concern: SWM.019 **Comment:** 065.003 **Subtopic:** Radioactive waste disposal
Commenter: Weeber **Page:** 1–2 **Org:** Individual

A private citizen believes that the NRC must allow for the nuclear waste issue to be a priority in the relicensing process since there are significant health issues surrounding existing dumps nationally. Currently in Michigan, for example, MICHRAD (waste generator) must store all nuclear waste onsite since it has been cut off from disposing of the waste at Barnwell, Beaty, and Hanford. The NRC must incorporate in economic analyses and relicensing all waste disposal costs from uranium mining, reprocessing, power plant construction and operation, and disposal costs (HLW, LLW, and BRC), as well as the costs of operating and closed LLW dumps.

Concern: SWM.047 **Comment:** 065.004 **Subtopic:** Transportation
Commenter: Weeber **Page:** 1 **Org:** Individual

A private citizen believes that the NRC must allow the issue of transportation to be addressed in relicensing hearings since shipments pose a significant health risk to the public which uses these same roads. Those individuals closest to the plants also have an increased risk of radiation exposure associated with improper packaging and with accidents involving vehicles and higher volumes of shipments.

Concern: NEP.005 **Comment:** 065.005 **Subtopic:** Public participation/site-specific EISs
Commenter: Weeber **Page:** 2 **Org:** Individual

A private citizen believes that the NRC must prepare a separate EIS for each nuclear power plant before granting a license renewal since each nuclear reactor has a different life span, operation level, and potential hazardous impact on aquatic life, drinking water, and the environmental quality of the facility.

(Two copies of the second page of what appears to be a letter from commenter to the Chairperson of the House Energy Committee are included as part of the paperwork for this comment. These were not included in the Docket 065 analysis of comments.)

Docket Number: 066

Concern: NEP.005	**Comment:** 066.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Ferner	**Page:** 1	**Org:** Councilman, City of Toledo

A city councilman is opposed to any attempt by the NRC to simplify the license renewal process for nuclear power plants by resolving all important environmental issues and thus cutting the public out of the process before any plant applies for relicensing. Full public participation is the best way to ensure that problems are identified before they turn into tragedies. The NRC should prepare a separate EIS for each plant rather than a GEIS which covers virtually every relevant safety and environmental issue. Anything less jeopardizes the health and safety of people in the local and surrounding area.

Docket Number: 067

Concern: NRR.002	**Comment:** 067.001	**Subtopic:** GEIS approach
Commenter: Glassman	**Page:** 1	**Org:** Individual

A private citizen opposes generic environmental statements for license renewal because this means citizen participation would be cut and many safety, health, waste, and cost-efficient issues could not be raised. Since license renewal is for 20 years, the public would be shut out for that time and issues not dealt with. Let the public be informed and continue to voice their concerns.

Concern: NRR.002	**Comment:** 067.002	**Subtopic:** GEIS approach
Commenter: Glassman	**Page:** 1	**Org:** Individual

A private citizen believes that the NRC should support Federal standards as a minimum and more stringent protection standards by those States choosing to do so, i.e., allow States to set stricter standards than the NRC.

Docket Number: 068

Concern: NRR.002	**Comment:** 068.001	**Subtopic:** GEIS approach
Commenter: Raskin	**Page:** 1	**Org:** Individual

A private citizen opposes generic environmental statements for license renewal because this means

citizen participation would be cut and many safety, health, waste, and cost-efficient issues could not be raised. Since license renewal is for 20 years, the public would be shut out for that time and issues not dealt with. Let the public be informed and continue to voice their concerns.

Concern: NRR.002 **Comment:** 068.002 **Subtopic:** GEIS approach
Commenter: Raskin **Page:** 1 **Org:** Individual

A private citizen believes that the NRC should support Federal standards as a minimum and more stringent protection standards by those States choosing to do so, i.e., allow States to set stricter standards than the NRC.

Docket Number: 069

Concern: POA.013 **Comment:** 069.001 **Subtopic:** Plant aging
Commenter: Skorapa, Jr. **Page:** 1 **Org:** Individual

A private citizen believes that the potential environmental ramifications from a nuclear power plant malfunction are great since the potential for malfunction of any complex mechanical system increases with the wear and tear of time. As nuclear power plants age, they do not become more uniform, rather site-specific differences are magnified with time.

Concern: NRR.006 **Comment:** 069.002 **Subtopic:** Alternatives to license renewal
Commenter: Skorapa Jr. **Page:** 1 **Org:** Individual

A private citizen believes that it is not a foregone conclusion that relicensing of nuclear power plants is the most advantageous method of providing electric power.

Concern: NRR.001 **Comment:** 069.003 **Subtopic:** Waste disposal
Commenter: Skorapa Jr. **Page:** 1 **Org:** Individual

A private citizen noted that the problem of definitive disposition of radioactive waste remains unsolved.

Concern: NEP.005 **Comment:** 069.004 **Subtopic:** Public participation/site-specific EISs
Commenter: Skorapa Jr. **Page:** 1 **Org:** Individual

A private citizen believes that relicensing of any nuclear power facility should be considered on an individual basis requiring individual EIAs with opportunity for public involvement. The development of an EIS is not a perfunctory exercise incident to the licensing process, rather it is intended to ensure that significant environmental issues that pertain to a major enterprise are duly considered.

Docket Number: 070

Concern: NEP.005	**Comment:** 070.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Matthews	**Page:** 1	**Org:** Individual

A private citizen is shocked that the NRC would attempt to cut public involvement out of the relicensing process. The public needs to be actively involved since they are greatly concerned about safety and health issues. He is also shocked that the NRC would attempt to classify the majority of environmental risks from nuclear power as generic. It is essential that an EA be completed for each individual plant because the risks are site-specific. Since the nuclear industry does not have a good record on health and safety, waste management, or the release of nuclear material, there is no justification for easing controls.

Docket Number: 071

Concern: NONE	**Comment:** 071.001	**Subtopic:** References Docket 63
Commenter: Conway	**Page:** 1	**Org:** Arizona Public Service Company

An electric utility company endorses the comments provided by NUMARC (Docket 063).

Concern: GIS.008	**Comment:** 071.002	**Subtopic:** Corrections
Commenter: Conway	**Page:** 1	**Org:** Arizona Public Service Company

An electric utility company notes that Section 4.3.4.1.1, Ambient Salts, and Cooling-Tower Drift, page 4-28 of the GEIS indicates that "source water for cooling at Palo Verde had 10,000 to 26,000 ppm total dissolved solids" because "most of the water is treated sewage effluent and irrigation waste." In fact, the makeup water "source" is the onsite reservoir containing treated sewage effluent water that has received further onsite processing and includes no irrigation return water constituent. The reference cited, the NUS annual report on the deposition monitoring program for 1989, presents the annual mean concentration of total dissolved solids in that makeup water as 948 ppm. The concentrations mentioned in the GEIS are those of the circulating cooling water and represent the concentration achieved after evaporation of the makeup water in the cooling tower circuit.

Concern: GIS.008	**Comment:** 071.003	**Subtopic:** Corrections
Commenter: Conway	**Page:** 2	**Org:** Arizona Public Service Company

An electric utility company notes that Section 4.3.4.1.2 of the GEIS asserts that continuing cooling tower drift in the range of "25 to 50 kg/ha/year" may "significantly increase soil salinity and thus affect native and agricultural plants." Thus, Sections 4.3.4.3 and 4.3.5.1.2 suggest the need for "ongoing monitoring at Palo Verde." The salt drift monitoring program at Palo Verde has included analyses of drift deposition, soil, and native and cultivated vegetation since 1984. No

consistent pattern of changes in these sampled media from the background period has been observed since the inception of the program. In particular, the utility's annual reports have indicated that there have been no consistent or statistically significant correlations observed between drift deposition and changes in soil sodium, salinity, or the health of onsite native vegetation communities. Based upon the results of prior monitoring activities and the satisfaction of operating license requirements, on January 1, 1992, the salt monitoring program required by the NRC for Palo Verde was discontinued.

Concern: GIS.008 **Comment:** 071.004 **Subtopic:** Corrections
Commenter: Conway **Page:** 2 **Org:** Arizona Public Service Company

An electric utility company notes that in the GEIS, Appendix A, page A-47, the summary descriptions of the Palo Verde Cooling Water System should be corrected to read:

"Type: mechanical draft cooling towers
Source: Phoenix city sewage treatment plant effluent".

Docket Number: 072

Concern: NEP.005 **Comment:** 072.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Segal **Page:** 1 **Org:** Individual

A private citizen is opposed to the GEIS because it will exclude the public from participating in the license renewal process. Moreover, the NRC should support the more stringent protection standards of those States who choose to do so.

Docket Number: 073

Concern: NRR.002 **Comment:** 073.001 **Subtopic:** GEIS approach
Commenter: Heintraub **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 074

Concern: NEP.005	**Comment:** 074.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Segal	**Page:** 1	**Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 075

Concern: GIS.010	**Comment:** 075.001	**Subtopic:** Rulemaking & GEIS approach/ Analysis-approach, assumptions, and data
Commenter: Sprenger	**Page:** 1	**Org:** Public Service Commission of Wisconsin

A State agency claims that 1) the proposed limits in the GEIS and the *Federal Register* notice are narrow and do not provide either analysis of possible ranges of variation or scenario analyses; and 2) with respect to the need, alternatives, and EMF analyses, the bounds are severely flawed. It has major comments on the level of review needed on the issues of need, alternatives, and EMF, as well as the amounts of spent fuel. It claims that a Category 3 designation is appropriate for the issues of need, alternatives, and EMF. (See Comments 075.002, 075.003, 075.004, 075.005.)

Concern: NONE	**Comment:** 075.002	**Subtopic:** References Docket 79
Commenter: Sprenger	**Page:** 1	**Org:** Public Service Commission of Wisconsin

A State agency notes its agreement with many of the conclusions of the Tellus Institute Study done for the Vermont Department of Public Service in support of its comments on the GEIS and proposed rule.

Concern: NGC.004	**Comment:** 075.003	**Subtopic:** State participation
Commenter: Sprenger	**Page:** 1, 2	**Org:** Public Service Commission of Wisconsin

A State agency claims that 1) the review of need is the responsibility of the utilities and the State utility regulation agency; and 2) the review of need in the GEIS is not adequate for the future 20-year reviews performed every 2 to 3 years in Wisconsin. Also, the GEIS review covers broad regions rather than States.

Concern: ALT.011 **Comment:** 075.004 **Subtopic:** Comparison of alternatives
Commenter: Sprenger **Page:** 3 **Org:** Public Service Commission of Wisconsin

A State agency identified three major flaws in the GEIS analysis of alternatives: 1) the range of fossil technologies was limited to conventional coal and did not include newer coal technologies or gas-fired power plants, 2) the analysis used low values for potential renewable contributions and assumed no evolution of the technology or reduction in the costs of renewable energy, and 3) the analysis assessed the capability of each alternative, by itself, to supply capacity equal to that of presently operating nuclear units. The analysis should have 1) evaluated the capability of a mix of options, 2) included technologies that will become commercially available, and 3) assumed future improvements in technology and changes in capital and operating costs.

Concern: ALT.033 **Comment:** 075.004a **Subtopic:** Analysis of alternatives
Commenter: Sprenger **Page:** 3 **Org:** Public Service Commission of Wisconsin

A State agency also claims that the potential contributions of demand side and renewables are substantially less than expected by the staff of the Public Service Commission of Wisconsin or those shown in a pre-publication manuscript version of the National Academy of Science "Policy Implications of Greenhouse Warning," Mitigation Panel, and in tables of the published report of the Synthesis Panel with the same title.

Concern: HHI.010 **Comment:** 075.005 **Subtopic:** Electromagnetic fields impacts
Commenter: Sprenger **Page:** 3 **Org:** Public Service Commission of Wisconsin

A State agency notes that the GEIS did not examine any studies of the occupational effects of exposure to EMF or make any reference to the "Peters Study," (*American Journal of Epidemiology*, 134: 923–937, "Exposure to Residential Electric and Magnetic Fields and Risk of Childhood Leukemia" by London et al.) Given the uncertainty regarding the outcome of ongoing research and of likely future legal requirements, the agency believes that this issue will require future examination and that review in each relicensing application will be required.

Concern: SWM.011 **Comment:** 075.006 **Subtopic:** Spent fuel
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

A State agency claims that the volume of spent fuel accumulated by the year 2020 (if licenses are extended for all presently operating nuclear power plants) will substantially exceed the capacity of the first HLW repository site. If a second HLW repository site has to be located and licensed, the citizens of Wisconsin will be very concerned about the possibility that it will be located in Wisconsin.

Concern: AQE.014 **Comment:** 075.007 **Subtopic:** Entrainment/impingement
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

Page 2-13, lines 3–4

There is no mention in the GEIS of possible need to change the design of the water intake structure to one causing less impingement than the original design or to a design that reduces problems from zebra mussels.

Concern: AQE.015 **Comment:** 075.008 **Subtopic:** Chemical effects
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

Page 2-20, lines 3–4

There should not be emission of phosphate from Wisconsin nuclear power plants because phosphate detergents are banned in Wisconsin.

Concern: SWM.014 **Comment:** 075.009 **Subtopic:** Mixed waste
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

Page 2-22, lines 38–39

A State agency asked how much asbestos removal will be needed for refurbishment, and if any of it will likely be contaminated with radionuclides.

Concern: LIR.009 **Comment:** 075.010 **Subtopic:** Refurbishment cost
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

Page 2-31, line 37

A State agency asked about the life expectancy of replacement steam generators, and whether steam generator replacement for Kewaunee and Point Beach plants would still be part of plant refurbishment/replacement activities during the license renewal period.

Concern: LIR.004 **Comment:** 075.011 **Subtopic:** Refurbishment cost
Commenter: Sprenger **Page:** 4 **Org:** Public Service Commission of Wisconsin

Page 2-32, lines 31–33

A State agency referred to the statement in the GEIS that, ". . . increased outage time derives from the expanded scope of ISTM activities . . . ." It noted that for units with high capacity factors now, increased outage duration due to increased ISTM activities will increase the cost of power. Commenter also cited projections for capacity factors for Point Beach and Kewaunee plants.

Concern: TEL.008 **Comment:** 075.012 **Subtopic:** Transmission lines
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 3-4, lines 27–28

The transmission lines connected to Point Beach and Kewaunee are on wooden H-frames. Most transmission lines on wooden poles need rebuilding when the poles have been in use for 50–60 years.

Concern: SOE.008 **Comment:** 075.013 **Subtopic:** Taxes
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 3-12, lines 2–7, 28–32

The tax discussion does not apply to Wisconsin. Tax payments to the State are based on utility revenue. Shared tax payments to the municipality and county are based on a portion of the book value of the power plant, unless limited by population size.

Concern: SOE.009 **Comment:** 075.014 **Subtopic:** Land use
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin.

Page 4-53, lines 30–33

While several land uses are not restricted by ROW, other problems may occur. ROW that crosses nonagricultural land is often an invitation to trespass by hunters, etc.

Concern: SOE.009 **Comment:** 075.015 **Subtopic:** Land use
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 4-53, lines 26–28, 34

Wisconsin doubts that many farmers would agree that compensation for ROW easements, paid in 1970, is adequate compensation for economic losses caused by farming around the base of H-frames (for power lines).

Concern: SOE.009 **Comment:** 075.016 **Subtopic:** Land use
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 4-54, lines 17–18

H-frames not only increase the time to perform plowing, planting, insect and weed control, etc., they also cause equipment damage when equipment bumps the structure. This can be significant for crops where timely action is needed to avoid yield or quality reductions.

Concern: SWM.001 **Comment:** 075.017 **Subtopic:** LLW storage/disposal
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 6-16

The Supreme Court decision on the challenge of the constitutionality of putting responsibility for LLW on the States may affect much of the discussion about storage and disposal.

Concern: SWM.005 **Comment:** 075.018 **Subtopic:** LLW disposal
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 6-18, lines 10–11; page 6-22, Table; page 6-23, line 5

Michigan is no longer part of the Midwest Compact. D. C. Cook plant is no longer with the Compact. The number of plants in Table 6.9 should be checked.

Concern: DEC.008 **Comment:** 075.019 **Subtopic:** Taxes
Commenter: Sprenger **Page:** 5 **Org:** Public Service Commission of Wisconsin

Page 9-4, line 17

If taxes are based on the book value of the power plant, taxes near the end of life should be small and the effect of decommissioning on tax payments should be small.

Concern: ALT.018 **Comment:** 075.020 **Subtopic:** Coal impacts
Commenter: Sprenger **Page:** 6 **Org:** Public Service Commission of Wisconsin

Pages 9-28 to 9-31

The magnitude of differences in emissions for the three fossil fuels is not at all clear in Table 9.1. Furthemore, saleability of ash is not discussed. For example, bottom ash from Wisconsin power plants is sold for use as grit on roof shingles, fly ash from western coal is sold for use in cement, and both forms of ash may be used as soil amendments. Wisconsin utilities now sell 35–85 percent of the ash generated at coal-fired power plants.

Concern: ALT.034 **Comment:** 075.021 **Subtopic:** Economic analysis
Commenter: Sprenger **Page:** 6 **Org:** Public Service Commission of Wisconsin

GEIS Vol. 1, Chapter 9; Vol. 2, Section H

EPRI Technical Assessment Guide (EPRI P-6587-L, Vol. 1: Rev. 6, Sept. 1990) has recent cost estimates for several technologies. Costs for fossil fuel power plants should include the cost of SO_2 allowances in the operating costs. Future legislation regarding global warming may also require purchase of offsets for CO_2 emissions.

Docket Number: 076

Concern: NONE **Comment:** 076.001 **Subtopic:** References Docket 63
Commenter: McCoy **Page:** 1 **Org:** Georgia Power Company

An electric utility company agrees totally with the NUMARC comments that are to be provided to the NRC.

Docket Number: 077

Concern: NONE **Comment:** 077.001 **Subtopic:** References Docket 63
Commenter: Opeka **Page:** 1 **Org:** Northeast Utilities

Two electric utility companies (Northeast Nuclear Energy Company and Connecticut Yankee Atomic Power Company, operating as Northeast Utilities) endorsed the NUMARC comments submitted to the NRC.

Docket Number: 078

Concern: GIS.009 **Comment:** 078.001 **Subtopic:** Nuclear power plants covered by GEIS
Commenter: Silberg **Page:** 1 **Org:** Shaw, Pittman, Potts & Trowbridge

Legal counsel for an electric utility (Cleveland Electric Illuminating Co.) disagrees with the exclusion of Perry Unit 2 from the scope of the proposed rule and requests that Perry Unit 2 be included within the scope of the proposed Part 51 rulemaking.

Concern: NONE **Comment:** 078.001a **Subtopic:** References Docket 63
Commenter: Silberg **Page:** 1 **Org:** Shaw, Pittman, Potts & Trowbridge

Legal counsel for an electric utility company indicated that the utility supports the comments filed by NUMARC.

Docket Number: 079

Concern: GIS.011 **Comment:** 079.001 **Subtopic:** Rulemaking & GEIS approach
Commenter: Sedano **Page:** 2 **Org:** State of Vermont

A State agency indicated that its Nuclear Advisory Panel is strongly opposed to the GEIS for license renewal and offered the following resolution:

"The [Vermont State Nuclear Advisory] Panel encourages the Department to pursue and to complete a strong statement of exceptions and opposition to the GEIS. And furthermore, the Panel expresses its concern that the GEIS, in combination with the standardized plant and combined construction/operating license features of the license reform proposal, represents a trend toward increased centralized control over the commercial nuclear power plant licensing process that significantly impedes the participation of citizens and the States in the process."

Concern: NRR.007 **Comment:** 079.002 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** A1 **Org:** State of Vermont

A State agency indicated that their review of the GEIS and the issues addressed therein concluded that the following issues should be categorized differently than stated in Table B-1:

Issue	Table B-1	Vermont Eval.
Need for Generating Capacity via License Renewal	Category 1	Category 3
Advantage of Alternatives to License Renewal	Category 1	Category 3
Refurbishment Costs	Category 1	Category 3
Fuel Costs	Category 1	Category 3
Operation and Maintenance Costs	Category 1	Category 3
EMF, Chronic Effects	Category 1	Category 3
Radiation Exposure to the Public (Operation)	Category 1	Category 3
Radiological and Non-radiological Impacts (Uranium Fuel Cycle)	Category 1	Category 3
Low-Level Radioactive Waste Disposal	Category 2	Category 2 (with elaboration)
Mixed Waste	Category 1	Category 2
Spent Fuel	Category 1	Category 3

(The basis for specific conclusions are provided in the subsequent comments from Docket 079.)

Concern: SWM.001 **Comment:** 079.003 **Subtopic:** LLW storage/disposal
Commenter: Sedano **Page:** A2–A3 **Org:** State of Vermont

A State agency indicated that the environmental impacts of LLW disposal are not adequately addressed in 56 FR 47028 paragraph (I). The NEPA determination should not be considered complete until a nuclear plant can determine that it will have access to a LLW disposal facility. The commenter believes that it is not proper for the NRC to complete a NEPA evaluation as acceptable, and subsequently place an additional 20-year waste disposal burden upon States, to which the States may not agree. The commenter recommended the following change to 56 FR 47028(I): ". . . If no such demonstration can be made, certification must be presented from an appropriate jurisdiction or agency that such access will be available for the period of license renewal. In addition, a presentation of capability . . . ."

Concern: ALT.011 **Comment:** 079.004 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** A3–A4 **Org:** State of Vermont

A State agency indicated that the limitation of alternatives to only "a coal-fired plant" in 56 FR 47028 paragraph (J) disagrees with both the supplemental notes (at p. 47019— "The most reasonable replacement alternative") and the GEIS (at p. 9-41—which concludes, "These alternatives would include oil, gas, and new nuclear"). The commenter indicated that the variations of possible alternatives and the uncertainties of economics regarding alternatives render it impossible to reach a generic conclusion for any plant. Specifically, the Vermont electrical generation system is such that the Vermont Yankee nuclear plant does not fit within the generic envelope postulated by the GEIS, and alternatives to the renewal of its license must be evaluated on a site-specific basis.

Concern: NEP.006 **Comment:** 079.005 **Subtopic:** Periodic assessments
Commenter: Sedano **Page:** A4–A5 **Org:** State of Vermont

A State agency recommended that the proposed rule be modified to further clarify the required contents of the supplemental report during the *Operating license renewal stage*. Specifically, the commenter recommended that proposed 10 CFR 51.53(c)(4) 56 FR 47028 include the following wording which appears in the existing *Postoperating license stage* 10 CFR 51.53(d) 56 FR 47028:

> [The Supplement should] reflect any new information or significant environmental change associated with the applicant's proposed [license renewal] activities.

The commenter suggested that additional guidance should be included on interpreting the term "significant environmental change." The commenter indicated that the notes to the proposed rule at 56 FR 47019 specify that a petition to amend 10 CFR Part 51 will be acted upon if new information warrants reopening of the issues. The commenter believes that this requirement is contrary to the purpose of efficiency stated as a reason for the rule at 56 FR 47017. Since it is reasonable to expect that there will be changes to the GEIS conclusions over such a long period of time, the requirement of rule amendment is a great burden on the party wishing to put forward the information. Rather, the above precedent established in the existing rule should be carried over to license renewal—that any new or significant information be required for the plant-specific environmental review. The suggested changes would also be reflected in 56 FR 47029 proposed 10 CFR 51.95(c), which implements portions of proposed 51.53(c).

Concern: NONE **Comment:** 079.006 **Subtopic:** Periodic assessments
Commenter: Sedano **Page:** A5 **Org:** State of Vermont

(This comment is incorporated into Comment 079.005.)

Concern: NEP.006 **Comment:** 079.007 **Subtopic:** Periodic assessments
Commenter: Sedano **Page:** A5–A6 **Org:** State of Vermont

A State agency expressed concern over 56 FR 47029—Appendix B to Subpart A, where the NRC

specified the need for periodic reviews of the material in the appendix. The commenter believes that conditions twenty or more years in the future are so uncertain that the value of the generic rulemaking is questionable. Rather than committing to periodic updates, the agency recommends that the NRC give consideration to returning to the plant-specific method for the NEPA determination. However, if the generic approach is to be pursued, the periodicity of review and update should be stated in the rule. The commenter believes that the economics of the GEIS are dated even now, and therefore, the periodicity of the review should be no greater than two years.

Concern: LIR.008 **Comment:** 079.008 **Subtopic:** Refurbishment cost
Commenter: Sedano **Page:** A6 **Org:** State of Vermont

The 8-year duration and 9-month major outage assumptions in Section 2.4.1 are used as a basis for development of costs and for determination of specific plant application scheduling setbacks. These assumptions do not have firm and sufficient basis and yet have a significant impact on the evaluation. Some plants may require more refurbishment work, others less. These assumptions, for both cost and schedule, should be plant-specific assumptions based on the plant-specific applications in accordance with 10 CFR Part 54.

Concern: SWM.007 **Comment:** 079.009 **Subtopic:** LLW disposal-cost/volume
Commenter: Sedano **Page:** A7 **Org:** State of Vermont

Table 2.7, which is repeated as Table B.6 (see also Table 6.5) does not envelope expected LLW volume or costs for Vermont Yankee. At present rates, Vermont Yankee generates approximately 6,000 ft^3 of LLW per year. This would result in 120,000 ft^3 in 20 years of operation with a renewed license. Assuming other volumes in the table are correct, this would result in 154,000 ft^3 of wastes instead of 62,000 ft^3 of wastes. Using a disposal cost of $300 per ft^3, the disposal costs alone would exceed $46 million. It is not clear whether this cost is accounted for or whether Vermont Yankee fits within the assumed envelope.

In the past 5 years, Vermont Yankee has employed waste volume techniques to reduce its volume significantly. It is not clear that an assumed additional reduction of 10 percent (p. B-29) is valid for Vermont Yankee. This fact is corroborated by GEIS Tables 6.4 and 6.7.

Concern: HHI.048 **Comment:** 079.010 **Subtopic:** Radiation exposure-public/worker
Commenter: Sedano **Page:** A7 **Org:** State of Vermont

Following post TMI modifications in the early 1980s, occupational dose has been decreasing and the GEIS implies that the trend will continue downward or remain at low levels. It is likely that currently unexpected circumstances will change exposure assumptions during the future 20-year period in question. It would be helpful if the NRC addressed at least the following postulated situations:

1. New, extensive backfitting requirements caused by "lessons learned" from a future TMI-like accident.

2. Lowering of the Maximum Permissible Dose (MPD). The last significant change of the MPD about thirty years ago was done because it was feasible within the context of actual exposure—consistent with as low as is reasonably achievable (ALARA)—and not because of any specific radiobiology infomation. A similar reduction in the next 20 years is probable.

Concern: HHI.010 **Comment:** 079.011 **Subtopic:** Electromagnetic fields impacts
Commenter: Sedano **Page:** A8 **Org:** State of Vermont

Effects on humans from exposure to EMFs from transmission lines are still not completely understood. Consequently, few regulatory requirements exist. Requirements from transmission lines from nuclear plants should be identical to requirements placed on transmission lines from any type of generator facility. This issue should be classified as Category 3.

Concern: HHI.029 **Comment:** 079.012 **Subtopic:** Radiation exposure-public/worker
Commenter: Sedano **Page:** A8 **Org:** State of Vermont

Section 4.6 on Radiological Impacts of Normal Operation does not adequately accommodate for the results of BEIR V or other recent studies (see *Vermont Alternatives to Nuclear Plant License Renewal*) to arrive at a generic conclusion for plant decisions twenty years or more in the future. The results of these studies indicate a high probability that acceptable radiation standards will be lowered and that the health effects are greater than considered in present standards. Therefore, this issue should be classified as Category 3.

Concern: HHI.017 **Comment:** 079.013 **Subtopic:** Health effects of alternative fuels
Commenter: Sedano **Page:** A9 **Org:** State of Vermont

The radiological evaluations from Sections 4.6, 4.8, 6.3 and 6.5, are performed in a manner which specifically obscures the central issue of a NEPA evaluation, which is an environmental preferability determination between the radiological impacts of nuclear plants and the environmental impacts of alternatives. Each of the GEIS sections identified above uses established NRC mechanisms to declare various radiological impacts as insignificant. This fractioning avoids the conclusion that license renewal radioactivity would result in real health impacts and real irretrievable resource commitments which may clearly be less preferable than license renewal alternatives. Because the radiological impacts in these sections are only valid in comparison with alternatives, and because alternatives are plant-specific, the radiological conclusions of these sections must be determined as Category 3, and must be reserved for specific plant applications.

Concern: TEL.012 **Comment:** 079.014 **Subtopic:** Offsite land use
Commenter: Sedano **Page:** A9–A10 **Org:** State of Vermont

A State agency commented that Section 4.8.1 of the GEIS regarding the common classes of land use does not adequately consider the permanent commitment of land for radioactive waste disposal as compared with other options. The permanence of land committed for radioactive disposal

deserves a separate categorization, different from other "permanent land uses" (which can eventually be reclaimed with effort or after an amount of time). This separate characterization would make it clear that a small amount of land used for radioactive waste disposal may be significantly less preferable than a larger amount of land disturbed by local strip mining, which can be reclaimed if desired. In addition, while the Table S-3 evaluation and the GEIS attempt to compare nuclear plant land uses with coal plant land uses, different alternatives exist for which the adverse land use effect of radioactive waste disposal is much more pronounced than for the coal cycle. The commenter indicated that by attempting to use Table S-3 conclusions, the GEIS evaluation significantly obscures the land use environmental impact and cannot be considered adequate.

Concern: SWM.008 **Comment:** 079.015 **Subtopic:** Spent fuel and LLW
Commenter: Sedano **Page:** A10–A12 **Org:** State of Vermont

A State agency commented that Table S-3 is not an adequate basis on which to evaluate that there will be no significant radioactive releases to the environment from the LLW generated as a result of license renewal (GEIS Section 4.8.6). The disposal of LLW required by the Low-Level Radioactive Waste Policy Act (LLRWPA) as amended in 1985 is greatly different than that assumed for Table S-3. Table S-3 assumes disposal by shallow land burial at six established sites, three of which have since been closed due to leakage of radioactivity into the environment. The commenter indicated that it may not even be possible to site a facility in the State of Vermont that meets the assumptions of Table S-3. Therefore, the limitations of Table S-3, along with our changing understanding of the effects of radioactivity, dictate that environmental conclusions for radiological consequences cannot be made at this time and must be reserved for the plant-specific applications.

Concern: SWM.021 **Comment:** 079.016 **Subtopic:** Uranium fuel cycle
Commenter: Sedano **Page:** A12 **Org:** State of Vermont

A State agency took exception to the NRC finding in Section 4.8.9 that the uranium fuel cycle could be evaluated as Category 1 because the land use and radiological impacts of the fuel cycle have yet to be resolved. The commenter believes that (1) spent fuel issues cannot be resolved until covered by public law, and a disposal site is in place (Category 3); (2) land use issues must be compared with specific alternatives (Category 3); and (3) radiological consequences of LLW are dependent on the availability of access to disposal sites (Category 2). Consequently, the uranium fuel cycle issue should be Category 3.

Concern: SWM.033 **Comment:** 079.017 **Subtopic:** LLW storage/disposal
Commenter: Sedano **Page:** A13 **Org:** State of Vermont

The GEIS statement from Section 6.3.3.3, page 6-25 that "all LLW compacts and declared unaffiliated States are planning to accommodate anticipated waste streams from license-renewal-associated refurbishment and an additional 20 years of normal operations (Table 6.8)" is not true for Vermont.

The GEIS and proposed rule must deal with the problem of an environmental determination when there is no commitment for disposal access. At a minimum, the following must be considered:

1. The likelihood that a disposal facility will be available.

2. The propriety of reliance on the LLRWPA (see p. 6-22) to impose an additional 20-year disposal burden on States.

The insertion of the following statement in page 6-26, which is currently not reflected in the proposed rule, may be the best way to address this issue: "Alternatively, the consummation of an agreement with a respective compact or unaffiliated State for interim storage could suffice."

Concern: SWM.014 **Comment:** 079.018 **Subtopic:** Mixed waste
Commenter: Sedano **Page:** A13–A14 **Org:** State of Vermont

The proposed rule and GEIS treatment of mixed waste suffers from the same problem as LLW. The siting of disposal facilities for mixed waste is even lagging behind LLW disposal facilities. The specific plant application should be required to demonstrate that a mixed waste disposal facility is available, or as an alternative, certification should be provided from an appropriate agency verifying that a mixed waste disposal facility will be available for the period of license renewal. This issue should be classified as Category 2.

Concern: NGC.004 **Comment:** 079.019 **Subtopic:** State participation
Commenter: Sedano **Page:** A14 **Org:** State of Vermont

Need for power should not be excluded for consideration for each plant. Rather, it should be designated as Category 3 because:

1. The need for power determination shown in the GEIS is not complex or burdensome.

2. A conclusion based on uncertain assumptions so far in advance of specific applications is not necessary or desirable.

Even if the NRC does not accept Vermont's comment that need-for-power should be designated Category 3, the need for power issue for Vermont Yankee has not been shown to be within the generic envelope for the reasons stated in *Vermont Alternatives to Nuclear Power Plant License Renewal.*

Concern: SWM.011 **Comment:** 079.020 **Subtopic:** Spent fuel
Commenter: Sedano **Page:** A15 **Org:** State of Vermont

Section 6.5 of the GEIS (Section on Spent Fuel) evaluates the impacts of temporary storage of spent fuel instead of permanent storage. For permanent storage, it is stated that a second HLW repository would be required (GEIS p. 6-35). The radiological and land use issues surrounding this second repository, which the central issues, are not evaluated clearly in the GEIS.

The effects of the creation of 50 percent more spent fuel is evaluated incorrectly as a Category 1 issue (GEIS p. 6-36). While the spent fuel issue is properly generic, rather than plant-specific, the issue cannot be considered resolved until a disposal location is selected and evaluated (and included within the scope of public laws). Lacking this, environmental impacts of spent fuel must be considered Category 3, not resolved for any plant.

Concern: ALT.021 **Comment:** 079.021a **Subtopic:** Imported power
Commenter: Sedano **Page:** A16 **Org:** State of Vermont

Section 9.3, page 9-5, of the GEIS describes alternative energy resources and their potential to replace generating capacity that would be lost by not renewing a license. Importation of foreign generation capacity should be considered as an alternative.

Concern: ALT.030 **Comment:** 079.021b **Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sedano **Page:** A16 **Org:** State of Vermont

Section 9.3, page 9-5, of the GEIS describes alternative energy resources and their potential to replace generating capacity that would be lost by not renewing a license. Nonutility generation (nonbaseload sources) should specifically be discussed among the alternatives.

Concern: ALT.016 **Comment:** 079.021c **Subtopic:** Demand side management
Commenter: Sedano **Page:** A16 **Org:** State of Vermont

Section 9.3, page 9-5, of the GEIS describes alternative energy resources and their potential to replace generating capacity that would be lost by not renewing a license. DSM should be considered as an alternative to license renewal; the DSM forecasts given in the GEIS are pessimistic.

Concern: ALT.024 **Comment:** 079.022 **Subtopic:** Pumped hydro
Commenter: Sedano **Page:** A17 **Org:** State of Vermont

Hydropower forms a portion of the capacity that will likely be developed to meet future need in Vermont. Hydropower must be considered in conjunction with other viable alternatives and, therefore, cannot be dismissed based on "limited availability and other constraints."

Concern: ALT.017 **Comment:** 079.023 **Subtopic:** Biomass energy/Categorization
Commenter: Sedano **Page:** A17 **Org:** State of Vermont

Renewable generation from wood forms a portion of the capacity that will likely be developed to meet future need in Vermont. It appears that wood gasification technology may prove to be environmentally preferable to nuclear license renewal. No data are provided in the GEIS to compare nuclear versus wood gasification environmental impacts. Also, costs have been so

variable, especially nuclear costs, that elimination of biomass on economic grounds cannot be reasonably concluded at this time.

Concern: ALT.021 **Comment:** 079.024 **Subtopic:** Imported power
Commenter: Sedano **Page:** A18 **Org:** State of Vermont

Table 9.1 must be expanded to include evaluation of generic impacts from purchased power from Canada, and aggregates of smaller renewable and nonutility generation sources.

Concern: ALT.021 **Comment:** 079.025 **Subtopic:** Imported power
Commenter: Sedano **Page:** A18 **Org:** State of Vermont

Health impacts identified in Section 9.4.3.4 must be provided for oil, gas, importation from Canada, and aggregates of smaller renewable and nonutility generation sources. If this data cannot be provided, health impacts of alternatives may not be considered resolved generically, but must be considered on a plant/alternative-specific basis. Health impacts of the nuclear option are likely understated, whereas the health impacts from imported Canadian power appear to be small or nil.

Concern: ALT.022 **Comment:** 079.026 **Subtopic:** Natural gas
Commenter: Sedano **Page:** A19 **Org:** State of Vermont

Natural gas prices tend to follow oil prices in the long run. Oil price forecasting has not been accomplished with the degree of accuracy to allow the conclusion stated in Section 9.4.5.2 that gas will become increasingly less competitive to coal after the year 2000. Exclusion of natural gas from consideration as an alternative so far in advance of specific plant application, based on uncertain economic forecasts, is undesirable. The CAA may invalidate post-2000 assertions regarding natural gas.

Concern: ALT.001 **Comment:** 079.027 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** A19 **Org:** State of Vermont

For the reasons stated in comments 079.003 through 079.026, and in *Need for Alternatives to Nuclear Plant License Renewal* and *Vermont Alternatives to Nuclear Plant License Renewal*, the issue of alternatives must be considered Category 3.

Concern: ALT.021 **Comment:** 079.028a **Subtopic:** Imported power
Commenter: Sedano **Page:** A19 **Org:** State of Vermont

Section 9.5, page 9-41 concludes that only fossil fuel and nuclear power plants are the potential alternatives. If the GEIS is revised, importation of foreign electric generation should be included as a potential alternative.

Concern: ALT.033 **Comment:** 079.028b **Subtopic:** Analysis of alternatives
Commenter: Sedano **Page:** A20 **Org:** State of Vermont

Section 9.5, page 9-41 concludes that only fossil fuel and nuclear power plants are the potential alternatives. If the GEIS is revised, combinations of DSM, development of renewable generation, and nonutility generation should be included as potential alternatives.

Concern: ALT.022 **Comment:** 079.029a **Subtopic:** Natural gas
Commenter: Sedano **Page:** A20 **Org:** State of Vermont

The statement in Section 9.5, page 9-41 that "none of these [potential alternatives] can offer significant environmental advantages over license renewal" is the major result and conclusion of the NEPA review, achieved through a balancing of environmental costs of the proposed action and alternatives. This statement is flatly inaccurate and cannot be made for Vermont and Vermont Yankee. The statement is not supported by the evaluation presented heretofore, specifically for natural gas, and petroleum products.

Concern: ALT.033 **Comment:** 079.029b **Subtopic:** Analysis of alternatives
Commenter: Sedano **Page:** A20 **Org:** State of Vermont

The statement in Section 9.5, page 9-41 that "none of these [potential alternatives] can offer significant environmental advantages over license renewal" is the major result and conclusion of the NEPA review, achieved through a balancing of environmental costs of the proposed action and alternatives. This statement is flatly inaccurate and cannot be made for Vermont and Vermont Yankee. The statement is not true for viable Vermont alternatives of renewable energy.

Concern: ALT.021 **Comment:** 079.029c **Subtopic:** Imported power
Commenter: Sedano **Page:** A20 **Org:** State of Vermont

The statement in Section 9.5, page 9-41 that "none of these [potential alternatives] can offer significant environmental advantages over license renewal" is the major result and conclusion of the NEPA review, achieved through a balancing of environmental costs of the proposed action and alternatives. This statement is flatly inaccurate and cannot be made for Vermont and Vermont Yankee. The statement is not true for purchased power from Canada (see *Vermont Alternatives to Nuclear Plant License Renewal*).

Concern: TEL.012 **Comment:** 079.030 **Subtopic:** Offsite land use
Commenter: Sedano **Page:** A23 **Org:** State of Vermont

A State agency commented that the assessment of commitment of resources in Section 10.2 is inadequate for the purposes of NEPA. Since additional land will be required for HLW and LLW disposal, the section must (1) assess the likelihood that such resources are available, and (2) evaluate the aspect that such land (if available) will be removed from social usefulness

essentially forever. The commenter believes that the permanency of this impact must be considered to weigh heavily when compared to more short-term impacts.

Concern: GIS.012 **Comment:** 079.031 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** A24 **Org:** State of Vermont

A State agency takes exception to the GEIS conclusion in Section 10.6 that there will be accrued benefits that outweigh the costs of license renewal. For all the reasons specified in its comments on the GEIS, the agency believes that the NRC's conclusion is unwarranted and unsupported for all nuclear power plants in general, and for Vermont Yankee specifically. The agency believes that this determination must be reserved for specific plant applications.

Concern: NGC.004 **Comment:** 079.032 **Subtopic:** State participation
Commenter: Sedano **Page:** B04 **Org:** State of Vermont

Past electric system load growth forecasts have been unreliable. For example, the 1974 forecast of the 1981 peak demand in the U.S. was for about 650 GW, 220 GW higher than the actual 1981 peak.

Concern: NONE **Comment:** 079.033 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B04 **Org:** State of Vermont

The track record for oil price forecasting is also poor. Predictions of the 1990 world oil price have gone from about $30 per barrel in the late 1970s, to over $70 per barrel in the early 1980s back down to $30 per barrel. The actual average price for 1990 was below $20 per barrel. Actual and forecast prices for natural gas tend to follow oil prices. For example, between 1973 and 1984 while oil prices increased by $4.06 per MMBTU, natural gas prices increased by about $3.27 per MMBTU; and both decreased in 1985 (EIA 1992).

Concern: GIS.012 **Comment:** 079.034 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B04 **Org:** State of Vermont

Nuclear power construction and operating costs have been particularly prone to unfounded optimism. Since the original cost estimates for existing nuclear plants totaled $45 billion (1990 dollars), while actual construction costs amounted to $145 billion, the overrun should serve as a lesson for planners considering the economics of license renewal.

Concern: NGC.004 **Comment:** 079.035 **Subtopic:** State participation
Commenter: Biewald **Page:** B04 **Org:** State of Vermont

Planning analysis in determining the need for generating capacity should explicitly recognize key uncertainties, and resource plans should value flexibility and diversity. The commenter believes that the NRC's analysis fails to address uncertainty in its forecasting.

Concern: NGC.004 **Comment:** 079.036 **Subtopic:** State participation
Commenter: Sedano **Page:** B04 **Org:** State of Vermont

The conclusions that the NRC reaches on capacity need in the period 2010 to 2030 cannot be made with confidence. Energy planners have made tremendous errors in forecasting electric system load growth, fuel prices, nuclear plant construction and operating costs, and nuclear plant performance. Given these uncertainties, and the lead time requirement of about one decade, it is unnecessary and counterproductive to make determinations now regarding the need for and the economics of license renewal for nuclear plants.

Concern: NONE **Comment:** 079.037 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

Nuclear capacity existing in the U.S.—about 100 GW— represents 15 percent of total currently installed electric generating capacity.

Concern: NONE **Comment:** 079.038 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

Capacity that would be provided by the extension of nuclear generating unit licenses by 20 years would begin to be available in significant quantities around the year 2010, and would increase to about 100 GW by 2030, after which it would decline toward zero by 2050.

Concern: NONE **Comment:** 079.039 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

If future U.S. electric resource requirements grow at an average annual rate of 1.3 percent (as forecast in the GEIS), then the capacity available from nuclear license renewal will provide only one relatively modest component of the total generation figure required. For example, in its peak year, 2030, the roughly 100 GW of capacity from relicensed nuclear units is less than 10 percent of the total requirement that will be met by a mix of DSM, renewable resources, and fossil-fueled resources.

Concern: NGC.007 **Comment:** 079.040 **Subtopic:** Reliability of power supply
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

The NRC's assessment of the need for relicensed nuclear plants is too crude and general to be useful for making decisions. For example, it incorrectly focuses on electric *energy* generation only. The NRC analysis does not make an appropriate distinction between plant operating characteristics—baseload, cycling, peaking—and thereby fails to consider peaking and cycling resources as future electric supply options.

Concern: NGC.004 **Comment:** 079.041 **Subtopic:** State participation
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

The NRC's forecast of load growth is out-of-date and too high. For example, the Energy Infomation Administration forecast of U.S. generation requirements for 2010 has decreased by 366 TWh between the 1990 forecast and the 1991 forecast. This change in forecast demand in just one year amounts to more than one half of the total amount of annual generation from the entire fleet of nuclear plants in the U.S.

Concern: ALT.016 **Comment:** 079.042 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B05 **Org:** State of Vermont

The amount of future capacity actually "needed" is largely a matter of energy policy, rather than an exogenous "given". That is, the amount of future reliance upon DSM (e.g., energy conservation, peak reductions, and fuel switching) is to a large extent a matter of Federal and State regulatory decisions, and research and development emphasis.

Concern: NONE **Comment:** 079.043 **Subtopic:** Data on renewables
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

The amount of future generation from renewable energy resources can effectively be increased through the implementation of policies to encourage their use, and the allocation of research and development funds.

Concern: ALT.016 **Comment:** 079.044 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

The NRC's forecast of the load reductions available from DSM and energy conservation are pessimistic. The NRC's projection of energy conservation savings is for 9 percent energy savings from DSM by the year 2010, based upon an ORNL report that explicitly did not include any "changes in government policy." Studies of energy conservation that allow for cost-effective government policies to encourage conservation indicate that much higher levels of savings can be achieved. For example, the study *America's Energy Choices* found that 43 percent savings could be achieved by 2010.

Concern: ALT.016 **Comment:** 079.045 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

Correcting the GEIS projections for load growth and DSM, the State of Vermont found that for the U.S. in the year 2030, relicensed nuclear capacity has not been shown to be needed.

Concern: ALT.016 **Comment:** 079.046 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

For the New England region, the State of Vermont found that relicensed nuclear capacity has not been shown to be needed in the year 2030.

Concern: GIS.012 **Comment:** 079.047 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

Assessment of the alternatives to license renewal should consider environmental impacts, economic costs, and "tradeoffs" between and among alternatives.

Concern: GIS.012 **Comment:** 079.048 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

The NRC states in the GEIS that "for the nation as a whole, license renewal is preferable from both an environmental and economic perspective to either new fossil-fueled or new nuclear baseload capacity" (GEIS, p. 9-41). Neither the environmental nor the economic components of this conclusion are adequately supported in the GEIS.

Concern: ALT.011 **Comment:** 079.049 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B06 **Org:** State of Vermont

The environmental impact analysis of alternatives in the GEIS is limited primarily to comparison with a new coal unit. There are many other potential alternatives to license renewal, including energy conservation, renewable resources, electricity imports from other countries, and other fossil-fueled generating plants (e.g., natural gas and oil). There is reason to believe that the environmental impacts of these alternatives are attractive relative to those of new coal generation or nuclear relicensing.

Concern: ALT.011 **Comment:** 079.050 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B07 **Org:** State of Vermont

The economic analysis of alternatives in the GEIS is limited to a comparison with a new coal unit. The alternatives are dismissed without sufficient bases.

Concern: ALT.016 **Comment:** 079.051 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B07 **Org:** State of Vermont

DSM is not used in the GEIS economic comparison because the NRC found that there is not enough DSM potential available to satisfy all of the future resource requirements. There are two problems with this dismissal of DSM. First, as noted above, the NRC greatly underestimated the amount of energy reduction achievable by DSM measures. Second, there is a tremendous amount

of energy conservation available, albeit at increasing cost. In any future scenario, there will be further unrealized DSM opportunities that could be used to satisfy electricity demand.

Concern: ALT.030	**Comment:** 079.052	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sedano	**Page:** B07	**Org:** State of Vermont

For renewables, the NRC found that "wind, solar, hydro and biomass are not preferred near-term alternatives to license renewal because of technological limitations (nonbaseload sources), availability and/or economics" (GEIS, p. 9-41). None of these three reasons is sufficient reason for dismissal from consideration in light of the fact that renewal would not begin until 2010 and beyond.

Concern: ALT.030	**Comment:** 079.053	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sedano	**Page:** B07	**Org:** State of Vermont

There is no good reason that nonbaseload sources of energy should be excluded from the analysis as viable alternatives to generate future electrical energy requirements. Cycling and peaking facilities generate energy even though they usually operate at lower capacity factors. Moreover, storage can be installed along with renewable generating equipment to provide baseload service if desirable.

Concern: ALT.030	**Comment:** 079.054	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sedano	**Page:** B07	**Org:** State of Vermont

The NRC is incorrect in dismissing renewable resources, claiming that they are not available. Many of these are feasible today and have been demonstrated in real-world power generation applications.

Concern: ALT.030	**Comment:** 079.055	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Sedano	**Page:** B07	**Org:** State of Vermont

Economics (or high cost) is insufficient reason to dismiss these renewable resources since some renewable technologies are competitive today. Moreover, even those technologies that currently have high costs should be considered in the GEIS since the decisions about many nuclear license renewals are decades in the future, when renewable generating costs may be significantly lower. Finally, even if the costs of these renewable technologies are higher, where their environmental impacts are lower than relicensing, they should be analyzed in the "balancing" portion of the NEPA evaluation.

Concern: GIS.012 **Comment:** 079.056 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B08 **Org:** State of Vermont

State regulatory commissions have begun to require the incorporation of "environmental externalities" in utility planning decisions. This practice could significantly affect the relative economics of the various electric resource alternatives (nuclear, coal, other fossil-fuel technologies, renewable technologies, energy conservation measures, etc.)

Concern: GIS.012 **Comment:** 079.057 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B08 **Org:** State of Vermont

With regard to the NRC conclusion in Section 10.6 that there will be accrued benefits that outweigh the costs of license renewal. The GEIS analysis fails to recognize the wide variations in operating costs and performance characteristics of nuclear generating units in the United States.

Concern: GIS.012 **Comment:** 079.058 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B08 **Org:** State of Vermont

The escalation of nuclear power plant O&M costs has averaged 9.4 percent (in real inflation-adjusted terms) over the period 1974 through 1989. Commenter is concerned that the analysis of the economics of license renewal depends very directly on an assumption that the nuclear plant operating cost escalation experienced in the past will not continue.

Concern: GIS.012 **Comment:** 079.059 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B08 **Org:** State of Vermont

Nuclear unit shutdown decisions are symptomatic of the difficulties associated with aging and operating cost escalation. Commenter believes the recent decisions to shut down the San Onofre 1 and Yankee Rowe units were made because the costs of continued operation were found to exceed the costs of alternative sources of power.

Concern: ALT.005 **Comment:** 079.060 **Subtopic:** Economic analysis-waste storage and disposal
Commenter: Sedano **Page:** B08 **Org:** State of Vermont

The principal environmental impacts of nuclear license renewal are the creation of up to twenty additional years production per plant of HLW and LLW, as well as increased nuclear accident and emissions risks.

Concern: ALT.005 **Comment:** 079.061 **Subtopic:** Economic analysis-waste storage and disposal
Commenter: Sedano **Page:** B08 **Org:** State of Vermont

Radioactive waste disposal costs are a particularly sensitive component of nuclear plant operating and decommissioning costs. The costs of LLW disposal have increased from about \$2 per ft^3 in 1974 to about \$30 per ft^3 in 1989, with further increases likely. Current projected costs for the future range from \$150 to \$400 per ft^3.

Concern: SWM.009 **Comment:** 079.062a **Subtopic:** Spent fuel
Commenter: Sedano **Page:** B09 **Org:** State of Vermont

The spent fuel created by the operation of nuclear power plants is almost exclusively kept onsite in storage pools. These were typically not designed to hold a full 40-year license period's quantity of irradiated fuel, and even with capacity expansions, many plants will reach their full storage capacity prior to the end of their initial licenses. Operation for 20 additional years would put further pressure on storage facilities. New storage facilities will be required, either at the plant sites or at a centralized MRS facility.

Concern: SWM.011 **Comment:** 079.062b **Subtopic:** Spent fuel
Commenter: Sedano **Page:** B09 **Org:** State of Vermont

With license renewal, an estimated 112,000 metric tons of spent fuel will be created, exceeding the 70,000 metric-ton capacity of the HLW repository currently planned for location in Nevada (GEIS, p. 6-35). Thus, license renewal may cause a second repository to be required. The DOE previously attempted to select a site for a second repository and met considerable opposition. As a general matter, the DOE's HLW program (which is intended to accept and store irradiated fuel for the centuries required) is behind schedule and over budget. The timing, costs, and viability of HLW disposal must be considered carefully in making relicensing decisions, and in particular the costs and impacts of a second HLW repository must be evaluated.

Concern: GIS.012 **Comment:** 079.063 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B09 **Org:** State of Vermont

The GEIS treatment of the balancing portion of the NEPA review on pages 10-2 and 10-3 is inadequate. The issue of balancing economic costs against environmental benefits (or against different categories of environmental impacts) should be addressed in a comprehensive and systematic manner.

Concern: ALT.011 **Comment:** 079.064 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B09 **Org:** State of Vermont

The NRC has proposed a "threshold analysis" methodology that is intended to distinguish between individual nuclear units for which continued operation for years 40 through 60 would be

economical, and those units for which it would not. If a particular plant's license renewal application can show that it satisfies the threshold analysis, then "an alternatives analysis need not accompany the renewal application" (GEIS, p. 9-41). The threshold analysis uses: 1) a hypothetical coal-fired plant as the alternative to license renewal, 2) generic assumptions for the costs and performance of the coal unit, 3) 5-year averages of actual data for the nuclear unit's capacity factor and operating costs, and 4) projected nuclear refurbishment cost. All these assumptions are problematic. It is not reasonable to assume that for each region and each point in the future at which plant-specific license renewal decisions must be made, that a coal unit is the appropriate alternative for comparison. A variety of other resources may be relevant alternatives to license renewal in particular instances. These include DSM, importation of power, renewable resources, and gas and oil-fired fossil fuel power plants.

Concern: GIS.012 **Comment:** 079.065 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B10 **Org:** State of Vermont

For any particular system at the relevant point in time there may be surplus generating capacity, so that the alternative to license renewal need not be built immediately. A simple levelized cost analysis, such as the NRC's, overlooks this possibility and so may overstate the economic benefits of license renewal.

Concern: ALT.011 **Comment:** 079.066 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B10 **Org:** State of Vermont

The coal plant characteristics assumed in the NRC's threshold method may not be appropriate for particular actual circumstances. For example, the costs of constructing and operating coal generating capacity vary regionally, if not by company.

Concern: GIS.012 **Comment:** 079.067 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B10 **Org:** State of Vermont

In a period of increasing costs or declining performance, the use of the last five years' average operating characteristics as the future annual operating characteristics is unreasonably optimistic in the absence of sufficient reason to the contrary.

Concern: GIS.012 **Comment:** 079.068 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B10 **Org:** State of Vermont

Little is now known about nuclear plant operating costs and performance at ages beyond 30 years. Projections for operating years 40 through 60 must be considered extremely uncertain.

Concern: LIR.008 **Comment:** 079.069 **Subtopic:** Refurbishment cost
Commenter: Sedano **Page:** B10 **Org:** State of Vermont

Projected costs for refurbishing a nuclear plant for 20 additional years of operation cannot be estimated with confidence. The costs incurred in building these nuclear plants typically exceeded the estimated costs by 200 percent. Nonfuel nuclear plant operating costs have also exceeded expectations by wide margins. Life-extension cost estimates should be viewed with this experience in mind—the engineering cost estimates should be independently reviewed, and appropriate contingency factors should be applied.

Concern: ALT.001 **Comment:** 079.070 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** B11 **Org:** State of Vermont

From the findings identified above, the accuracy of the GEIS forecasts should not be relied upon for a NEPA determination twenty or more years in the future, when there is insufficient reason for such an early determination. Therefore, for the NEPA issues of need for and alternatives to the proposed action, a general conclusion need not and should not be reached at this time for any plant. These issues must be held for specific plant applications at the appropriate time.

Concern: NGC.004 **Comment:** 079.071 **Subtopic:** State participation
Commenter: Biewald **Page:** B11 **Org:** State of Vermont

As a result of the analysis conducted by and for the State of Vermont, there is significant likelihood that nuclear plant license renewal may not be necessary for the State. A generic conclusion on the need for generating capacity need not and should not be reached at this time, but rather, these issues should be reviewed in specific plant applications at the time of license renewal.

Concern: ALT.001 **Comment:** 079.072 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** B11 **Org:** State of Vermont

There is sufficient likelihood that alternatives are available and will be developed that are environmentally and economically preferable to the proposed action. Therefore, a general conclusion regarding alternatives to license renewal has not been demonstrated for any plant. The issue of alternatives to the proposed action must be evaluated in specific plant applications at the appropriate time.

Concern: ALT.001 **Comment:** 079.073 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** B11 **Org:** State of Vermont

The threshold evaluation approach proposed in the GEIS for plant-specific economic evaluations is inadequate to address the issues of accuracy, need, and alternatives.

Concern: NGC.004 **Comment:** 079.074 **Subtopic:** State participation
Commenter: Sedano **Page:** B13 **Org:** State of Vermont

In its GEIS, the NRC has done a simplistic, deterministic analysis of future resource needs and costs. The NRC's analysis is not sufficient to justify the two key electric system planning conclusions that it attempts to reach in the GEIS: that the generation from relicensed nuclear capacity will be "needed", and that the benefits of relicensing will outweigh the costs.

The original operating licenses for the Big Rock Point nuclear unit will expire in 2002, followed by Connecticut Yankee in 2007, and then several others prior to 2010. The NEPA review should be done on a plant-specific basis at the appropriate time. The assessments, even for these oldest of the operating nuclear units, need not be done now. Rather, the economic, environmental, and social costs of license renewal should be assessed closer to the time of expiration of the initial operating licenses of individual plants. For some units that began operating recently, the review need not take place until some time around the year 2020.

Concern: ALT.001 **Comment:** 079.075 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** B13 **Org:** State of Vermont

Electric utility planning studies in recent years have addressed uncertainty systematically through the use of scenario and sensitivity analyses, and techniques to represent key uncertain variables with probability distributions rather than simple deterministic projections (see, for example, Bjorklund 1987, Pacific Gas and Electric Company 1987, and ORNL 1990). ORNL studies have been relied upon by the NRC in many sections of the GEIS. However, in another study perfomed for the DOE, ORNL concluded that:

> Uncertainty is a critical factor that must be considered in utility planning and decision making. Planning only for the base case is too risky. (ORNL 1988)

and that

> Planning should be ongoing because the environment in which utilities operate is changing rapidly. Formal plans should be revised and published regularly (e.g., every two years). (ORNL 1988)

This is sound advice to those responsible for the NEPA evaluation. Given that the uncertainties in key assumptions are large, it is prudent to deal with the uncertainties of the NEPA evaluation systematically and explicitly, to make resource determinations carefully based upon the best data and methods available at the time, and to avoid premature conclusions on major actions based on uncertain assumptions.

Concern: NGC.004 **Comment:** 079.076 **Subtopic:** State participation
Commenter: Sedano **Page:** B14–B16 **Org:** State of Vermont

The North American Electric Reliability Council (NERC) compiles the energy and peak demand forecasts of individual electric utilities on an annual basis. Figure 2.2 shows the aggregate U.S.

summer peak demand forecasts for the years 1974 through 1982. The resulting "porcupine" graph shows a very poor forecasting track record. The average annual growth rate projected for each 10-year forecast period dropped with each new forecast, starting at 7.6 percent for the 1974 forecast and ending at 3.0 percent for the 1982 forecast. Utility construction programs based upon the forecast 7.6 percent load growth turned out to be very costly mistakes—revealed in plant construction project abandonments and excess generating capacity. The Environmental Act Foundation conducted a study of excess generating capacity for a sample of 110 electric companies, and found that in total more than $55 billion had been invested in "excess installed capacity" (Nogee, 1986).

If longer time periods are considered, the magnitude of the forecasting error grows to very large proportions. Decisions for a time period more than a decade into the future are subject to even greater levels of uncertainty, posing an even greater challenge. Where possible, decisions that depend upon uncertain future developments should be deferred to an appropriate time.

Concern: NONE **Comment:** 079.077 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B16 **Org:** State of Vermont

Fossil-fuel prices have been notoriously difficult to predict. The pattern of error in oil price forecasts has been somewhat more complex. After the first large price increase in the early 1970s, oil price forecasts remained flat in constant dollar terms. However, with the second large increase in actual prices in the late 1970s, the forecasters began to predict continued high rates of increase, often several percent above inflation. These forecasts have thus far been much too high. For example, the 1981 forecast anticipated a 1990 oil price of more than $70 per barrel (in 1990 dollars). By 1985, the forecast 1990 price was down to $35 per barrel, and the actual 1990 price was about $20 per barrel. The actual and projected prices of natural gas tend to track those of oil fairly closely. Coal prices, meanwhile, have been much more stable than gas and oil prices.

Concern: GIS.012 **Comment:** 079.078 **Subtopic:** Cost-benefit analysis
Commenter: Biewald **Page:** B16–B18 **Org:** State of Vermont

(This comment is captured in previous Comments 079.034 and 079.058.)

Concern: NGC.004 **Comment:** 079.079 **Subtopic:** State participation
Commenter: Biewald **Page:** B19 **Org:** State of Vermont

A State agency emphasized the need for diversity and flexibility in power system planning. The GEIS should reflect the increase in reliability and flexibility associated with a mix of many small, short lead-time resources as opposed to large power units.

Concern: NGC.004 **Comment:** 079.080 **Subtopic:** State participation
Commenter: Biewald **Page:** B19–B20 **Org:** State of Vermont

The NRC should not be too premature in its findings regarding the need for generating capacity in the GEIS. Conditions and forecasts will change over time, and it is generally unwise to make decisions earlier than is necessary.

Concern: GIS.012 **Comment:** 079.081 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B20 **Org:** State of Vermont

Nuclear plant construction and operating cost estimates have been optimistic in the past, and future estimates should be viewed with appropriate levels of skepticism.

Concern: NGC.004 **Comment:** 079.082 **Subtopic:** State participation
Commenter: Sedano **Page:** B20 **Org:** State of Vermont

Analyses of resource need should recognize key uncertainties through the exploration of scenarios, and other techniques.

Concern: NGC.004 **Comment:** 079.083a **Subtopic:** State participation
Commenter: Sedano **Page:** B21 **Org:** State of Vermont

The NRC's approach to determining need for electric generating capacity has important flaws. Need for capacity is not a generic issue as the NRC treats it, but rather a local issue that should be made on a plant- and system-specific basis at the appropriate time prior to the point at which the particular plant comes up for relicensing. For any unit, it is the utility owner and the associated regulatory bodies that must determine the need for capacity from license renewal for the particular unit, when it comes up for relicensing. Such determinations cannot be made on a national basis for all units twenty to thirty years before most of them will come up for relicensing.

Concern: NGC.007 **Comment:** 079.083b **Subtopic:** Reliability of power supply
Commenter: Sedano **Page:** B21 **Org:** State of Vermont

The NRC has made its determination on the basis of energy requirements alone, without making the appropriate distinctions between energy and peak capacity requirements, without distinguishing between the operating characteristics of different plant types (baseload, cycling, and peaking), and without distinguishing between the *technical* characteristics of power plant operation (availability) and the outcomes of operating decisions (capacity factors). The need for new generating capacity is more appropriately addressed in terms of total MW of capacity to meet peak system demands with sufficient reserve margin for reliability, with the mix of capacity types determined by the operating characteristics and economics of the various power supply alternatives. The GEIS approach neglects the role of peaking and cycling units, underestimates the available energy from currently operating facilities, and thereby, overestimates the need for baseload power supply and nuclear relicensing in particular.

Concern: ALT.016 **Comment:** 079.083c **Subtopic:** Demand side management
Commenter: Sedano **Page:** B21 **Org:** State of Vermont

The NRC's projections of energy deficits suffer from pessimistic forecasts of the amount of energy demand reduction achievable by DSM and renewable resources. Alternative policy options (e.g., aggressive national and local policies to promote energy conservation) should be considered as alternatives to the proposed action.

Concern: NGC.004 **Comment:** 079.083d **Subtopic:** State participation
Commenter: Sedano **Page:** B21 **Org:** State of Vermont

Uncertainty should be factored into any analysis of need. It is important to consider a low-case scenario, where load growth materializes at a slower rate than the base case, prior to reaching a conclusion that capacity from nuclear license renewal will be "needed."

Concern: ALT.016 **Comment:** 079.084 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B23 **Org:** State of Vermont

In Table 3.1, various electricity supply and demand scenarios are presented for the year 2030. The focus is on this year because it is the peak year for the amount of capacity available from nuclear license renewal (see Figure 1.1). For 2030, the maximum amount of generation that could be made available from license renewal is about 511 TWh for the U.S. The NRC's "base case" projection excludes DSM and renewable resources altogether, and finds an energy deficit of 4,538 TWh. With the ORNL forecast of DSM added in, the deficit is reduced to 3,955 TWh. While this energy "gap" is substantial, it is quite possible that a combination of DSM, renewables, extension of existing fossil unit lives, and lower demand growth will "supply" the required amount of electricity.

Concern: ALT.033 **Comment:** 079.085 **Subtopic:** Analysis of alternatives
Commenter: Sedano **Page:** B23 **Org:** State of Vermont

The actual available potential electric generation from renewable resources is much greater than in the ORNL projection of 583 TWh by the year 2030 that is shown on the second line of Table 3.1 of the GEIS. A scenario with aggressive policies for research, development, and demonstration (RD&D) of renewable resources could be, according to the Solar Energy Research Institute, be 3,229 TWh by 2030 (from SERI 1990, with the amount of hydro-electric generation adjusted as is done by the NRC in the GEIS). In Volume 1 of the GEIS, this RD&D renewables scenario is dismissed; but in the technical analysis of Appendix H of the GEIS, the RD&D renewables scenario is used in the calculation of energy deficits. This apparent inconsistency makes somewhat unclear what the NRC believes is the proper forecast of renewable resources to use in determining the "need" for generation from nuclear license renewal. Vermont believes that a proper approach is to use an amount of renewable generation that could be realized if government policies were directed toward the realization of the full cost-effective potential. Whether these will be more cost-effective than nuclear relicensing is a matter best determined at the time that the resource decision actually must be made. In this way, the option of license renewal is not found

to be needed without comparison with other reasonable government actions. With this higher forecast of potential renewable electric generation, the energy deficit is reduced to 726 TWh.

Concern: ALT.016 **Comment:** 079.086 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B24–B25 **Org:** State of Vermont

The NRC developed its "high-conservation case" generation requirements forecast based upon estimates of DSM from an 1990 ORNL report—*Energy Efficiency: How Far Can We Go?* Despite its name, the "high-conservation case" from ORNL used in the GEIS is much too pessimistic about the potential for energy conservation. Other studies, in which policy changes and aggressive programs are considered, indicate that cost-effective energy savings roughly 5-times those projected by ORNL can be achieved.

There is a large body of literature that shows that much cost-effective DSM is not implemented because of institutional and market barriers. A change in government and regulatory policy is an effective instrument to overcome such barriers. A DSM estimate that does not address changes in government and regulatory policy is seriously handicapped from the start, and can be expected to produce only modest savings.

Second, in estimating the cost-effectiveness of the various energy saving measures, a discount rate of 7 percent (real) was assumed in the ORNL report. In its economic evaluation of nuclear plant life-extension, the NRC used a discount rate of 5 percent. For consistency, the NRC should have modified the ORNL results using a discount rate of 5 percent. The DSM energy savings estimates in the report, *America's Energy Choices*, were based on a social discount rate of 3 percent. A lower discount rate can cause a DSM measure to be more cost-effective because it increases the value of (future) benefits relative to the cost of an energy-saving measure.

Concern: NGC.004 **Comment:** 079.087 **Subtopic:** State participation
Commenter: Sedano **Page:** B25–B26 **Org:** State of Vermont

NRC developed a forecast of "existing" generation that would be available to meet its estimates of generation requirements over the period of the study. These projections were based on generation from currently existing and planned capacity, less retirements, from the Data Resources Incorporated Electricity Sector Model in the SAND, 1988 report. There are several problems with the projections of available generation made by the NRC.

First the SAND report used the Electric Power Supply and Demand Report from the NERC published even earlier, and showed capacity additions only until 1995. (The GEIS says capacity additions run only until 1994.) A more recent version of the NERC report (NERC, 1991) shows capacity additions planned through 2000. These additions of capacity that the NRC has not included will add to the energy available from currently existing and planned facilities, and hence would reduce the deficit in generation that the NRC projects using its methodology.

Second, the Sandia report uses a retirement algorithm that reduces the generating capacity after 1994. This algorithm retires all coal plants less than 300 MW after 25 years of operation. For the plants larger than 300 MW, it allows for life extension that adds another 20 years beyond the

25 years of initial operational life. This approach understates the operational life of coal plants significantly. EPRI gives a life of 30 years for coal plants without life extension, and Vermont believes that 40 years is a reasonable assumption. If this under-estimation of the life of coal plants were corrected, the coal plants would add to available energy for more years, and hence the deficit in the NRC's estimated generation requirements would be smaller.

Extending the life of existing fossil-fuel generating capacity may cause additional pollution, as these units generally have less emission control equipment than new fossil generating capacity. The costs and environmental impacts of extending the operation of these units should be compared with the alternatives at the appropriate future date.

Concern: NGC.004 **Comment:** 079.088 **Subtopic:** State participation
Commenter: Sedano **Page:** B26 **Org:** State of Vermont

There is exogenous uncertainty in projections of future electricity demand. For reasons outside of the control of planners and policy makers, future demands may turn out to be significantly higher or lower than a "base case" or "most likely" forecast. This is recognized in NERC's compilation of utility predictions of demand for the year 2000 (NERC, 1991). NERC's perception is that there is an 80 percent probability of the actual year 2000 demand being within about plus or minus 10 percent of the base case.

While the range of uncertainty for the year 2030 is much greater than that for the year 2000, taking the 10 percent low-case forecast as one possible, not-too-extreme future. This change in the forecast increases the 2,030 surplus to 2,885 TWh.

Concern: ALT.015 **Comment:** 079.089a **Subtopic:** Demand forecast
Commenter: Sedano **Page:** B27 **Org:** State of Vermont

Most of the issues raised regarding the NRC's projections for the U.S. are also relevant to its projections for New England. However, one issue deserves special attention. The generation requirements forecast for New England by the NRC is high compared to the forecast recently made by NEPOOL—the operating and planning organization of the region's electric utilities. The forecast made by NEPOOL (with only "business as usual" conservation included) is lower than even the conservation case forecast. The current NEPOOL forecast for the year 2005 is for 134 TWh, 14 percent lower than the NRC's base case forecast for that year.

Concern: ALT.011 **Comment:** 079.089b **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B27 **Org:** State of Vermont

Analysis shows that the generation requirements for New England can be met through a combination of aggressive DSM, increased emphasis upon renewables, and a smaller reduction in existing capacity. The maximum amount of generation available from nuclear license renewal in New England is about 37 TWh in the peak year. Thus, the NRC's "base case" deficit of 161 TWh could be met by some combination of DSM, renewables, existing capacity extension,

and lower load growth— magnitudes of these adjustments discussed above are more than enough to eliminate the supposed electricity deficits.

Concern: ALT.011 **Comment:** 079.090 **Subtopic:** Comparison of alternatives
Commenter: Sedano **Page:** B28 **Org:** State of Vermont

The environmental impact analysis of alternatives in the GEIS is limited primarily to comparison with a new coal unit. There are many other potential alternatives to license renewal, including energy conservation, renewable resources, electricity imports from other countries, and other fossil- fueled generating plants (e.g., natural gas and oil). There is reason to believe that the environmental impacts of these alternatives are attractive relative to those of new coal generation or nuclear relicensing.

The economic analysis of alternatives in the GEIS is similarly limited to comparison with a new coal unit. The alternatives are dismissed without sufficient bases.

Concern: ALT.016 **Comment:** 079.091 **Subtopic:** Demand side management
Commenter: Sedano **Page:** B28 **Org:** State of Vermont

DSM is not used in the GEIS economic comparison because the NRC found that there is not enough DSM potential available to satisfy all of the future resource requirements. There are two problems with this dismissal of DSM. First, the NRC greatly underestimated the amount of energy reduction achievable by DSM measures. The NRC's projection of the achievable demand reductions from DSM explicitly precluded new programs and policies to promote the efficient use of electricity. Second, there is a tremendous amount of energy conservation available, albeit at increasing cost. In any future scenario, there will be further unrealized DSM opportunities that could be used to satisfy electricity demand. Whatever amount of low-cost DSM options may be thought of as "coming before" nuclear license renewal, there will be higher-cost DSM options that "compete" with license renewal on economic grounds. The environmental impacts of many of these measures will likely be attractive compared with license renewal.

Concern: NGC.010 **Comment:** 079.092a **Subtopic:** Determination of need
Commenter: Sedano **Page:** B29 **Org:** State of Vermont

As part of its evaluation of alternatives to nuclear license renewal, the NRC evaluated several renewable technologies and concluded that none of the renewables were a viable option. The NRC concluded that wind, solar, hydro, and biomass are not preferred near-term alternatives to generate future electrical energy requirements. Cycling and peaking facilities generate energy, even though they usually operate at lower capacity factors. One TWh of energy generation from a lower-capacity factor resource can displace one TWh from a high capacity factor resource. While the timing of that generation can influence the value (or "avoided cost") of the electricity, it is hasty to dismiss low-capacity factor resources from consideration for as a means of meeting future energy requirements. Moreover, storage can be installed, along with renewable generating equipment, to provide baseload service if desirable. The NRC is incorrect to dismiss renewable

resources by claiming that they are not available, as many of these are feasible today and have been demonstrated in real-world power generation applications.

Concern: ALT.009 **Comment:** 079.092b **Subtopic:** Cost of alternatives
Commenter: Sedano **Page:** B29 **Org:** State of Vermont

Economics (or high cost) is an insufficient reason to dismiss renewal resources, as some renewable technologies are already competitive today. Even those technologies that currently have high costs may be economically attractive versus relicensing, as the decisions about many nuclear license renewals are decades in the future, at which point renewable generating costs may be significantly lower. Finally, even if the costs of these renewable technologies are higher, where their environmental impacts are lower than relicensing, they should be analyzed in the "balancing portion" of the NEPA evaluation.

Concern: ALT.022 **Comment:** 079.093 **Subtopic:** Natural gas
Commenter: Sedano **Page:** B32 **Org:** State of Vermont

Many utilities with plans to add generating capacity have selected natural gas-fired combustion turbines and combined cycle units as the preferred resource. For example, utilities in the U.S. currently plan to bring online more than 30 GW of new gas fired (utility-owned) capacity by the year 2000 (NERC, 1991). Some of this capacity is for peaking service. In this case, the amount of generation will be relatively low, and requirements for additional electric generation associated with load growth will be met with additional generation from other generating units. For systems that are unbalanced (where the ratio of baseload capacity to peaking capacity is higher than optimal) the future capacity resource of choice will likely be a peaking unit.

Much of the planned new gas generating capacity is combined cycle technology. This provides efficient use of the gas, and such units will generally be used for baseload operation. While gas supply constraints and long-run fuel price escalation are important considerations which must be addressed in planning for baseload gas generation, they are not sufficient reason to reject this option from comparison with nuclear license renewal. The relatively low level of air pollution emitted from these units makes them attractive from an environmental perspective. The relatively low construction and operating costs make gas-fired combined cycle generation attractive from a direct economic perspective.

Concern: GIS.012 **Comment:** 079.094 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B33 **Org:** State of Vermont

Even with the refurbishment envisioned in GEIS Section 2.4 and Appendix B, nuclear plant operating costs may increase and performance may deteriorate with time and aging. The GEIS estimates of nuclear costs cannot be relied upon for determinations twenty to thirty years in the future.

In the NRC's analysis of the economics of continued nuclear plant operation compared with alternatives, it is assumed that nuclear plant operation and maintenance costs will stay at 1989

industry average levels throughout the 20-year license renewal period for each plant. For example, the table on page H-21 of the GEIS indicates that "no change" in nuclear operating costs are assumed between the years 1989 and 2020. Moreover, in Chapter 9 of the GEIS, the costs of solar and geothermal power generation are compared with nuclear production costs of 2.74 cents per kWh (for fuel and O&M, see p. 9-16), which is roughly the 1989 industry average cost of 2.77 cents per kWh (GEIS, p. H-16).

This ignores the possible effects of aging, and the rapid increases in nuclear O&M costs that have occurred over the last 15 years. Moreover, it continues the tradition of unfounded optimism in projecting nuclear O&M costs that has led to costly nuclear plant construction planning decisions over the last decade. In projecting nuclear O&M costs, aging and time trends must be considered. Radioactive waste disposal costs are one important component that is particularly subject to uncertainty, and upside risk.

Concern: GIS.012 **Comment:** 079.095 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B33 **Org:** State of Vermont

There is some evidence for predicting nuclear operating cost increases with plant aging. O&M costs as a function of plant age indicate clearly a strong correlation, with annual costs in later years typically two or three times the costs in earlier years. This may, however, be related to economies of scale, plant vintage, and other factors, rather than age itself. The older units in the database tend to be the smaller units, and it may be that the primary factor driving the higher costs is the small size, rather than increasing costs with plant age. The DOE performed a statistical analysis of O&M costs in which it was unable to draw conclusions about *long-term* aging effects on nuclear plant O&M costs, owing to the sparseness of data for older plants and the highly correlated character of aging and other important variables.

For capital additions the correlation of cost with age is more clear. A statistical analysis of the plant-specific data underlying these averages was performed by the DOE. It found that "no trend for PWRs is apparent", but "the statistical analysis did find that an aging effect existed for all BWRs and for PWRs that use saltwater as a source of cooling" (EIA, 1991).

At this time it is difficult to predict costs for years 20 through 40 of plant operation, and there is very little basis for prediction of operating costs after that point—during the proposed license renewal period.

Concern: GIS.012 **Comment:** 079.096 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B34 **Org:** State of Vermont

Perhaps more important than the effect of aging is the time trend for nuclear operating costs. Whatever the underlying causes of the time trend, it is apparent that continuation of the trend of past increases, even at lower rates of increase, will be very troubling for the economics of nuclear plant license renewal. Even after conducting the plant refurbishment activities outlined in Section 2.4 of the GEIS, some of the factors driving the historic escalation of operating costs may continue to exert upward pressure. The ongoing development and evolution of regulations is surely one of the factors behind the past increases in nuclear operating costs. Regulations

applicable to nuclear power plant operating practice are likely to continue to evolve in the future, as attention is focused upon aging reactors. To date, the rate of increase in nuclear O&M costs has slowed somewhat, but annual average costs continue to increase significantly faster than the rate of general price inflation.

Concern: SWM.011 **Comment:** 079.097 **Subtopic:** Spent fuel
Commenter: Sedano **Page:** B35 **Org:** State of Vermont

The primary HLW created by nuclear power plants is "spent" or "irradiated" fuel. Existing nuclear units have storage pools to hold spent fuel onsite. However, these pools were typically not designed to hold even the amount of spent fuel that will be discharged during the initial operating license period. For example, the GEIS found that:

> . . . 27 plants may run out of storage capacity by January 31, 1998, if the DOE is unable to accept spent fuel for disposal in a MRS facility or permanent repository. . . . Deferral of an MRS or permanent repository would necessitate longer at-reactor storage and would exacerbate current storage capacity limitations (p. 6-29).

Chapter 4 of the GEIS indicates that the high-level and transuranic wastes of the uranium fuel cycle are to be deposited at the Federal repository. Although a site has been proposed for the first repository, the site may not be ready for use until the year 2010. The DOE previously attempted to select a site for a second repository and met considerable opposition. In the meantime, average nuclear reactors generate 30 to 40 tons per year of HLW, and by the year 2000, there will be an estimated 41,000 metric tons (Pace 1990, p. 387). The review of the transport and handling of HLW is cursory in the NRC statement. Once the waste is stored in the Federal depository, the NRC concludes that "no radiological environmental impacts is expected from such disposal" (p. 4-110).

Given the poor history of the Federal radioactive waste disposal program, it would be imprudent to assume that it will be ready to accept fuel in 1998. Moreover, the DOE's costs of disposal are to be recovered from the nuclear plant owners who generate the spent fuel. Currently a fee of 1 mill per kWh is assessed to nuclear generation in order to support the costs of the Federal program. This fee may not be adequate to cover the actual costs of the long-term storage of irradiated fuel. The possibility of a higher fuel disposal cost is one element of nuclear operating cost uncertainty.

Concern: GIS.012 **Comment:** 079.098 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B36 **Org:** State of Vermont

With nuclear unit O&M costs increasing steadily over the last two decades, a point has been reached where the continued operation of certain nuclear units is not economic. To say that license renewal (years 40 through 60 of operation) will be economic on a generic basis jumps ahead of the real issue—whether operation for the entire duration of the *original* operating license is itself economic. For certain nuclear units, "early" shutdown has been found to be desirable. For example, a settlement agreement to retire San Onofre 1 was recently reached. The unit had operated since 1967, and was facing a required expenditure of $135 million in repairs and safety

improvement (EUW, 1992). The California Public Utilities Commission's Division of Ratepayer Advocates performed an economic analysis of San Onofre and found that continued operation was not cost-effective, and would increase overall ratepayer electricity costs by over $150 million (CPUC, 1991). Fourteen other nuclear units have been shutdown "prematurely", generally based upon assessments that the costs of continued operation outweighed the benefits. These facilities are typically the older and smaller nuclear units that will be the first to become candidates for relicensing.

Concern: NGC.004 **Comment:** 079.099a **Subtopic:** State participation
Commenter: Sedano **Page:** B38 **Org:** State of Vermont

Uncertainty is perhaps the only constant in the electric system planning process. Therefore, decisions, such as those associated with nuclear life-extension, need to be robust under conditions of uncertainty. However, the NRC, in its threshold approach to economic analysis, has ignored this important component of planning. For example, it has chosen a new conventional coal plant as the option against which to compare nuclear life extension. This ignores the possibility that, in 2020, there may be other generation options that may be more attractive. Furthermore, the cost of coal plants and other alternatives to nuclear life extension could change considerably by 2020. Moreover, little is now known about the operating cost and performance of nuclear units at ages beyond 40 years. With such uncertainty in important variables it is inappropriate to draw definitive conclusions regarding the economics of nuclear life extension almost 30 years in advance based on current information, or even to prescribe the method of analysis to the level of detail that the NRC has done in its threshold analysis.

Concern: NGC.008 **Comment:** 079.099b **Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Sedano **Page:** B38 **Org:** State of Vermont

In its economic analysis, the NRC computes the costs for competing options in terms of net present value dollars per kW over the life of the option. For this purpose, it uses a capacity factor of 60 percent for both the nuclear and coal options. This approach does not credit coal plants for their higher availability than nuclear plants. Based on the Sandia report that the NRC refers to, the availability of nuclear plants is projected to be about 62 percent in 2015, while the availability of coal plants is projected to be about 80 percent. This means that in order to produce the same amount of electricity for over one year, the coal plant needs only 77.5 percent (62/80) as much capacity as the nuclear plant. Therefore, the costs for the coal plant on a per kW of nuclear equivalent basis should be reduced by the same ratio. This will have a significant negative effect on the relative economic attractiveness of the nuclear life-extension option. An alternative way of comparing options would be to calculate the levelized cost of electricity in cents per kWh from each option, taking appropriate account of their different availabilities.

Concern: GIS.012 **Comment:** 079.100 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** B39 **Org:** State of Vermont

In the threshold analysis that the NRC recommends, it uses projected capital costs for nuclear life extension for the particular plant under consideration. History indicates that projected capital costs for nuclear plants have been much smaller than the actual expenditures incurred, and therefore such cost estimates should be used with caution. For the threshold analysis, appropriate contingency factors should be used to account for the fact that capital costs in the nuclear industry have often been grossly underestimated. Additionally, the NRC recommends the use of a 5-year average of the historical O&M cost for the plant under consideration. This implies that the O&M cost will remain constant at this average for the remaining life of the relicensed nuclear unit. In reality, O&M costs for nuclear plants have shown a rapid escalation, and therefore, the NRC's approach may seriously underestimate the O&M costs for a relicensed nuclear plant. As discussed in Section 2.5, over the last 15 years, nuclear industry average O&M costs have increased at an average annual rate that is 9.4 percentage points faster than the general rate of price inflation. A more appropriate value for O&M costs may be a projection for these costs based on escalation trends for the particular plant.

Concern: ALT.001 **Comment:** 079.101 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** B40 **Org:** State of Vermont

The NRC has claimed that its threshold analysis methodology, based upon an economic comparison with a new coal unit, has some built-in conservatism, and so will identify specific cases where nuclear license renewal is not economical. The State of Vermont indicated that the threshold analysis methodology is inadequate. Instead, full economic and environmental analyses should be done on a plant-specific basis at the appropriate time.

Concern: ALT.001 **Comment:** 079.102 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** C01 **Org:** State of Vermont

In the GEIS, it is stated:

> An analysis of the potential impacts of each available energy technology *at each of the 74 nuclear plant sites* is beyond the scope of this Generic Environmental Impact Statement (Vol. 1, Section 9.1, p. 9-2.) (emphasis added)

An analysis for the State of Vermont and the Vermont Yankee nuclear plant demonstrates there are possibilities that 1) the proposed license renewal of the Vermont Yankee nuclear plant may not be necessary and 2) that environmentally preferable alternatives to license renewal of the Vermont Yankee nuclear plant exist. Since these possibilities exist, the NEPA evaluation for the Vermont Yankee nuclear plant cannot be considered accomplished by the GEIS, and this evaluation must be performed at the time of specific plant license renewal application.

(Basis for Comment 079.110.)

Concern: ALT.002 **Comment:** 079.103 **Subtopic:** State's responsibilities
Commenter: Sedano **Page:** C03 **Org:** State of Vermont

A State agency expressed concern that if the proposed rule is adopted in its present form, an applicant for license renewal may attempt to use the rule in State proceedings to argue that the NRC findings on need and alternatives preempt State determinations. Since the proposed rule identifies nuclear license renewal as being environmentally acceptable, applicants may use these findings to preempt State findings to the contrary.

Concern: NGC.002 **Comment:** 079.104 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sedano **Page:** C04 **Org:** State of Vermont

Recent electrical demand forecasts for Vermont may be reviewed from the *Vermont Comprehensive Energy Plan* ("Energy Plan") (Ref. 1) and from the Vermont Department of Public Service DPS Technical Report No. 16 (Ref. 2). These are existing reports from January 1991 and December 1989, respectively, which have been used in State planning processes. These relatively recent forecasts may be modified by a new forecast which is in progress. The *Energy Plan* projected a base case generation growth from 16.96 Tbtu in 1990 to 28.28 Tbtu in 2010.[1] This corresponds to a 2.59 percent annual growth rate. If the aggregate recommendations of the *Energy Plan* are implemented, generation demand in 2010 is reduced to 20.05 Tbtu, an annual growth rate of 0.84 percent. DPS Technical Report No. 16 considered several demand scenarios. These forecasts were developed using only existing levels of DSM. However, with additional DSM measures which can reasonably be expected to be implemented, strong DSM capacity savings would be achieved. Based on these forecasts, it is possible to choose an aggregate forecast for the year of Vermont Yankee license renewal based on a composite 1.5 percent growth rate from 1988. This results in a 2012 capacity demand in Vermont of 1,372 MW.

(Basis for Comment 079.110.)

Concern: NONE **Comment:** 079.105 **Subtopic:** Determination of need
Commenter: Sedano **Page:** C06 **Org:** State of Vermont

Vermont's existing generation capacity is described in the *Twenty Year Electric Plan* with adjustments that have occurred since the issuance of the plan.

The effect of losing Vermont's share of Vermont Yankee (286 MW) in 2012 is shown below. Using the 2012 capacity demand of 1,372 MW as a reference, the capacity shortfall for these years is as follows:

[1] Energy Plan, Table 5.6, page 183.

Shortfall Capacity (MW)

Item	2011	2012	2013
Reference Demand	1372	1372	1372
Existing Capacity	970	684	653
Shortfall	402	688	719

Concern: NONE **Comment:** 079.106 **Subtopic:** Determination of need
Commenter: Sedano **Page:** C07 **Org:** State of Vermont

The State of Vermont identified sources of capacity that can plausibly be expected to supply capacity needs for the years after Vermont Yankee's license expiration. These sources included a) non-utility generation, b) electrical generation from wood, c) hydroelectric development, d) wind and solar technologies, e) existing coal capacity, and f) purchased capacity from Canada.

(Basis for Comment 079.110.)

Concern: ALT.001 **Comment:** 079.107 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** C11 **Org:** State of Vermont

With the exception of purchasing power from Canada and repowering existing hydroelectric sources which appear to be environmentally superior to nuclear license renewal from the NEPA standpoint, the environmental consideration rests between:

1. The environmental costs of radioactivity from nuclear plants, and

2. The environmental costs of air emissions from coal, oil, natural gas, and wood; and all the aspects of these related fuel cycles, such as coal mining deaths, strip mining, and oil spills.

The environmental costs of radioactivity have been realized to be much more significant than envisioned in the Vermont Yankee FEIS. It is possible that expanded understanding of radiological cancer risks at the time of Vermont Yankee license renewal will result in risks even greater than those stated in BEIR V (1990). Also, it is possible that, even in 2012, there will be no solution for the disposal of HLW and LLW. Therefore, the environmental costs of radioactivity must be considered to be highly significant.

(Basis for Comment 079.110.)

Concern: ALT.001 **Comment:** 079.108 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** C15 **Org:** State of Vermont

The environmental costs of air emissions result primarily from greenhouse gases (carbon dioxide, methane, carbon monoxide, and nitrous oxide) and acid gases (sulfur oxides and nitrogen oxides). Wood gasification and natural gas have significantly lower greenhouse and acid gas emissions than coal and oil sources. Wood gasification environmental costs are offset, in part, because wood is a renewable resource. There are also impacts from the various fuel cycles, such as mining accidents, strip mining impacts, and oil spills. Many uncertainties exist regarding air emissions; much will be learned through continuing research regarding global warming and acid precipitation.

(Basis for Comment 079.110.)

Concern: GIS.012 **Comment:** 079.109 **Subtopic:** Cost-benefit analysis
Commenter: Sedano **Page:** C15 **Org:** State of Vermont

A State agency indicated that 1) the alternatives of purchasing power from Canada and repowering hydroelectric facilities are clearly superior to nuclear license renewal from a NEPA perspective, and 2) the viability of natural gas and wood gasification will become clearer with more research. Therefore, it is undesirable to conclude that nuclear relicensing is needed until the time of the relicensing application. In addition, the NRC must consider qualitative environmental factors as well as quantitative factors in its determinations. At the present in Vermont, there appears to be a specific reluctance to generate and dispose of any further nuclear waste than that to which the State is presently committed. Since this attitude may change with time, the right time for the need for power determination evaluation for Yankee Rowe is at the time of the specific plant application for renewal.

Concern: ALT.001 **Comment:** 079.110 **Subtopic:** Categorization of issues
Commenter: Sedano **Page:** C17 **Org:** State of Vermont

Analysis by the State of Vermont has shown that plausible alternatives to Vermont Yankee license renewal exist which appear to be obviously environmentally superior from the NEPA standpoint. It has also been shown that it is possible to envision a plausible capacity planning scenario in which Vermont Yankee license renewal capacity is not required. Therefore, it is concluded that the GEIS conclusions regarding need-for-power and alternatives are too uncertain to be considered applicable for the State of Vermont and the Vermont Yankee nuclear plant; these issues must be considered at the time of Vermont Yankee's plant-specific license renewal application.

Concern: GIS.013
Commenter: Bram

Comment: 080.001
Page: 2–4

Subtopic: Rulemaking & GEIS approach
Org: Consolidated Edison Company of New York

An electric utility company commented that the NRC should more clearly state in the supplementary information accompanying the proposed rules that only those incremental environmental impacts associated with operation beyond the initial license term need be reviewed for license renewal. The commenter believes this is analogous to the Current Licensing Basis principle which underlies Part 54 regulations for assessing the radiological safety impacts of license renewal. The final Part 51 rule should make it clear that the bases and logic for assessing the radiological and environmental effects of license renewal are the same. Specifically, the commenter proposed the following amendment to Supplementary Information Section III.A. (56 FR 47018):

> ". . . These amendments would require the applicant to address only those environmental issues that require a plant specific assessment as part of an application for each plant. The applicant's environmental review will consider only the extent to which those environmental issues resulting from license renewal reflect new, further or additional impacts beyond those discussed in the NEPA EA and/or EIS prepared at the time of initial licensure of the facility, together with any subsequent amendments or supplements prepared during the initial license term . . . ."

Concern: SWQ.002
Commenter: Bram

Comment: 080.002
Page: 5–11

Subtopic: Water use-refurbishment
Org: Consolidated Edison Company of New York

An electric utility company commented that the NRC should defer to the CWA NPDES/SPDES program since that program adequately regulates and assesses impacts to fish and shellfish resources associated with power plant heat shock, entrainment, and impingement. The commenter believes that since the NRC defers to the NPDES/SPDES program during the entire initial license term, there is no basis for deviating from this practice with respect to license renewal. The commenter pointed out that the NRC concluded in Section 4.2.1.1.2 that conformance with the NPDES/SPDES program is indicative of compliance with water quality standards that ensure protection of aquatic resources. Therefore, the NPDES/SPDES program itself should be sufficient to ensure continuous operation of the plant in a manner that does not adversely affect aquatic ecology. The commenter believes that any analysis of these issues in connection with the NRC's license renewal process serves no substantive purpose and represents the type of duplicative effort that the GEIS methodology seeks to avoid.

Concern: SWQ.005 **Comment:** 080.003 **Subtopic:** Water use-refurbishment
Commenter: Bram **Page:** 12–14 **Org:** Consolidated Edison Company of New York

An electric utility company indicated that compliance with CWA 316(a) and (b) requirements at the time a license renewal application is submitted is not predictive of the plant's status at the end of the initial license period, and should not affect how cooling water intake and thermal discharge issues are addressed by the NRC. In light of the NPDES/SPDES requirement for renewal of discharge permits every 5 years, 316(a) and (b) determinations will necessarily be revisited by cognizant regulatory authorities at least 2 and as many as 4 times between the filing of the application for license renewal and the issuance of the renewed operating license. Because of the significant time interval, the commenter believes the NRC will be unable to infer that a plant with open 316(a) and (b) issues at the time of a license renewal application will be similarly situated at the end of the 40-year initial license.

Concern: SOE.001 **Comment:** 080.004 **Subtopic:** Transportation-categorization
Commenter: Bram **Page:** 15 **Org:** Consolidated Edison Company of New York

An electric utility commented that the transportation impacts of plant refurbishment associated with license renewal should be classified as Category 2. The utility agrees with NUMARC that applying the LOS concept to refurbishment transportation impacts establishes an enveloping criteria that is sufficient to justify a Category 2 finding. Additionally, the utility believes that the significance of any mandatory analysis for refurbishment transportation impacts would be greatly reduced by appropriate recognition that the transportation impacts will actually be spread out over a number of refueling outages.

Concern: ALT.035 **Comment:** 080.005 **Subtopic:** Air quality
Commenter: Bram **Page:** 15 **Org:** Consolidated Edison Company of New York

An electric utility commented that the GEIS should more fully develop the air quality (air emissions avoidance) consequences of its license renewal policies, particularly since nuclear power generates no CO_2, NO_x, or SO_2 emissions. The utility believes that such a consideration should be paramount in evaluating various Part 51 alternatives.

Concern: REG.001 **Comment:** 080.006 **Subtopic:** NUREG-1440-Analysis-approach, assumptions, and data
Commenter: Bram **Page:** 16 **Org:** Consolidated Edison Company of New York

An electric utility company indicated that it reserves the right to comment on the cost impacts of implementation of the NRC's proposed license renewal program. They believe that the analysis of the estimated cost of renewal of power plant operating licenses contained in NUREG-1440 is

premature, given that the Part 51 regulations have not been finalized, and the Part 54 regulations have not been fully implemented.

Docket Number: 081

Concern: NEP.005 **Comment:** 081.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Madison **Page:** 1 **Org:** Don't Waste CA

A public interest group opposes the use of a GEIS for plant license renewal because he believes that aging nuclear power plants, some of which do not meet even current basic construction, seismic and safety standards, will be allowed to continue operating without the benefit of public review and participation in the hearing process. Further, he noted that it was through public insistence that the NRC required Pacific Gas and Electric to conduct more thorough seismic studies and ultimately strengthen the design of the facility at Diablo Canyon, CA. Additionally, because the reactors are geographically dispersed, there are different environmental concerns and these should be addressed on a site-specific basis. Finally, he stated that the NRC is not directed to support the nuclear power industry at all costs, but rather to regulate this industry with the aim of safeguarding the public. Therefore, he believes that the NRC should encourage public participation, comment, and intervention in the consideration of each individual plant up for license renewal.

Concern: GIS.007 **Comment:** 081.002 **Subtopic:** Cost-benefit analysis
Commenter: Madison **Page:** 2 **Org:** Don't Waste CA

A public interest group believes the focus in the GEIS is limited to short-term cost savings and does not consider the long-term costs of license renewal. He believes that given the high rate of system failures, shutdowns for repair, and decreasing efficiency demonstrated by aging reactors currently in operation, it is apparent that renewing an operating license without particular review and subsequent repairs and upgrades will only lead to greater long-term costs in terms of adverse effects on public and environmental health.

Concern: SWM.009 **Comment:** 081.003 **Subtopic:** Spent fuel
Commenter: Madison **Page:** 2 **Org:** Don't Waste CA

A public interest group is concerned that presently there is no appropriate or adequate method of isolating and/or disposing HLW and LLW generated by nuclear plants. He stated that dry cask storage is far from becoming the norm, Federally mandated dumps may not be established by the legislated timelines, and temporary MRS facilities have not yet gone beyond the investigatory stages. He asserted that relicensing these facilities is irresponsible since it allows more of this waste to be produced. He is concerned that this situation could worsen without public participation in the relicensing process.

Concern: AQE.001 **Comment:** 081.004 **Subtopic:** Aquatic ecology-refurbishment/Categorization of issues
Commenter: Madison **Page:** 2 **Org:** Don't Waste CA

A public interest group is concerned that the older plants do not uniformly reflect the implementation of later findings and requirements, and most do not meet the most current, basic specifications for a nuclear power plant. For example, the Marine Review Study of the San Onofre Nuclear Generating Station in CA, took several years to complete and concluded that massive degradation and destruction of the marine environment resulted from the intake/outflow of ocean water for cooling at this plant. He believes these issues need to be raised at renewal hearings.

Concern: NRR.006 **Comment:** 081.005 **Subtopic:** Alternatives to license renewal
Commenter: Madison **Page:** 3 **Org:** Don't Waste CA

A public interest group believes that resources should be invested in the development of renewable energy sources, which do not present the difficulty or hazards inherent in nuclear power. He stated that nuclear power does not alleviate dependence on foreign sources for the fuel, and it will not substantially reduce greenhouse gas emissions.

Docket Number: 081A

Concern: NRR.002 **Comment:** 081A.001 **Subtopic:** GEIS approach
Commenter: Madison **Page:** A-1 **Org:** Nuclear Information and Resource Service

A public interest group believes that the purpose of the proposed Part 51 rule is to cut the public out of the relicensing process by making all important issues generic for all plants. It believes that most issues are site-specific (i.e., Category 3).

Concern: HHI.042 **Comment:** 081A.002 **Subtopic:** Radiation exposure-public/worker
Commenter: Madison **Page:** A-2 **Org:** Nuclear Information and Resource Service

A public interest group is concerned about the conclusion in the proposed Part 51 rule that radiation exposure to the public is a small cost (Table B-1 p. 47031). A study done by a State public health agency of the Pilgrim nuclear power plant concluded that adults living and working within a 10-mile radius have a 4-times greater risk of contracting leukemia. These types of issues need to be challenged at license renewal hearings.

Concern: ALT.011 **Comment:** 081A.003 **Subtopic:** Comparison of alternatives
Commenter: Madison **Page:** A-3 **Org:** Nuclear Information and Resource Service

A public interest group implied that the GEIS comparison of alternatives is limited because it only compared nuclear power plants to coal-fired plants. Many renewable sources, such as wind, solar, geothermal and energy efficiency, have the potential for generating the required capacity.

Concern: AQE.001 **Comment:** 081A.004 **Subtopic:** Aquatic ecology-refurbishment/Categorization of issues
Commenter: Madison **Page:** A-3 **Org:** Nuclear Information and Resource Service

A public interest group disagrees with the proposed Part 51 rule conclusions on the effects of nuclear power plants on water and marine life. A 1989 Marine Review Committee financed by a California utility found that San Onofre Units 2 and 3 seawater cooling systems kill between 21 and 57 tons of fish per year. The systems also take in and discharge so much seawater that they spread out sediments and other debris, which clouds the water. The underwater light is reduced to as little as 16 percent, which hampers the development of juvenile kelp. Additionally, Fermi-2 and other Great Lakes reactors are using chlorination and molluscicides to control zebra mussels and Asiatic clams. Furthermore, more fish have been killed by the Salem plant than have been caught commercially.

Concern: POA.022 **Comment:** 081A.005 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Madison **Page:** A-3 **Org:** Nuclear Information and Resource Service

A public interest group is concerned that the GEIS conclusions on postulated accidents are understated. They implied that the environmental impacts of postulated accidents by extended license would not be a small cost, but rather, there is a greater chance of failure of steam-generator pipes and tubes, and reactor vessels with additional aging. Additionally, a top NRC official admitted in 1986 that the containment vessels on 24 General Electric reactors have a 90 percent chance of failure in a nuclear accident. They also ascertained that complete implementation of the TMI Action Plan has not occurred in many plants and that the NRC is only capable of inspecting 1 percent of each reactor.

Concern: SWM.016 **Comment:** 081A.006 **Subtopic:** Categorization/SWM issues
Commenter: Madison **Page:** A-3 **Org:** Nuclear Information and Resource Service

A public interest group disagrees with the categorization of LLW and HLW issues. Since there may be no dump space by 1993, LLW must be considered at every relicensing hearing.

Concern: SWM.001 **Comment:** 081A.007 **Subtopic:** LLW storage/disposal
Commenter: Madison **Page:** A-4 **Org:** Nuclear Information and Resource Service

A public interest group disagrees with the GEIS methodology in relation to waste handling. The GEIS does not differentiate between the refurbishing and continued operation of the plant. They believe that refurbishment is a partial decommissioning in which every hot component removed will be "low-level" waste. This piece, in turn, may need to be replaced at some time before final decommissioning.

Concern: SWM.009 **Comment:** 081A.008 **Subtopic:** Spent fuel
Commenter: Madison **Page:** A-4 **Org:** Nuclear Information and Resource Service

A public interest group believes the proposed Part 51 rule is deficient because it does not deal with regional and local radioactive waste transportation issues.

Concern: NGC.008 **Comment:** 081A.009 **Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Madison **Page:** A-4 **Org:** Nuclear Information and Resource Service

A public interest group disagrees with the GEIS conclusion that license renewal is the best way to produce the needed electricity. They believe that older reactors have lower capacity factors and less electrical output, and implied that this was not considered in the analysis. They cited that Yankee Rowe, Rancho Seco and San Onofre Unit 1 were closed because they were not cost-effective and they needed major repairs and modifications.

Concern: POA.009 **Comment:** 081A.010 **Subtopic:** Categorization of issues
Commenter: Madison **Page:** A-5 **Org:** Nuclear Information and Resource Service

A public interest group pointed out that the GEIS fails to address emergency planning.

Docket Number: 082

Concern: NEP.005 **Comment:** 082.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Anonymous **Page:** 1 **Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal. With the proposed Part 51 rulemaking, he believes citizens will no longer be able to participate in the license renewal process stating "public concern about safety and health issues with nuclear power is very

high—the public needs to be actively involved, not cut out." Additionally, he stated that the risks associated with nuclear power plants are very site-specific. Therefore, he believes it is essential that an EA is completed for each power plant at license renewal.

Docket Number: 083

Concern: NEP.005	**Comment:** 083.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Smith	**Page:** 1	**Org:** Southeastern Regional Planning and Economic Development District

A regional agency believes that a generic approach to the review of a facility for relicensing is neither appropriate nor acceptable. They believe that relicensing should be considered on a site-specific basis.

Concern: NEP.007	**Comment:** 083.002	**Subtopic:** Cumulative impacts
Commenter: Smith	**Page:** 1	**Org:** Southeastern Regional Planning and Economic Development District

A regional agency believes that the GEIS approach of evaluating impacts on a one-time basis excludes the possibility of evaluating any cumulative effects of these impacts. These cumulative impacts could be significant over a period of time, particularly in terms of safety and environmental health.

Concern: SWM.020	**Comment:** 083.003	**Subtopic:** Radioactive waste disposal/land use
Commenter: Smith	**Page:** 1	**Org:** Southeastern Regional Planning and Economic Development District

A regional agency believes the issue of onsite land use should be given more consideration than appears in the GEIS, particularly in the area of onsite storage of radioactive wastes. There is still no permanent method approved for HLW disposal. This is a long-range land use planning issue which has significant cumulative impacts.

Concern: GIS.015	**Comment:** 083.004	**Subtopic:** Plant performance
Commenter: Smith	**Page:** 1	**Org:** Southeastern Regional Planning and Economic Development District

A regional agency believes that decisions, such as the decision to close Yankee Rowe, would have little or no weight using the GEIS relicensing approach. They recommended that the NRC use this case to reevaluate the significance of older plants and projected plant performance in the relicensing process since this case was resolved while the GEIS was in the comment phase.

Docket Number: 084

Concern: NONE **Comment:** 084.001 **Subtopic:** References Docket No. 63
Commenter: Beard **Page:** 1 **Org:** Florida Power Corporation

An electric utility company supports the comments submitted by NUMARC on the proposed Part 51 rule. They concur with the generic approach taken in the GEIS and support the NRC's position that, under NEPA and relevant case law, it is appropriate to address potential environmental impacts on a generic basis.

Docket Number: 085

Concern: NEP.005 **Comment:** 085.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Cebulla **Page:** 1 **Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal and believes that a full EIS should be prepared for each plant before granting a renewal. Additionally, she believes the proposed Part 51 rule will prevent public participation in the relicensing process.

Concern: HHI.042 **Comment:** 085.002 **Subtopic:** Radiation exposure-public/worker
Commenter: Cebulla **Page:** 1 **Org:** Individual

A private citizen believes that the proposed Part 51 rule will allow plants to continue having unsafe radiation levels. She cited a report prepared by the Nuclear Information and Resource Service (NIRS) which stated that at the Pilgrim nuclear power plant nearby residents have a four-times greater risk of contracting leukemia.

(The NIRS Report is an addendum to Docket 81 and labeled 81A.)

Concern: SWM.001 **Comment:** 085.003 **Subtopic:** LLW storage/disposal
Commenter: Cebulla **Page:** 1 **Org:** Individual

A private citizen believes that the proposed Part 51 rule will allow more production of dangerous waste with no place to store it.

Concern: ALT.011 **Comment:** 085.004 **Subtopic:** Comparison of alternatives
Commenter: Cebulla **Page:** 1 **Org:** Individual

A private citizen believes that the GEIS is limited because coal plants, which she calls cost-inefficient energy production, are the only alternative compared to nuclear power plants. She

referenced a study prepared by the Union of Concerned Scientists which shows how much more cost-effective renewable energy sources are.

Concern: HHI.016 **Comment:** 085.005 **Subtopic:** Safety standards
Commenter: Cebulla **Page:** **Org:** Individual

A private citizen believes States should be allowed to set stricter standards against the dangers of radiation. For example, the requirement that State-licensed "low-level" radioactive waste dumps be designed to leak at the Federally-accepted level rather than at a more protective level should be eliminated.

Docket Number: 086

Concern: NEP.005 **Comment:** 086.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Gauvin **Page:** 1–2 **Org:** Trout Unlimited

A public interest group believes that the proposed Part 51 rule does not allow public input to ensure that the final relicensing decision accurately reflects public comment. Additionally, they believe that environmental impacts should be assessed on a site-by-site basis in order to comply with NEPA and because many of the impacts are inherently local. To comply with NEPA, they believe that all Federal agencies must prepare a detailed report, including the environmental impact of the proposed project, adverse impacts, alternatives, local short-term uses of the environment as opposed to long-term productivity, and irreversible or irretrievable commitments of resources. To support their opinion that local differences warrant individual site impact analyses, they stated that each plant siting has its own topographic conditions, microclimate, geology, water sources, and discharges that must be individually assessed. Furthermore, they believe that the savings projected from the use of a generic impact statement does not warrant the cost avoidance of a site-specific EIS.

Concern: NEP.012 **Comment:** 086.002 **Subtopic:** Regulatory responsibility
Commenter: Gauvin **Page:** 2 **Org:** Trout Unlimited

A public interest group is concerned that impacts that conflict with another ongoing Federal program would not be assessed if a generic rule is adopted. For example, the Federally-sponsored restoration program of the Atlantic salmon may be adversely affected by a thermal plume from the discharge of a nuclear facility, and this would require assessment at time of license renewal.

Concern: AQE.016 **Comment:** 086.003 **Subtopic:** Ecosystems
Commenter: Gauvin **Page:** 2 **Org:** Trout Unlimited

A public interest group is concerned that short-term and long-term effects of the operation of a facility on a river's ecosystem and on migratory movements, because of discharges and

withdrawals, would not be addressed if a generic rule is adopted. In relation to the ecosystem, the affects of thermal and chemical discharges on Atlantic salmon eggs, fry, parr and smolt and native and stocked trout populations may not be addressed. With regards to the migratory movements, the effect of water discharges and withdrawals on migratory movements of Atlantic salmon adults and smolts may not be addressed.

Concern: AQE.016 **Comment:** 086.004 **Subtopic:** Ecosystems
Commenter: Gauvin **Page:** 2 **Org:** Trout Unlimited

A public interest group is concerned that the effect of entrainment and impingement on fish species in and around intake and outflow structures would not be assessed if a generic rule is adopted.

Concern: GIS.014 **Comment:** 086.005 **Subtopic:** Rulemaking & GEIS approach
Commenter: Gauvin **Page:** 2 **Org:** Trout Unlimited

A public interest group believes that the data obtained for the GEIS may have been based on the original licensing. These data and those that may still be absent should be assessed, based on present technological standards that may not have been available at the time of the original license.

Concern: ALT.033 **Comment:** 086.006 **Subtopic:** Analysis of alternatives
Commenter: Gauvin **Page:** 3 **Org:** Trout Unlimited

A public interest group believes that alternatives to relicensing for each facility should be explored, taking into consideration the relative importance of the facility to the regional energy delivery system and alternative sources, including energy conservation and load management.

Docket Number: 087

Concern: NEP.016 **Comment:** 087.001 **Subtopic:** Compliance with other regulations
Commenter: Sanderson **Page:** 2-1 **Org:** U.S. Environmental Protection Agency

The EPA believes the GEIS does not demonstrate compliance with all pertinent regulations, i.e., Federal permits, licenses, approvals, etc. Additionally, neither DG-4002 nor NUREG-1429 calls for a demonstration of compliance.

Concern: NEP.016 **Comment:** 087.002 **Subtopic:** Compliance with other regulations
Commenter: Sanderson **Page:** 2-1 **Org:** U.S. Environmental Protection Agency

The EPA believes that the GEIS approach of generically resolving impacts by citing that the impact is covered in a separate permitting action (e.g., NPDES permit) is deficient because, by

omitting an assessment of the impact, the comparison of alternatives and the cost-benefit analysis becomes superficial. Moreover, the NRC regulation 10 CFR 51.71(d) requires that all environmental impacts [irrespective of whether a certification or license from the appropriate authority has been obtained] be considered. Also, the analysis of mitigation options could be different when considering an additional 20 years of operation instead of the 5-year period covered by the NPDES permit.

Concern: NEP.018 **Comment:** 087.003 **Subtopic:** NRC/State review procedure
Commenter: Sanderson **Page:** 2-2 **Org:** U.S. Environmental Protection Agency

The EPA questioned whether it was appropriate for the NRC to conclude in the preamble of the proposed Part 51 rule that the proposed regulation is the type of action that may be categorically excluded from a NEPA review.

Concern: NEP.001 **Comment:** 087.004 **Subtopic:** Purpose or use of GEIS
Commenter: Sanderson **Page:** 2-3 **Org:** U.S. Environmental Protection Agency

The EPA recommends that the supplemental EAs be "tiered" to the GEIS (see 40 CFR 1502.4, 1502.20–21, and 1508.28) because the GEIS is being prepared long in advance of the license renewal applications and without detailed disclosure of plant-specific impacts. Under this approach, plant-specific NEPA documents would need only summarize and incorporate by reference Category 1 and bounded Category 2 issues discussed in the GEIS, assuming no new information has surfaced. The agency believes tiering will give the public an important opportunity to identify any new information relevant to Category 1 or 2 environmental concerns. Additionally, the EPA recommends that the comment period on plant-specific EAs be extended to 60 days.

Concern: NEP.005 **Comment:** 087.005 **Subtopic:** Public participation/site-specific EISs
Commenter: Sanderson **Page:** 2-3 **Org:** U.S. Environmental Protection Agency

The EPA is concerned that the proposed review process may prevent issues of concern from receiving adequate public review. Therefore, they requested that the NRC describe the petitioning process which the public would use if they were to comment on a relicensing action.

Concern: NEP.005 **Comment:** 087.006 **Subtopic:** Public participation/site-specific EISs
Commenter: Sanderson **Page:** 2-3 **Org:** U.S. Environmental Protection Agency

The EPA cited the CEQ's NEPA 40 CFR 1506.6(b)(3) regulation regarding public involvement, which addresses public notice procedures when the Federal action has effects "primarily of local concern." Though the proposed rulemaking preempts further consideration of Category 1 issues in individual EAs, in accordance with the CEQ, these issues are local concerns in the areas where

nuclear plants are located. Thus, the agency questioned whether the NRC used any of the CEQ public notice procedures.

Concern: REG.006 **Comment:** 087.007 **Subtopic:** NUREG-1429
Commenter: Sanderson **Page:** 2-4 **Org:** U.S. Environmental Protection Agency

The EPA pointed out that both the proposed Part 51 rule and DG-4002 required that applicants describe activities that will be taken to prepare for renewal, and any changes to O&M during renewal. However, no instructions were given to the NRC reviewers in the draft SRP (NUREG-1429) to verify that these activities are bounded by the GEIS. The agency questioned whether these review procedures were in another document; if not, they should be added to the Review Plan. They also questioned how the environmental review would be handled if the applicant's activities were not within the GEIS bounds.

Concern: NEP.020 **Comment:** 087.008a **Subtopic:** Purpose and use of GEIS
Commenter: Sanderson **Page:** 2-4 **Org:** U.S. Environmental Protection Agency

The EPA pointed out that there is a variation in coolant types, and that certain manufacturers constantly modify and upgrade their designs. This leads to site-specific idiosyncrasies that limit the applicability of the GEIS to all reactor license renewal actions. In addition to the unique designs of U.S. reactors, their geographic locations vary greatly both in terms of surrounding population densities and total facility acreage. Given the extremes in population density, the EPA believes that very detailed EAs or EISs will be necessary to adequately address the impacts for each reactor subject to license renewal, despite the potential of the GEIS to aid in drawing conclusions about certain types of impacts.

Concern: GIS.015 **Comment:** 087.008b **Subtopic:** Plant performance
Commenter: Sanderson **Page:** 2-4 **Org:** U.S. Environmental Protection Agency

The EPA believes that the differences in individual plant performances must be taken into account. Plant performance can vary greatly even between plants owned by the same parent company. Therefore, a plant's performance rating should be factored into the GEIS. Moreover, the GEIS does not adequately consider the differences between BWRs and PWRs. BWRs are known to have more extensive contamination and higher exposure levels compared to PWRs, and hence both the external and internal exposures are higher. Therefore, a Category 1 ranking does not seem appropriate.

Concern: TEL.008 **Comment:** 087.009 **Subtopic:** Transmission lines
Commenter: Sanderson **Page:** 2-4 **Org:** U.S. Environmental Protection Agency

The EPA believes that the GEIS appears to assume that there will not be new transmission line construction in existing or new corridors. If this assumption is correct, it should be stated as a condition for the generic conclusions reached regarding impacts associated with transmission lines.

Concern: NEP.005 **Comment:** 087.010 **Subtopic:** Public participation/site-specific EISs
Commenter: Sanderson **Page:** 2-4 **Org:** U.S. Environmental Protection Agency

The EPA pointed out that the GEIS states that periodic reviews of the GEIS conclusions will be conducted but does not state how these will be accomplished and how the public may participate. The agency referred to its previous comments captured in 087.004, 087.005, and 087.006.

Concern: GIS.001 **Comment:** 087.011 **Subtopic:** Categorization of issues
Commenter: Sanderson **Page:** 2-5 **Org:** U.S. Environmental Protection Agency

The EPA disagrees with the GEIS terminology in relation to the magnitude of an impact versus the categorization of an impact. It pointed out that an issue is designated as Category 1 because its impact has been generically quantified and it applies to all plants whether or not the impact is small. The GEIS uses the concept of Category 1 and magnitude of the impact interchangeably in many instances (see Section 3.10, p. 3-43).

Concern: NEP.017 **Comment:** 087.012 **Subtopic:** Mitigation
Commenter: Sanderson **Page:** 2-5 **Org:** U.S. Environmental Protection Agency

The EPA pointed out that even though the GEIS categorizes the majority of issues as generically "small" impacts, the requirement to consider mitigation and, in appropriate cases, monitoring needs to be addressed to comply with 40 CFR 1502.16(h). It appears that the GEIS approach leaves these issues unaddressed. Additionally, issues in the GEIS are presumed to be Category 1 unless compelling evidence is presented to the contrary. In most instances, the GEIS neither supports the conclusions arrived at when categorizing impacts nor provides justification for classifying over 80 percent of the impacts as Category 1, leaving the issues of continued monitoring and mitigation unaddressed.

Concern: GIS.012 **Comment:** 087.013 **Subtopic:** Cost-benefit analysis
Commenter: Sanderson **Page:** 2-5 **Org:** U.S. Environmental Protection Agency

The EPA believes that the allowance for the introduction of plant-specific information appears to be one-sided. DG-4002 states that license renewal applicants may consider those areas where their plant's negative impacts are clearly less severe and the benefits greater than those found generically in the GEIS (p. 43). The allowance of information favorable to renewal may have the tendency to distort the benefit-cost analysis because all Category 1 impacts are designated as having a "small" magnitude and permitting standards are relied upon instead of statements of impacts.

Concern: GIS.012 **Comment:** 087.014 **Subtopic:** Cost-benefit analysis
Commenter: Sanderson **Page:** 2-6 **Org:** U.S. Environmental Protection Agency

The EPA believes that the cost-benefit analysis of relicensing should not be confused with the

analysis required by the CEQ NEPA regulations. The CEQ's regulations, at 40 CFR Part 1500, call for a clear comparison of the alternatives, not a cost-benefit analysis of the proposed action in isolation. A cost-benefit analysis of all alternatives, with results compared across alternatives, is more suited to satisfying these provisions of the NEPA regulations. However, the EPA pointed out that Chapter 9 of the GEIS does compare alternatives in terms of impacts in each media category.

Concern: REG.002 **Comment:** 087.015 **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-1 **Org:** U.S. Environmental Protection Agency

Section 3.4.1, page 3-2; page 10-7

The Regulatory Guide, DG-4002, should have an additional subpart under the "Infomation and Analysis Content for Effects of Refurbishment on Surface Water Quality." This subpart should suggest including a discussion of what evidence is necessary to show that BMPs are sufficient. It should also discuss alternative measures to implement if monitoring shows that BMPs are insufficient to meet water quality standards and to protect beneficial uses of receiving waters. The amount of outside activity that occurs in major refurbishment projects and the associated risks for impact to surface waters require more consideration in bounding which plants can be considered generically and which fall out of the bounding analysis.

Concern: SWQ.010 **Comment:** 087.016 **Subtopic:** Salinity gradients
Commenter: Sanderson **Page:** 3-1 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.2, page 4-5; page 10-7;
Section 4.3.2.2, page 4-26; Section 4.4.2.2, page 4-44

The altered salinity gradients issue should possibly be considered Category 2 since the impact and mitigation by plants with once-through cooling systems, specifically the Oyster Creek Nuclear Generating Station, on salinity gradients may require reevaluation during the relicensing process.

Concern: SWQ.007 **Comment:** 087.017 **Subtopic:** Thermal stratification
Commenter: Sanderson **Page:** 3-1 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.3, page 4-6; page 10-7;
Section 4.3.2.2, page 4-26; Section 4.4.2.2, page 4-44

According to the GEIS, discharge of heating effluents has the potential for altering thermal stratification. In addition to intensifying stratification, changes in circulation may break down stratification. The Temperature Effects on Sediment Transport Capacity issue should be reclassified as Category 2. Since altered thermal stratification is most likely to occur in once-through cooling systems, it should be evaluated on a site-specific basis for plants that produce this effect.

Concern: SWQ.009 **Comment:** 087.018 **Subtopic:** Scouring
Commenter: Sanderson **Page:** 3-2 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.3, page 4-7; page 10-8;
Section 4.3.2.2, page 4-26; Section 4.4.2.2, page 4-44

According to the GEIS, scouring due to discharged cooling water has been found to be a possible problem at plants with once-through cooling systems (e.g., San Onofre Nuclear Generating Station). Scoured sediments have resulted in increased turbidity, decreased light penetration, and increased flow of particulates near the bottom, which have impacted wildlife and habitat.

Concern: SWQ.008 **Comment:** 087.019 **Subtopic:** Chemical effects
Commenter: Sanderson **Page:** 3-2 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.4, page 4-8; page 10-8
Section 4.3.2.2, page 4-26; Section 4.4.2.2, page 4-44

The EPA is currently studying more appropriate control mechanisms to address the in-stream acute and chronic toxicity of biofouling compound discharges. Federal Insecticide, Fungicide, and Rodenticide Act data for biocides commonly only address human toxic reactions, and testing is related only to the "active ingredient". Such datasets fail to provide necessary information on aquatic toxicity or whole product formulation (as used) toxicity. As each facility's discharge characteristics and the receiving water ecology are unique, these impacts should be reclassified as Category 3.

Concern: AQE.007 **Comment:** 087.020 **Subtopic:** Contaminants in sediments or biota
Commenter: Sanderson **Page:** 3-2 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.4, page 4-8; page 10-8
Section 4.3.2.2, page 4-26; Section 4.4.2.2, page 4-44;
Section 4.4.4, page 4-47

On page 4-45, lines 29–30, the GEIS indicates that there has been very little study of metal levels in cooling ponds. Absence of data does not necessarily indicate absence of an effect, particularly in this case where the cumulative effect of 20 additional years of discharge is in question.

Concern: SWQ.004 **Comment:** 087.021 **Subtopic:** Water use conflicts-categorization
Commenter: Sanderson **Page:** 3-2 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.3, page 4-9; page 10-9
Section 4.3.2.1, page 4-24; Section 4.4.2.1, page 4-43

Without proper oversight, utilities may ignore or mitigate rather than avoid secondary and cumulative impacts to natural resource areas outside the plant boundaries. In addition, the current drought conditions across the Midwest and West increase the likelihood that water use conflicts

will increase. Since water use conflicts will need to be dealt with on a plant-by-plant basis, their impacts are not generic in nature and should therefore be considered Category 3 impacts. Although power plant water use issues should be resolved with the appropriate State or Federal agencies, it should be done as part of the relicensing process.

Concern: SWQ.007 **Comment:** 087.022 **Subtopic:** Thermal stratification
Commenter: Sanderson **Page:** 3-3 **Org:** U.S. Environmental Protection Agency

Infomation and discussions of altered thermal stratification in rivers and the availability of makeup water for cooling towers should be provided.

Concern: AQE.006 **Comment:** 087.023 **Subtopic:** Aquatic issues-impacts on aquatic systems
Commenter: Sanderson **Page:** 3-3 **Org:** U.S. Environmental Protection Agency

Section 3.5, page 3-3; page 10-9

Aquatic ecology impacts resulting from refurbishment activities may be different from those associated with initial plant construction or routine operation. Significant improvement in receiving water quality over the past 20 years and the resulting return of indigenous populations of in-stream biota necessitate the reassessment on a site-by-site basis of the aquatic ecology impacts resulting from refurbishment activities. In light of this and the document's statement that there has been measurable accumulation of toxic metals (copper) in sediments and other impacts (e.g., gas bubble disease (GBD), depressed dissolved oxygen), this activity needs to be changed to Category 3.

Concern: AQE.007 **Comment:** 087.024 **Subtopic:** Contaminants in sediments or biota
Commenter: Sanderson **Page:** 3-3 **Org:** U.S. Environmental Protection Agency

Section 4.2.1.2.4, page 4-8; page 10-9
Section 4.3.3, page 4-26; Section 4.4.2.2, page 4-44;
Section 4.4.4, page 4-47

The GEIS does not state that the copper discharge problem, corrected at the cited plant, is not also taking place at any other plants. Moreover, being a cumulative impact, the absence of impact over the past years of operation does not prove that accumulations will not reach damaging levels over the additional 20 years of operation.

Concern: AQE.008 **Comment:** 087.025 **Subtopic:** Cold shock
Commenter: Sanderson **Page:** 3-4 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.5, page 4-18; page 10-10
Section 4.3.3, page 4-26; Section 4.4.4, page 4-47

Cold shock is most likely a Category 1 issue; however, mitigative measures employed should be more fully described to justify the designation.

Concern: NONE **Comment:** 087.026 **Subtopic:** Supportive statement
Commenter: Sanderson **Page:** 3-4 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.7, page 4-9; page 10-10
Section 4.3.3, page 4-26; Section 4.4.4, page 4-47

The comment in the GEIS that localized effects of heated effluents on reproduction of aquatic insects are inconsequential is overstated. For example, premature synchronized emergence of short-lived aquatic insects, such as Mayflies, would most likely affect the local population's ability to reproduce. However, in light of the comparatively small size of the impacted area to the overall habitat, premature emergence of aquatic insects should be considered Category 1, as presented.

Concern: AQE.009 **Comment:** 087.027 **Subtopic:** Gas supersaturation
Commenter: Sanderson **Page:** 3-4 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.8, page 4-19; page 10-10
Section 4.3.3, page 4-26; Section 4.4.4, page 4-47

According to the GEIS, GBD has been mitigated at the nuclear power plant (Pilgrim Nuclear Power Station) where large numbers of fish were affected. However, the GEIS does not indicate that GBD is not occurring at other plants; therefore, GBD should be considered Category 2. Moreover, the GEIS assertion that "plant modification associated with license renewal will not result in greater risk of GBD" does not justify GBD as Category 1 if GBD is already a problem.

Concern: AQE.010 **Comment:** 087.028 **Subtopic:** Low dissolved oxygen
Commenter: Sanderson **Page:** 3-4 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.9, page 4-20; page 10-11
Section 4.3.3, page 4-26; Section 4.4.4, page 4-47

By definition, a "small" impact means that no mitigation or detailed investigation needs to be considered. But the issue of low dissolved oxygen in the discharge has been a concern and is being monitored at the Sequoia plant (GEIS, p. 4-20), which seems to contradict the definition of "small".

Concern: AQE.011 **Comment:** 087.029 **Subtopic:** Aquatic organisms
Commenter: Sanderson **Page:** 3-5 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.10, page 4-20; page 10-11
Section 4.3.3, page 4-26; Section 4.4.4, page 4-47

The literature cited is too limited to adequately evaluate the effect of heat and cold shocks or entrainment on aquatic organisms (i.e., losses from parasitism, predation, and disease). Also, the statement in Section 4.2.3.2, "Although significant localized effects of these stresses have occasionally been demonstrated, the populations' rapid regeneration times and biological compensatory mechanisms are apparently sufficient to preclude long-term or farfield impacts," is excessively presumptive and contradicts a statement under 4.2.3.1.10, ". . . the best evidence for impacts (or lack of impacts) may come from long-term monitoring of fish populations."

Concern: AQE.012 **Comment:** 087.030 **Subtopic:** Entrainment/impingement
Commenter: Sanderson **Page:** 3-5 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.2, page 4-16; page 10-12

While Section 316(b) of the CWA does establish available technology for impingement and entrainment mitigation, the process of refurbishment for extended operation in effect substantively changes the conditions of operation under which these determinations were made. It is appropriate that impingement and entrainment be discussed in the GEIS and considered as part of the relicensing process.

Concern: AQE.012 **Comment:** 087.031 **Subtopic:** Entrainment/impingement
Commenter: Sanderson **Page:** 3-5 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.3, page 4-17; page 10-12

Same as Comment 087.030.

Concern: AQE.012 **Comment:** 087.032 **Subtopic:** Entrainment/impingement
Commenter: Sanderson **Page:** 3-5 **Org:** U.S. Environmental Protection Agency

Section 4.2.3.1.4, page 4-17; page 10-12

While CWA Section 316(a) does provide a mechanism for discharges to adopt alternate thermal effluent limitations, the process of refurbishment and extended operation, in effect, substantively changes the conditions of operation under which these determinations were made. It is appropriate that thermal discharge impacts be discussed in the GEIS and considered as part of the relicensing process.

Concern: AQE.013 **Comment:** 087.033 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Beyond heat and cold shock, the stress of additional heat burden on organisms at the extreme ends of their ranges should be addressed.

Concern: GRW.003 **Comment:** 087.034 **Subtopic:** Water use conflicts
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Section 4.2.2.1.1, page 4-11; page 10-15

Applicants at power plants surrounded by extensive salt marshes should also consider this issue as part of the relicensing process so as not to mine and possibly deplete a potential Paleo-groundwater resource which may not be replenished by recharge.

Concern: GRW.002 **Comment:** 087.035 **Subtopic:** Water use conflicts-categorization
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Section 4.2.2.1.3, page 4-13; page 10-15

A sufficient expendable water supply is essential for the operation of nuclear power plants, especially those with cooling towers or cooling ponds. Since projected human use may compete with power plants for water supply, groundwater use conflicts should be considered Category 2. Although water use or water rights issues should be resolved with the appropriate State or Federal agencies, it should not be settled independently, but should be done as part of the relicensing process to ensure an adequate water supply and equitable water use during the license renewal period.

Concern: GRW.004 **Comment:** 087.036 **Subtopic:** Saltwater intrusion-categorization
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Section 4.2.2.2.1, page 4-14; page 10-16

The issue of groundwater quality degradation due to saltwater intrusion should be considered Category 2. Just because some nuclear power plants are a minor contributor to saltwater intrusion does not preclude their respective impacts on affected aquifers. Moreover, the comment in this section, "Saltwater intrusion into confined aquifers is not yet considered to be a problem in Florida, . . ." is a false statement; saltwater intrusion is occurring which also may justify this as Category 2.

Concern: GRW.001 **Comment:** 087.037 **Subtopic:** Monitoring system
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Section 4.4.3, page 4-46; page 10-16

The GEIS should include provisions for instituting monitoring programs for both the cooling pond water and groundwater of the uppermost aquifer underlying the facility. The monitoring program should be based on an understanding of the site hydrogeology (groundwater flow direction and rate, degree of aquifer interconnection, porosity, and storativity) and should make provisions for quality assurance and quality control of data. The GEIS should also include a paragraph that commits to remedial action(s) should the monitoring programs detect a release of a hazardous

substance pursuant to relevant Federal, State, and local hazardous waste management requirements.

Concern: REG.002 **Comment:** 087.037a **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-6 **Org:** U.S. Environmental Protection Agency

Two additional subparts should be added to DG-4002 requirements for Information and Analysis Content for Effects of Refurbishment on Groundwater Quality. The first new subpart should recommend evaluating all historical information that is available from monitoring cooling pond water and the groundwater of the uppermost aquifer underlying the facility. The second new subpart should emphasize ensuring compliance with all applicable Federal, State, and local hazardous waste management requirements.

Concern: GRW.006 **Comment:** 087.038 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 3-7 **Org:** U.S. Environmental Protection Agency

Potential sink hole information from lowered potentiometric heads in confined aquifers should be evaluated in the relicensing process for power plants that depend on those groundwater resources.

Concern: GRW.005 **Comment:** 087.039 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 3-7 **Org:** U.S. Environmental Protection Agency

Potential impacts on sole source aquifers should also be evaluated in the relicensing process for power plants that rely on such resources.

Concern: TEL.013 **Comment:** 087.040 **Subtopic:** Cooling towers
Commenter: Sanderson **Page:** 3-7 **Org:** U.S. Environmental Protection Agency

Section 4.3.4, page 4-27; page 10-17;
Section 4.3.5.1, page 4-35; page 10-17

Both mechanical and natural draft cooling towers have been shown to cause increased salt deposition within approximately two kilometers of the tower. While the salt drift has been shown to have little impact on offsite crops, the effects of other biocides (e.g., chromium) have not been fully investigated. If, as part of refurbishment, a change in cooling tower biocides is proposed, it may be necessary to perform a site-specific evaluation. The cooling tower impact on crops should therefore be considered Category 2. In addition, cooling towers, particularly mechanical draft cooling towers, have been shown to result in increased heavy metal deposition (chromium and zinc) and vegetative damage possibly from sulfate emissions. The source of these substances appears to be biocides added to the cooling water. As changes in biocides may be a factor in refurbishment, cooling tower impacts on native plants should be considered Category 2.

Concern: TEL.014 **Comment:** 087.041 **Subtopic:** Cooling towers
Commenter: Sanderson **Page:** 3-7 **Org:** U.S. Environmental Protection Agency

Section 4.3.5.1, page 4-35; page 10-17

The impact of icing on native plants at the Palisades Nuclear Plant is not adequately explained to determine if it was a one-time incident. Therefore, cooling tower impacts on native plants possibly should be reconsidered to include potential mitigation at Palisades.

Concern: TEL.004 **Comment:** 087.042 **Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Sanderson **Page:** 3-8 **Org:** U.S. Environmental Protection Agency

Section 4.3.5.2, page 4-38; page 10-17

Illumination of cooling towers should be considered in the relicensing process to reduce avian mortality. Therefore, bird collisions should be considered Category 2 to provide mitigation at those plants with cooling towers that do not have illumination.

Concern: TEL.015 **Comment:** 087.043 **Subtopic:** Power lines
Commenter: Sanderson **Page:** 3-8 **Org:** U.S. Environmental Protection Agency

Section 4.5.6.1, page 4-60; page 10-17

The issue of the impact of power line ROW management on wildlife should be considered Category 2 to ensure that two stipulations are included in the license renewal: (1) only herbicides approved for ROW use by the EPA are employed; and (2) application is done exclusively by a licensed operator. These conditions are not presented in the GEIS as current requirements.

Concern: TEL.004 **Comment:** 087.044 **Subtopic:** Bird collisions-cooling towers/power lines
Commenter: Sanderson **Page:** 3-8 **Org:** U.S. Environmental Protection Agency

Section 4.5.6.2, page 4-63; page 10-18

The issue of bird collisions with power lines should be reconsidered as Category 2 for power plant associated transmission lines that cross wetlands used by large concentrations of birds or that transect major flyways. Mitigative measures for these lines should be considered as part of the relicensing process (e.g., orange aviation balls, spiral vibration dampers).

Concern: TEL.015 **Comment:** 087.045 **Subtopic:** Power lines
Commenter: Sanderson **Page:** 3-8 **Org:** U.S. Environmental Protection Agency

Section 4.5.7, page 4-70; page 10-18

The impact of power line ROW on floodplains and wetlands should be considered Category 2 to ensure that two stipulations are included in the license renewal: (1) if new line construction occurs, it should avoid bogs because of their extremely slow recovery; and (2) line maintenance in wetlands should occur in winter, whenever possible, to minimize damage to vegetation. It is essential that the proposed rule clarify what is meant by "standard practices" at this stage. This is critical for disclosure purposes, so that there is adequate opportunity for review of those "standard practices".

Concern: REG.002 **Comment:** 087.046 **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-9 **Org:** U.S. Environmental Protection Agency

Section 3.5, page 3-3; page 10-18
Section 3.6, page 3-4; Section 4.2.1.1, page 4-2

DG-4002 should add the following provision to Information and Analysis Content for Threatened or Endangered Species: "If, after review by the appropriate FWS or NMFS Office, it is determined that relicensing and its associated activities will affect a threatened or endangered species, a Section 7 consultation with the FWS or NMFS, as appropriate, should follow." The GEIS and DG-4002 should also indicate that applicants are to determine if "candidate" species are present.

Concern: ARQ.001 **Comment:** 087.047 **Subtopic:** Categorization of issues
Commenter: Sanderson **Page:** 3-9 **Org:** U.S. Environmental Protection Agency

Section 3.3, page 3-2; page 10-19

To the extent that relicensing a nuclear power plant may cause or contribute to any new violation or increase the frequency or severity of any existing violation, the project may not conform with the requirements of the CAA. The GEIS should discuss these issues. Further, the air quality issue should be classified as Category 2, and applicants in non-attainment areas undertaking relicensing should prepare supplemental environmental documentation, which should specifically discuss project conformity with the requirements of the CAA, as amended.

Concern: HHI.001 **Comment:** 087.048 **Subtopic:** Radiation exposure-public/worker
Commenter: Sanderson **Page:** 3-9 **Org:** U.S. Environmental Protection Agency

Section 3.8.1.7, page 3-37; page 10-19

Throughout the GEIS and in Table B-1 of the proposed rule, radiation doses are assigned to Category 1 because the NRC reached a conclusion about the impact that applies to all affected plants. Although EPA concurs with the conclusion that the radiation exposures are small, comparison to natural background is not a compelling argument. A more appropriate argument is that the risks associated with the exposures are consistent with the risks judged not to warrant mitigative measures. Another appropriate assignment is that the risks are comparable to, or less than, the risks associated with the alternatives to license renewal.

Concern: HHI.029 **Comment:** 087.049 **Subtopic:** Radiation exposure-public/worker
Commenter: Sanderson **Page:** 3-10 **Org:** U.S. Environmental Protection Agency

The risk coefficients provided in Table 3-10 (p. 3-32) are somewhat misleading. The table states that the range of the risk of fatal cancer is 0 to 4E-04 per rem for occupational exposure and 0 to 5E-04 per rem for exposure of the public. However, the 90 percent confidence limit for fatal cancers cited in the BEIR V report is 1.2E-03 per rem for adults. Even accounting for the dose rate reduction factor, the values reported in the GEIS appear low.

Concern: HHI.019 **Comment:** 087.050 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-10 **Org:** U.S. Environmental Protection Agency

Section 3.8.1.5 (p. 3-32) refers to the offsite doses due to refurbishment activities as being comparable to the doses from routine operation. Some discussion is needed of the potential releases of hot particles, which can deliver relatively high localized dose rates. During routine operations, offsite exposures to hot particles are unlikely. However, hot particles can be generated during refurbishment activities and should be addressed.

Concern: HHI.020 **Comment:** 087.051 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-10 **Org:** U.S. Environmental Protection Agency

On page 3-31, the GEIS states that the somatic and genetic risk estimators used were the ones employed by the NRC in the *Federal Register* notice promulgating the new NRC "below regulatory concern" (BRC) policy. It should be noted that the NRC has deferred actions on petitions for rulemaking that deal with "BRC" in order to initiate a "consensus building process." This resulted from the onslaught of adverse criticism that this concept generated. The EPA believes the use of this policy in conjunction with risk estimates for radiation exposure is inappropriate.

Concern: HHI.021 **Comment:** 087.052 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

Section 3.8.2.4, page 3-42; page 10-19

The conclusion on page 3-42 that the "upper-limit cancer and genetic risks from radiation exposures attributable to refurbishment were compared with natural incidence and found to be much less than 1 percent of the natural background rates" is not very reassuring. The natural incidence of fatal cancer is 1 in 5, and the natural incidence of serious genetic effects is about 6 percent of all births. In addition, cancer and genetic effects are not necessarily "natural". At least a portion of the incidence is likely due to anthropomorphic sources of environmental mutagens. EPA concurs in the conclusion that occupational exposures are Category 1; however, it is difficult to conclude that the exposures are small. A 1 percent chance of acquiring cancer is not small. CERCLA establishes that a negligibly small lifetime risk of cancer is in the range of 1E-06 to 1E-04.

Concern: HHI.022 **Comment:** 087.053 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

The occupational and public doses associated with refurbishment and replacement activities, as listed in Table 2.6 (p. 2-31), have been assigned to Category 1. The EPA questioned how the license renewal process would proceed if the applicant plans on activities that include replacement of the pressure vessel, or some other relatively intrusive activity.

Concern: HHI.022 **Comment:** 087.054 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

A review of operating experience associated with major component replacement reveals occupational doses from steam generator repairs as high as 3,500 person rems, 872,000 work hours, and a 10-month outage. The exposures and outage duration are somewhat higher than those in Table 2-7 (p. 2-33).

Concern: NONE **Comment:** 087.055 **Subtopic:** Supportive statement
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

The EPA concurs with the cumulative occupational dose values.

Concern: NONE **Comment:** 087.056 **Subtopic:** Supportive statement
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

The EPA concurs with the costs of plant modifications reported on page 3-39.

Concern: HHI.023 **Comment:** 087.057 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-11 **Org:** U.S. Environmental Protection Agency

The GEIS reference to "relatively high collective occupational doses" on page 3-39 should be quantified and the scenarios under which this would occur should be defined. Since the man-rem dose levels are already diluted by a high number of low-level radiation workers who rarely receive any dose at all, it seems that the actual doses to the "real" radiation worker is not accurately reflected.

Concern: HHI.023 **Comment:** 087.058 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-12 **Org:** U.S. Environmental Protection Agency

The GEIS assumes that the risk is small by providing exposure results from the nuclear industry. But these numbers are not realistic because they include a high number of personnel who are considered radiation workers, as well as support personnel, who all wear dosimeters but rarely receive any significant dose. Thus, the actual cancer risk to "hard core workers" is higher than what the GEIS suggests.

Concern: HHI.010 **Comment:** 087.059 **Subtopic:** Electromagnetic fields impact
Commenter: Sanderson **Page:** 3-12 **Org:** U.S. Environmental Protection Agency

Section 4.5.4.2, page 4-57; page 10-20

It is premature to determine that the scale and direction of EMF is small when even the evaluation of recent research has not been completed by the EPA. Given the current status of knowledge about EMF impacts, this issue should be considered in the relicensing process for each facility. The proposed rulemaking should state that (1) the EPA is evaluating the public health effects of EMF, and (2) the renewal procedure will address the EPA's position relative to public health at the time of renewal.

Concern: HHI.024 **Comment:** 087.060 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-12 **Org:** U.S. Environmental Protection Agency

Section 4.6.2.4, page 4-82; page 10-20

The population doses from routine emissions are somewhat misleading because they do not account for the complete environmental dose commitment from the very long-lived emissions, e.g., C-14. The environmental dose commitment from C-14 alone is about 4,000 person rem/yr/plant. The data presented in Tables 4.7 and 4.8 do not appear to include this aspect.

Concern: HHI.025 **Comment:** 087.061 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

The EPA asked how cooling tower drift affects the dispersion and deposition of the atmospheric discharge of radioiodines and particulates.

Concern: NONE **Comment:** 087.062 **Subtopic:** Nonconcern
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

The EPA notes that the values given in Table 4.6 are reasonable, if not conservative.

Concern: HHI.001 **Comment:** 087.063 **Subtopic:** Radiation exposure-public/worker
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

A comparison to background radiation (e.g., p. 4-80) should be avoided since it implies that the risk of natural background is negligible. Also, using the average dose within a 50-mile radius of a plant seems arbitrary. There are two kinds of assessments that are relevant: (1) the maximum dose to members of the public; and (2) the collective dose to the world's population that results from the anticipated license renewal period of a nuclear plant.

Concern: HHI.026 **Comment:** 087.064 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

The discussion of trends in page 4-80 may be misleading because it is not apparent that these trends will continue. It is probably more appropriate to assume that the routine release rates will remain fairly constant during the license renewal period.

Concern: NONE **Comment:** 087.065 **Subtopic:** Nonconcern
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

The assumed two-fold increase in population (p. 4-82) is conservative.

Concern: HHI.027 **Comment:** 087.066 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-13 **Org:** U.S. Environmental Protection Agency

Section 4.6.3.3, page 4-85; page 10-21

The discussion should also point out that the doses from internal emitters are a very small fraction of the reported external doses and that the doses are predominantly from low-linear energy transfer radiation. This has significance in terms of assessing the risks from exposures.

Concern: HHI.023 **Comment:** 087.067 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-14 **Org:** U.S. Environmental Protection Agency

The GEIS should address the possibility that the declining average annual occupational dose rates (Table 4.10) may be due, in part, to the practice of badging an increasing number of site personnel even though many of them have little potential for exposure.

Concern: HHI.028 **Comment:** 087.068 **Subtopic:** Occupational exposure
Commenter: Sanderson **Page:** 3-14 **Org:** U.S. Environmental Protection Agency

The low dose rates associated with occupational dose are likened to exposures to background radiation (p. 4-84). This is somewhat confusing because, unlike exposures to background radiation, occupational exposures are delivered at a relatively high dose rate (i.e., mrem/hr to rem/hr) as compared to background radiation.

Concern: REG.002 **Comment:** 087.069 **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-14 **Org:** U.S. Environmental Protection Agency

Section 3.7.4.2, page 3-15; page 10-22

DG-4002 should add a subpart to the section on Information and Analysis Content for Transportation Impacts of Refurbishment. The new subpart should recommend evaluating air

quality impacts, particularly in nonattainment areas. Air quality assessments should include carbon monoxide, particulate matter, ozone, and reactive organic gases.

Concern: SOE.010 **Comment:** 087.070 **Subtopic:** Aesthetic impacts
Commenter: Sanderson **Page:** 3-14 **Org:** U.S. Environmental Protection Agency

Section 3.7.7, page 3-22; page 10-23

The closer review that would be afforded in an impact assessment for each plant's license renewal may be the best available mechanism for ensuring that significant aesthetic impacts are not overlooked. Aesthetic impacts should perhaps be designated Category 2, subject to consideration in the license renewal for plants that will undertake refurbishment activities beyond certain pre-determined bounds.

Concern: SOE.011 **Comment:** 087.071 **Subtopic:** Tax-driven changes
Commenter: Sanderson **Page:** 3-14 **Org:** U.S. Environmental Protection Agency

Section 4.7.5, page 4-95; page 10-22

The GEIS concludes that tax-driven changes cannot be categorized as having a positive or negative impact and therefore is Category 1. However, the prospect that relicensing could result in what some people would consider to be a significant negative impact would seem to suggest that this impact be subject to review in certain license renewal reviews. Bounds could be set such that this impact would need to be reviewed only for certain plants.

Concern: SOE.007 **Comment:** 087.072 **Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Sanderson **Page:** 3-15 **Org:** U.S. Environmental Protection Agency

Section 4.5.8, page 4-71; page 10-22

Since there was very little description of the affected environments and of the impacts, the conclusion that the impacts [of transmission lines on historic resources] is Category 1 is not satisfactorily substantiated. Also, there should be a clarification that the conclusion applies only to existing transmission lines.

Concern: SOE.007 **Comment:** 087.073 **Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Sanderson **Page:** 3-15 **Org:** U.S. Environmental Protection Agency

Section 4.7.7, page 4-98; page 10-23

The conclusion that the historic resources impacts of the license renewal term is Category 1 is not satisfactorily substantiated.

Concern: SOE.010 **Comment:** 087.074 **Subtopic:** Aesthetic impacts
Commenter: Sanderson **Page:** 3-15 **Org:** U.S. Environmental Protection Agency

Section 4.7.7, page 4-98; page 10-23

The conclusion that the aesthetic impacts of the license renewal term is Category 1 is not satisfactorily substantiated.

Concern: SOE.010 **Comment:** 087.075 **Subtopic:** Aesthetic impacts
Commenter: Sanderson **Page:** 3-15 **Org:** U.S. Environmental Protection Agency

Section 4.5.8, page 4-71; page 10-23

The conclusion that the aesthetic impacts of transmission lines is Category 1 is not satisfactorily substantiated.

Concern: HHI.030 **Comment:** 087.076 **Subtopic:** Uranium fuel cycle
Commenter: Sanderson **Page:** 3-16 **Org:** U.S. Environmental Protection Agency

Section 4.8, page 4-101; page 10-23

Natural background radiation is not a good criterion for concluding that the impacts of the uranium fuel cycle are small. The emphasis should be on impacts relative to the currently feasible alternatives, as summarized in Tables 9.1 and 9.2.

Concern: HHI.031 **Comment:** 087.077 **Subtopic:** Uranium fuel cycle
Commenter: Sanderson **Page:** 3-16 **Org:** U.S. Environmental Protection Agency

The impacts from radon emissions from the fuel cycle should be expressed in terms of person working level months (WLMs), in addition to dose, since the risk coefficients for exposure to radon progeny are correlated to exposures expressed in WLMs.

Concern: HHI.032 **Comment:** 087.078 **Subtopic:** Uranium fuel cycle
Commenter: Sanderson **Page:** 3-16 **Org:** U.S. Environmental Protection Agency

The NRC's assessment of the public health impact of fuel cycle operations is incomplete and is currently the subject of a rulemaking hearing that will be concluded after the GEIS is completed. The revision of the 10 CFR Part 51 Table S-3 should be completed before the GEIS is completed, and reviewed along with the GEIS. Current deficiencies of Table S-3 include (1) calculation of health impacts on an inconsistent basis for different radionuclides; and (2) the timeframe for assessments should preferably be the same as that for HLW (10,000 years). In cases where pathway calculation are available for longer timeframes (e.g., 1-129), a 1,000 year timeframe could be used. The GEIS and Table S-3 use inconsistent health risk coefficients. The GEIS used 5×10^{-4} rem $^{-1}$; Table S-3 used 2×10^{-4}.

Concern: HHI.033 **Comment:** 087.079 **Subtopic:** Radiation exposure-public/worker
Commenter: Sanderson **Page:** 3-16 **Org:** U.S. Environmental Protection Agency

The doses and risks associated with the management of HLW and LLW should refer to the generic analyses perfomed in support of 10 CFR Parts 60 and 61. For HLW, the design criterion is 10 effects per 10,000 years per 1,000 metric tons of initial heavy metal.

Concern: SWM.008 **Comment:** 087.080 **Subtopic:** Spent fuel and LLW
Commenter: Sanderson **Page:** 3-17 **Org:** U.S. Environmental Protection Agency

The GEIS should expand its discussion of the applicability of Table S-3 to the license renewal period. In general, Table S-3 has several conservatisms that provide assurance that it applies to a broad range of conditions, such as commitment of land, inclusion of reprocessing, resource consumption (water use) for uranium enrichment, overestimated nonradiological emissions, overestimated LLW volumes. The values in Table S-3 reflect the sum of the highest impacts of each component of the fuel cycle for the once-through and recycle mode.

Concern: SWM.008 **Comment:** 087.081 **Subtopic:** Spent fuel and LLW
Commenter: Sanderson **Page:** 3-17 **Org:** U.S. Environmental Protection Agency

Since the NRC has ruled that Table S-3 also applies to extended fuel burn-up, the GEIS should clarify that the use of extended burn-up during the license renewal period does not invalidate Table S-3. This ruling also applies to Table S-4 of 10 CFR Part 51, which addresses transportation impacts of the fuel cycle.

Concern: SWQ.011 **Comment:** 087.082 **Subtopic:** Uranium fuel cycle
Commenter: Sanderson **Page:** 3-18 **Org:** U.S. Environmental Protection Agency

The GEIS should contain a more detailed justification for its treatment of surface water and aquatic ecology impacts from extension of the fuel cycle life resulting from relicensing. Additional fuel mining, milling, separation, enrichment, and processing will all have quantifiable negative impacts on the surface waters of the U.S.

Concern: SWM.015 **Comment:** 087.083 **Subtopic:** Nonradiological waste
Commenter: Sanderson **Page:** 3-18 **Org:** U.S. Environmental Protection Agency

Section 6.2, page 6-3; page 10-24

Information is not provided to substantiate a conclusion that there are no concerns with nonradiological waste disposal at any plant. The GEIS does not discuss whether there is ample disposal capacity for any large quantities of construction debris that may be generated. As for hazardous waste management, the GEIS relies on the RCRA without describing the generation of hazardous waste or evaluating the impacts of hazardous waste management. The GEIS should include a paragraph on solid waste management which acknowledges the Pollution Prevention Act

of 1990 and endorses its policy that, ". . . pollution should be prevented or reduced at the source whenever feasible . . . ."

Concern: SWM.037 **Comment:** 087.084 **Subtopic:** LLW storage
Commenter: Sanderson **Page:** 3-18 **Org:** U.S. Environmental Protection Agency

Section 6.3.2, page 6-16; page 10-25

A discussion is needed regarding how decontamination and decommissioning (D&D) impacts may change if LLW is stored onsite for the 20-year license renewal period.

Concern: SWM.038 **Comment:** 087.085 **Subtopic:** LLW storage
Commenter: Sanderson **Page:** 3-18 **Org:** U.S. Environmental Protection Agency

The fact that onsite storage of LLW can be managed within occupational and public radiation exposure limits does not mean the impacts are insignificant (see p. 6-21). They should be quantified.

Concern: REG.002 **Comment:** 087.085a **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-18 **Org:** U.S. Environmental Protection Agency

DG-4002 should provide additional guidance for determining when the impact of onsite storage of LLW is other than small and thereby requires a mitigation plan.

Concern: SWM.039 **Comment:** 087.086 **Subtopic:** LLW disposal
Commenter: Sanderson **Page:** 3-19 **Org:** U.S. Environmental Protection Agency

Section 6.3.3, page 6-21; page 10-25

Contrary to statement at bottom of page 6-1, the fact that (1) each applicant for a license to own and operate a LLW disposal facility is required to prepare a Safety Analysis Report and an environmental report, and (2) the NRC will prepare an EIS for each license implies that the impacts of LLW disposal are not insignificant. These impacts should be quantified, discussed, and explicitly factored into the cost-benefit balance in the GEIS.

Concern: SWM.011 **Comment:** 087.087 **Subtopic:** Spent fuel
Commenter: Sanderson **Page:** 3-19 **Org:** U.S. Environmental Protection Agency

The fact that the impacts of spent fuel management are managed under 10 CFR Part 60 does not mean that the impacts are negligible. They should be explicitly addressed.

Concern: SWM.040 **Comment:** 087.088 **Subtopic:** LLW disposal
Commenter: Sanderson **Page:** 3-19 **Org:** U.S. Environmental Protection Agency

The use of 100 cpm above background as a cutoff criterion for when trash is disposed of as LLW instead of transported to a landfill is a de-facto BRC criterion. The NRC has withdrawn the BRC policy statement pending a negotiated rulemaking.

Concern: REG.002 **Comment:** 087.088a **Subtopic:** DG-4002-Editorial comments
Commenter: Sanderson **Page:** 3-19 **Org:** U.S. Environmental Protection Agency

DG-4002 should provide additional guidance for determining when the LLW disposal impact is other than small and thereby requires a mitigation plan.

Concern: SWM.014 **Comment:** 087.089 **Subtopic:** Mixed waste
Commenter: Sanderson **Page:** 3-19 **Org:** U.S. Environmental Protection Agency

Section 6.4, page 6-26; page 10-15

The impacts of mixed waste should be assigned to Category 2 because a general conclusion cannot be made regarding whether the waste will be stored onsite or disposed of at a licensed facility. Until disposal capacity for mixed waste is available, it is not prudent to relicense plants without considering what disposal capacity will be available.

Concern: SWM.013 **Comment:** 087.090 **Subtopic:** Mixed waste
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

A recent EPA contractor report, *Integration of ALARA with RCRA Requirements for Radioactive Mixed Hazardous Waste* addresses the applicability of ALARA to the RCRA requirements. The status of this work should be discussed with EPA to determine its applicability to the mixed waste issue in the GEIS.

Concern: SWM.041 **Comment:** 087.091 **Subtopic:** Mixed waste
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

Because the extended life cycle of nuclear power plants will substantially increase the quantities of mixed wastes, the ability of each site to adequately control mixed wastes onsite should be considered.

Concern: SWM.008 **Comment:** 087.092 **Subtopic:** Spent fuel and LLW
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

Section 6.5, page 6-28; page 10-25

Same as Comment 087.080.

Concern: SWM.038 **Comment:** 087.093 **Subtopic:** LLW storage
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

Same as Comment 087.085.

Concern: SWM.042 **Comment:** 087.094 **Subtopic:** Spent fuel
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

Advocating the use of pool and dry storage methods to temporarily accommodate spent fuel avoids addressing the larger issue of identifying reasonable long-term storage for spent fuel. The NRC should consider focusing on solving the long-term storage problem and then proceed with license renewal.

Concern: SWM.032 **Comment:** 087.095 **Subtopic:** Spent fuel
Commenter: Sanderson **Page:** 3-20 **Org:** U.S. Environmental Protection Agency

There is little indication from the discussion (Section 6.5) about the technical feasibility and availability of dry storage methods to accommodate spent fuel at each nuclear power plant. The EPA does not know which utilities are pursuing dry storage methods as an option, how many nuclear power plants in the U.S. can utilize these storage techniques, and how much fuel could be stored in this manner. Without this infomation, it is difficult to agree with the conclusion that dry storage can accommodate the additional spent fuel created after the completion of the renewal period.

Concern: POA.004 **Comment:** 087.096 **Subtopic:** Categorization
Commenter: Sanderson **Page:** 3-21 **Org:** U.S. Environmental Protection Agency

Section 5.3.3.2, page 5-17; page 10-24

The severe accident analysis in the GEIS is based on the severe accident analysis given in the FEISs for 28 plants. This means that a single source term and core melt frequency was used for each of the 17 PWRs, and another source term and core melt frequency was used for each of the 11 BWRs. Use of a single "generic" source term for each of the two plant types hardly seems to satisfy the expressed intent to perform a bounding analysis using plant and site-specific data. Without bounding the impacts or establishing the envelope, it is not possible to conclude that the impacts are addressed by the GEIS once and for all (i.e., Category 1). The NRC might consider reclassifying severe accidents as Category 2. Once the IPEs have been completed, each licensee

could determine whether the plant-specific source terms and core melt frequencies derived in the IPE fall within the bounds of the generic reactor safety study source terms and core melt frequencies used in the GEIS.

Concern: POA.016 **Comment:** 087.097 **Subtopic:** Severe accidents
Commenter: Sanderson **Page:** 3-22 **Org:** U.S. Environmental Protection Agency

An implicit assumption in the severe accident analysis is that accident frequencies will not increase during the period of license renewal "because regulatory controls ensure that the plant's licensing basis is maintained and improved, where warranted" (Section 5.5). It is not clear that the management of aging through maintenance of the plant's licensing basis will necessarily maintain the risk from severe accidents at current levels. This issue requires clarification by the NRC.

Concern: HHI.029 **Comment:** 087.098 **Subtopic:** Radiation exposure-public/worker
Commenter: Sanderson **Page:** 3-23 **Org:** U.S. Environmental Protection Agency

Section 5.2.1.4 of the GEIS states that based on information compiled by the United Nation's Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the National Academy of Sciences, and the International Commission on Radiological Protection (ICRP), the risk estimates for fatal cancers range from 0 to 500 per million person-rem. This is incorrect. The 90 percent confidence limits given in BEIR V are 500 to 1,200 additional fatal cancers per 100,000 people for exposure to 10 rem, with risk coefficients possibly a factor of two lower for exposure at low doses and dose rates.

Concern: HHI.034 **Comment:** 087.099 **Subtopic:** Public exposure
Commenter: Sanderson **Page:** 3-23 **Org:** U.S. Environmental Protection Agency

On page 5-3, line 7, it is stated that the principal radiological hazard associated with the accidental release of radioiodines is from ingestion. Inhalation is of greater concern than ingestion, as is external whole body exposure.

Concern: POA.004 **Comment:** 087.100 **Subtopic:** Categorization
Commenter: Sanderson **Page:** 3-23 **Org:** U.S. Environmental Protection Agency

Section 5.3.3.3, page 5-39; page 10-24
Section 5.5.3, page 5-113

Same as Comments 087.096 and 087.097 (as they apply to fallout onto open bodies).

Concern: POA.019 **Comment:** 087.101 **Subtopic:** Water runoff
Commenter: Sanderson **Page:** 3-23 **Org:** U.S. Environmental Protection Agency

On page 5-44, line 24, it is stated that runoff is not addressed in the analysis of impacts. The GEIS should demonstrate that runoff is not a significant contributor to risk as compared to direct deposition on the water.

Concern: POA.003 **Comment:** 087.102 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 3-24 **Org:** U.S. Environmental Protection Agency

The EPA questioned whether sedimentation processes are accounted for in the residence times (see Table 5.14b, p. 5-52), and if not, could such processes affect the results of the analyses.

Concern: POA.018 **Comment:** 087.103 **Subtopic:** Bioaccumulation
Commenter: Sanderson **Page:** 3-24 **Org:** U.S. Environmental Protection Agency

On the bottom of page 5-56, reference is made to the doses associated with the ingestion of aquatic organisms. The EPA assumes that the NRC used the bioaccumulation factor approach to calculate the doses. If so, it questions whether that approach can be reliably used under conditions where the activity in the water and sediment are undergoing rapid change.

Concern: POA.004 **Comment:** 087.104 **Subtopic:** Categorization
Commenter: Sanderson **Page:** 3-24 **Org:** U.S. Environmental Protection Agency

Section 5.3.3.4, page 5-60; page 10-24
Section 5.5.4, page 5-113

Same as Comments 087.096 and 087.097 (as they apply to atmospheric releases).

Concern: POA.004 **Comment:** 087.105 **Subtopic:** Categorization
Commenter: Sanderson **Page:** 3-24 **Org:** U.S. Environmental Protection Agency

Section 5.3.4, page 5-90; page 10-24
Section 5.5.5, page 5-113

Same as Comments 087.096 and 087.097 (as they apply to assessment of economic impacts).

Concern: POA.017 **Comment:** 087.106 **Subtopic:** Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 3-25 **Org:** U.S. Environmental Protection Agency

The GEIS uses the EI concept to normalize economic impacts. However, the EI concept uses

only a met-sector-weighted-population, which is appropriate for assessing public health impacts but not for economic impacts. The primary economic impact is the contamination of farm land. As a result, weighing by population is not appropriate.

Concern: DEC.002 **Comment:** 087.107 **Subtopic:** Non-radiological decommissioning
Commenter: Sanderson **Page:** 3-25 **Org:** U.S. Environmental Protection Agency

Section 7.3.1, page 7-19; page 10-26
Section 7.4, page 7-28

The total impacts associated with returning the site to greenfield conditions need to be addressed (See p. 7-1 of GEIS).

Concern: DEC.014 **Comment:** 087.108 **Subtopic:** Environmental impact
Commenter: Sanderson **Page:** 3-25 **Org:** U.S. Environmental Protection Agency

Due to the lack of a residual radioactivity rule, there is some question whether the generic impacts provided in NUREG-0586, especially costs, are subject to change once the NRC or the EPA issues such a rule. This matter should be discussed in the GEIS.

Concern: DEC.009 **Comment:** 087.109 **Subtopic:** D&D rule
Commenter: Sanderson **Page:** 3-25 **Org:** U.S. Environmental Protection Agency

The D&D impacts presented in Chapter 7 of the GEIS are based on NUREG-0586, which is the EIS in support of the D&D rulemaking. NUREG-0586 generically characterizes D&D impacts in a realistic manner to support a rulemaking. The EPA believes each D&D operation will be supported by a site-specific EIS addressing all issues. Accordingly, the D&D rulemaking was not designed to bound impacts. Therefore, it is questionable whether NUREG-0586 can be used to categorically exclude the impacts, unless it is demonstrated in the GEIS that NUREG-0586 bounds the impacts for all plants.

Concern: DEC.011 **Comment:** 087.110 **Subtopic:** Radiation dose
Commenter: Sanderson **Page:** 3-25 **Org:** U.S. Environmental Protection Agency

The statement on page 7-17 that ". . . atmospheric release for decommissioning are less than 100 mCi, whereas normal operations average about 3,000 Ci/yr" is somewhat misleading since the releases from normal operations are relatively short-lived noble gases while D&D emissions are longer-lived particulate radionuclides that have much higher dose conversion factors.

Concern: DEC.010 **Comment:** 087.111 **Subtopic:** Waste management
Commenter: Sanderson **Page:** 3-26 **Org:** U.S. Environmental Protection Agency

At the top of page 7-4, the GEIS states that because the PWR turbines are not part of the primary

loop, they normally are not contaminated. However, primary-to-secondary leakage is a normal and expected part of plant operations. Accordingly, the turbines will be slightly contaminated at the end of plant life.

Concern: SWM.004 **Comment:** 087.112 **Subtopic:** LLW disposal
Commenter: Sanderson **Page:** 3-26 **Org:** U.S. Environmental Protection Agency

Section 7.3.2, page 7-22; page 10-26; Section 7.4, page 7-28

Because of the potentially increased levels or quantities of LLW and the uncertainty associated with developing new LLW disposal facilities, this issue should be classified as Category 2. Facilities in compact areas that have either not developed LLW disposal facilities or where disposal capacity is uncertain should prepare supplemental environmental documentation.

Concern: DEC.007 **Comment:** 087.113 **Subtopic:** Waste management
Commenter: Sanderson **Page:** 3-26 **Org:** U.S. Environmental Protection Agency

At the top of page 7-13, the GEIS states that activated metal cannot be decontaminated. Melt-refining and electro-refining can be used to decontaminate and recycle activated metals. If such processes are found to be cost effective, the costs and impacts of decommissioning could be sharply reduced, especially since waste disposal costs are a major contributor to D&D costs (see Table 7.10 on p. 7-26).

Concern: NGC.004 **Comment:** 087.114 **Subtopic:** State participation
Commenter: Sanderson **Page:** 3-26 **Org:** U.S. Environmental Protection Agency

Section 8, page 8-1; page 10-4

Even if it can be concluded that generating capacity is needed, the conclusion that license renewal is needed is premature. In an EIS process, the need for the project is questioned in two parts. In this case, the first question is whether generating capacity is needed. The second question, which is essentially the subject of the entire EIS, is whether the proposed action (license renewal) is the "best" alternative for meeting the need. Since the GEIS has not resolved all of the impact issues (i.e., there are Category 2 and 3 issues), an affirmative answer to the latter question cannot yet be established, and therefore it cannot be generically concluded that there is a need for generating capacity via license renewal. This issue should be reworded to state simply "need for generating capacity." As for the Pacific 1 Region, since need for generating capacity is not well supported by the data presented in Appendix H, perhaps the need for capacity issue should be classified as Category 2 and subject to review in the EAs of plants in the Pacific 1 region. Regardless of conclusions in the GEIS, an examination of need by the State utility regulatory authority will take place nearer the time of license renewal. Therefore, a generic conclusion at this time does not have the benefit of avoiding the effort of examining need in the future. Inclusion in Appendix H of additional information from the referenced studies, such as the SAND NUPLEX study, would help to substantiate the conclusions and ensure reviewers of an opportunity to examine more of the underlying assumptions. Recent reports indicate that EPRI predictions for demand have been

over-estimated because they underestimated the effects of conservation and increased use of more energy efficient appliances and equipment. Given that a license renewal will cover a 20-year period, there needs to be flexibility in the process to allow for consideration of technologies which are currently infeasible or as yet unknown and of regional differences in need based on alternative energy sources. The process also needs to provide for public review and comment on the purpose and need for continuing a project.

Concern: NGC.013 **Comment:** 087.115 **Subtopic:** Determination of need
Commenter: Sanderson **Page:** 3-27 **Org:** U.S. Environmental Protection Agency

Section 2.1, page 2-1; page 10-5

The EPA does not see the relevance of the direct economic benefit of generating capacity for a NEPA review process. The need for capacity, already addressed as the issue above, sets the premise for the remainder of the EIS: what are the impacts of the alternative means to meet the need (and of the no action alternative). It means little to say that the relicensing alternative has the benefit of meeting this need; the other alternatives are also selected to meet this need and therefore should also have this benefit.

Concern: NGC.013 **Comment:** 087.116 **Subtopic:** Determination of need
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

Section 2.1, page 2-1; page 10-5

Same as Comment 087.115.

Concern: ALT.001 **Comment:** 087.117 **Subtopic:** Categorization of issues
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

Chapter 9, page 9-1; page 10-4

If the conclusion that license renewal is the best alternative holds for plants that meet economic thresholds, then this issue falls under the definition of Category 2.

Concern: ALT.011 **Comment:** 087.117a **Subtopic:** Comparison of alternatives
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

If geothermal is potentially competitive in certain areas, then Chapter 9 should have included these sources in its comparison of environmental impacts, which was limited to fossil fuel and nuclear power plants.

Concern: ALT.011 **Comment:** 087.117b **Subtopic:** Comparison of alternatives
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

A discussion is needed of the radiation doses associated with routine atmospheric emissions of naturally occurring radionuclides in the fly ash of coal plants. Studies have shown that these doses are comparable to the doses from the routing radiological emissions from nuclear power plants (see the UNSCEAR reports).

Concern: ALT.001 **Comment:** 087.117c **Subtopic:** Categorization of issues
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

Given the timeframe over which a license renewal could apply and the fact that it is difficult to predict what technological advances may be available and how those advances could affect a regional need, the process should provide for evaluating alternatives as a part of a site-specific document.

Concern: ALT.004 **Comment:** 087.118 **Subtopic:** Economic analysis
Commenter: Sanderson **Page:** 3-28 **Org:** U.S. Environmental Protection Agency

Section 9.4.5, page 9-38; page 10-5
Section 9.5, page 9-41; and Appendix H

The threshold values given in Appendix H are based on an economic comparison with coal-fired plants. Are thresholds derived from such a comparison also appropriate in areas of the western U.S. where geothermal energy is said to be a potential alternative to nuclear plant license renewal?

Concern: SWM.043 **Comment:** 087.119 **Subtopic:** LLW disposal-costs
Commenter: Sanderson **Page:** 3-29 **Org:** U.S. Environmental Protection Agency

Section 9.4.5.4, page 9-40; page 10-6
Section 9.5, page 9-41

The EPA asked about the assumed costs of LLW disposal and whether these assumptions were conservative.

Concern: GIS.012 **Comment:** 087.120 **Subtopic:** Cost-benefit analysis
Commenter: Sanderson **Page:** 3-29 **Org:** U.S. Environmental Protection Agency

It seems redundant to present both the avoided cost-benefit and the three direct costs associated with relicensing since avoided cost incorporates the direct costs in order to compare them to costs of the coal-fired power alternative.

Concern: REG.005 **Comment:** 087.121 **Subtopic:** NUREG-1440-Regulatory impact assessment (RIA)
Commenter: Sanderson **Page:** 4-1 **Org:** U.S. Environmental Protection Agency

Two overall shortcomings are evident in the regulatory impact analyses (RIA) (NUREG-1440). One shortcoming is that no serious effort has been made to address whether or not both alternatives actually provide the same benefits of full and open public participation in the process and, if so, the significance of front loading the costs of participation on intervenors. Indeed, the Executive Order mandating preparation of RIAs calls for a "description of potential costs, including any adverse effects that cannot be quantified in monetary terms . . . ." A second weakness is that the analysis of costs misses the key issue, namely, whether the higher development costs of Alternative B are offset by the magnitude of the future savings.

Concern: REG.004 **Comment:** 087.122 **Subtopic:** NUREG-1440-Cost/benefits analysis
Commenter: Sanderson **Page:** 4-1 **Org:** U.S. Environmental Protection Agency

The discussion asserting the identity of the benefits under the two alternatives is not fully compelling. The key issue is not really whether the impacts will be identical under the two alternatives. Rather, it is whether or not the certainty that the impacts are within acceptable limits will be identical under both alternatives. The RIA analysis alludes to this issue in its brief discussion of the costs that interested parties will incur to participate in the process. For groups opposed to the extension of licenses, the generic treatment of a range of impacts may cause them not only to expend considerable resources at the beginning of the process (which might well be more of a burden than committing even greater resources over a longer period of time), but also to feel that the purpose of the GEIS was to exclude them from full participation in the process. Additional consideration and discussion of this issue appears to be warranted.

Concern: REG.003 **Comment:** 087.123 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-1 **Org:** U.S. Environmental Protection Agency

The labor rate of $47.90 for the NRC is not valid. The implementation of "Full Cost Recovery", as mandated by the Congress, has resulted in a 1991 cost of $115/hr. Moreover, these "NRC costs" will now be billed directly to licensees. The RIA should reflect this change, both in the labor rate assigned to the NRC and the headings of the cost elements. Suggested changes would be:
Industry Costs = Industry Analysis and Submission Costs
NRC Costs = Costs for the NRC to Review and Approve Documents.

Concern: REG.001 **Comment:** 087.124 **Subtopic:** NUREG-1440-Analysis-approach, assumptions, and data
Commenter: Sanderson **Page:** 4-1 **Org:** U.S. Environmental Protection Agency

The assumption used on the rate of license renewal applications, i.e., 12 years prior to operating license expiration, is reasonable. The intermediate scenarios assuming 25 and 50 percent renewal rates are also reasonable to bound the analysis. However, the sensitivity analysis could explicitly

consider the importance of timing, particularly with respect to the partial renewal scenarios, rather than simply relying on the assertion that this is not important (see p. 11). The 25 percent renewal scenario with only the 29 most recently licensed plants seeking renewal provides the bounding case. Evaluation of this scenario shows that Alternative B is less expensive than Alternative A at discount rates of 0 and 5 percent, but more expensive at a 10 percent discount rate. If coupled with the upper bound estimate of the effort involved in report preparation and review, this low/late participation scenario might not be cost-effective at even low discount rates.

Concern: REG.003 **Comment:** 087.125 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-2 **Org:** U.S. Environmental Protection Agency

In Table 1, the NRC Costs and Total Costs should be corrected to reflect the NRC labor rate of $115.

Concern: REG.003 **Comment:** 087.126 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-2 **Org:** U.S. Environmental Protection Agency

The per plant cost estimates for Alternative B do not reflect the discussion in the text. In Section 4.3.1, the Average Plant Cost (undiscounted) is given as $134,000. However, based on the data provided, the cost is $111,700 per plant.

For NRC costs the calculation is analogous except that the hours/issue and $/hour are 3,000/97 = 31 and $115, respectively. Thus, the NRC cost per plant is $78,400.

Concern: REG.003 **Comment:** 087.127 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-3 **Org:** U.S. Environmental Protection Agency

Table 2 costs should be corrected to reflect the accurate costing of NRC labor hours at $115/hr, and the correct per plant costs developed above for Alternative B.

Concern: REG.003 **Comment:** 087.128 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-3 **Org:** U.S. Environmental Protection Agency

Table 3 and all subsequent tables must be revised to reflect the corrections to the NRC labor rate or the costs of per plant submissions.

Concern: REG.003 **Comment:** 087.129 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-3 **Org:** U.S. Environmental Protection Agency

Including the appropriate development costs and properly computing the industry and NRC costs, the data for the summary table should be corrected. (See page 3 of EPA Enclosure 4 for detailed figures).

Concern: REG.003 **Comment:** 087.130 **Subtopic:** NUREG-1440-Cost estimates
Commenter: Sanderson **Page:** 4-3 **Org:** U.S. Environmental Protection Agency

The costs of Alternative B do not appear to include the costs of "periodic review" of GEIS findings, which the NRC has stated an intention of conducting.

Concern: REG.004 **Comment:** 087.131 **Subtopic:** NUREG-1440-Cost/benefits analysis
Commenter: Sanderson **Page:** 4-4 **Org:** U.S. Environmental Protection Agency

In the RIA, Section 4.5.1 on Regulatory Development Costs, the relegation of the regulatory development costs to the sensitivity analysis is inappropriate. Granting that the benefits of the two alternatives are identical, and granting that the per plant costs of report preparation and review is lower for Alternative B than for Alternative A, the only issue is the comparison of the present worth of the expenditures over time for Alternative A (higher per plant costs and lesser development costs) with Alternative B (less per plant costs with higher development costs). Stated in simple terms, the issue is whether it is worthwhile to spend additional dollars now to reduce the future costs of environmental document preparation and review. The characterization of the NRC development costs for Alternative B as "sunk costs", is misleading. Given that the real issue (see comment 9) is whether or not it is advantageous to spend X million dollars today to avoid incurring some fraction of Y dollars per year over the next 30 years, it is inappropriate to characterize the X million dollars in development costs as sunk costs and ignore them in the main cost analysis.

Docket Number: 088

Concern: ALT.030 **Comment:** 088.001 **Subtopic:** Analysis of alternatives/ Conservation
Commenter: Ernst **Page:** 1 **Org:** Cape Cod Commission

A local planning commission declares as unacceptable the NRC's assumption that relicensing is necessary to meet the energy capacity requirements of service areas because it neither allows consideration of viable alternative energy sources being developed, such as wind, solar, photovoltaic cells, hydropower, biomass, and solar thermal power, nor considers the possibility that conservation may reduce energy needs.

Concern: NEP.007 **Comment:** 088.002 **Subtopic:** Cumulative impacts
Commenter: Ernst **Page:** 1 **Org:** Cape Cod Commission

A local planning commission notes that the proposed GEIS approach to relicensing nuclear power plants assumes that 80 out of 104 potential impacts will have no effect in the future and therefore do not need to be considered. The commission questions this assumption, especially since the cumulative effects of some impacts could be large and therefore should still be evaluated.

Concern: SWM.020 **Comment:** 088.003 **Subtopic:** Radioactive waste disposal/land use
Commenter: Ernst **Page:** 1 **Org:** Cape Cod Commission

A local planning commission notes that the NRC believes that the potential land use changes involved in relicensing would be small compared to current site use and, therefore, considered such changes as Category 1 impacts. However, since there still is no permanent method for HLW disposal, onsite storage of these wastes would still occur. The commission believes this impact should be heavily considered during the relicensing phase.

Concern: POA.013 **Comment:** 088.004 **Subtopic:** Plant aging
Commenter: Ernst **Page:** 1 **Org:** Cape Cod Commission

A local planning commission is concerned because many of the items deemed "not to be a problem" are so designated based on the performance of existing nuclear power plants, very few of which are older. The blanket statement of no environmental impacts from postulated accidents is naive at best. Likewise the statement that there is a small cost for postulated accidents in plants which will be in excess of 30–40 years old is fallacious. Older plants, such as Rowe which could not continue to be operated safely and cost effectively, have shown why the GEIS approach is not appropriate. A GEIS approach to relicensing Rowe would not even have considered the safety and physical plant integrity issues which were the very ones which permanently closed the facility.

Docket Number: 089

Concern: NONE **Comment:** 089.001 **Subtopic:** References Docket 63
Commenter: Creel **Page:** 1 **Org:** Baltimore Gas and Electric

An electric utility company fully endorses the comments submitted by NUMARC (Docket 63) and encourages the NRC to incorporate those comments in the final rule.

Concern: NONE **Comment:** 089.002 **Subtopic:** Supportive statement
Commenter: Creel **Page:** 1 **Org:** Baltimore Gas and Electric

An electric utility company supports the NRC's proposed generic rulemaking approach and believes it adequately protects the environment by properly assessing the environmental impacts of license renewal. It also believes it will result in better use of both NRC and industry resources.

Concern: NEP.005	**Comment:** 090.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Savela	**Page:** 1	**Org:** Minnesota Public Interest Research Group

A public interest group believes that the new rules are clearly an attempt by the NRC to reduce the amount of public participation in the license renewal process, and contends that in a decision of such great importance to the future energy policy of Minnesota, as well as the nation, the GEIS as it stands is unacceptable. (See also 090.031, which is similar.)

Concern: SWM.009	**Comment:** 090.002	**Subtopic:** Spent fuel
Commenter: Savela	**Page:** 3	**Org:** Minnesota Public Interest Research Group

A public interest group believes the issue of spent fuel solid waste disposal should not be designated as Category 1; rather each plant should be required to submit a concrete plan laying forth its solution for spent fuel storage. The plan should include projected costs associated with construction and operation of additional storage, as well as environmental and safety study results. Additionally, the NRC should realize that a Federal repository may never be constructed and start planning accordingly. (This is basically the same comment as 090.007.)

Concern: NGC.004	**Comment:** 090.003	**Subtopic:** State participation
Commenter: Savela	**Page:** 3	**Org:** Minnesota Public Interest Research Group

A public interest group disagrees with the GEIS categorization of need for generating capacity. It believes that the need for generating capacity will differ from region to region, as will the solutions; therefore, a generic conclusion cannot be reached on this issue. Additionally, forecasting by nature is too imprecise to justify this conclusion.

Concern: ALT.033	**Comment:** 090.004	**Subtopic:** Analysis of alternatives
Commenter: Savela	**Page:** 3, 4	**Org:** Minnesota Public Interest Research Group

Although a public interest group cites a table in the GEIS, in Vol. 1, Chapter 9, which suggests that 270 percent of the energy provided by nuclear power could be replaced by a combination of wind, solar photovoltaics, biomass, hydropower, and natural gas, it concludes that the GEIS approach is flawed in that it did not consider the aggregate contribution of renewable energy sources to replace nuclear power. The GEIS also fails to adequately assess the possible technological advances in renewable energy technologies over the next 40 years. Furthermore, the combinations of alternative energy sources to replace nuclear power will vary from region to region. Therefore, the issue of alternatives to license renewal cannot be considered generically.

Each plant, when applying for license renewal, should be required to do a complete study of cost-effective combinations of alternatives to license renewal, including environmental costs, fuel, O&M, storage, and decommissioning.

Concern: NGC.004	**Comment:** 090.005	**Subtopic:** State participation
Commenter: Savela	**Page:** 5–6	**Org:** Minnesota Public Interest Research Group

A public interest group believes that the proposed rules encroach upon the States' right to regulate the nonradiological aspects of nuclear power, in effect precluding the States and the public from determining whether relicensing makes sense from a cost-benefit perspective. The group noted that while the Supreme Court has not created a clear test for preemption cases, it has developed rules for different categories of cases, such as police power regulations, which "require a clear and manifest purpose of Congress" before they are found to be preempted (*Rice v. Santa Fe Elevator Corp.*).

The public interest group also cited the Supreme Court's decision in *Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Commission*, which upheld States' rights to regulate the nonradiological aspects of commercial nuclear power. In this case, the Court concluded that California's moratorium on the construction of nuclear power plants was based on considerations such as the lack of a long-term disposal option. The group noted that under the NRC proposed rules, an analysis of this issue (a nonradiological one) would not be allowed. The group believes that States must be allowed to assess the nonradiological aspects of relicensing on a site-specific basis under the AEA and the Supreme Court's interpretation of it.

Concern: SWM.009	**Comment:** 090.006	**Subtopic:** Spent fuel
Commenter: Savela	**Page:** 6–7	**Org:** Minnesota Public Interest Research Group

A public interest group noted that although the NRC, in the GEIS, Vol. 1, page 6-36, admits that onsite storage of HLW "could be 50 percent greater than at the end of 40-year licenses if a permanent repository or MRS does not become available," the NRC also boldly concludes that increased onsite pool and dry cask storage would have no significant environmental impact. The group called the NRC's conclusions unsubstantiated because the dry cask storage technology is in its infancy and data on the performance and environmental impacts of the technology is virtually nonexistent. (See also SWM.033 and SWM.028.)

Concern: SWM.009	**Comment:** 090.007	**Subtopic:** Spent fuel
Commenter: Savela	**Page:** 7–8	**Org:** Minnesota Public Interest Research Group

A public interest group commented that the local environmental impacts of indefinite onsite storage cannot be determined generically. While the GEIS presumes that a permanent repository or MRS will be constructed, it is far from certain when even the first repository will be successfully selected, much less constructed and put into operation. The group observed that the

costs incurred by the States for storing HLW onsite will vary dramatically, depending upon the availability of Federal storage. Each State must, therefore, be able to analyze the future costs of storing this waste. (See also SWM.046.)

Concern: SWM.009 **Comment:** 090.008 **Subtopic:** Spent fuel
Commenter: Savela **Page:** 9–10 **Org:** Minnesota Public Interest Research Group

A public interest group commented that a compelling factor that demonstrates that a generic assessment of the impact of waste storage is inappropriate is that considerable scientific uncertainty surrounds the permanent disposal of HLW in a deep geologic repository.

Concern: NGC.004 **Comment:** 090.009 **Subtopic:** State participation
Commenter: Savela **Page:** 12 **Org:** Minnesota Public Interest Research Group

A public interest group believes that the GEIS use of Category 1 for need for generating capacity is unwise and unjustified because:

1. The nature of forecasting itself is too imprecise to justify it.
2. A Category 1 classification would prevent future evaluation of changing generating capacity.
3. It is unwise to be locked into a policy without flexibility for change if developments 5, 10, or 20 years hence do not support the policy.

Concern: NGC.004 **Comment:** 090.010 **Subtopic:** State participation
Commenter: Savela **Page:** 12–13 **Org:** Minnesota Public Interest Research Group

A public interest group believes that a Category 1 classification is unjustified because forecasting, while it has its usefulness, also has some well understood limits, uncertainties, and assumptions. Category 1 implies that electrical generation requirements 40 years into the future can be predicted now.

Concern: NGC.004 **Comment:** 090.011 **Subtopic:** State participation
Commenter: Savela **Page:** 13 **Org:** Minnesota Public Interest Research Group

A public interest group commented that forecasting is subject to an important methodological limit: the results are only as good as the assumptions in capturing what will really happen x years into the future. Trends are based on what has happened in the past without a rule for the unexpected; if unexpected events occur, the forecast is inaccurate. A good forecast, such as that

provided in the *Northwest Conservation and Electric Power Plan*, must include several scenarios and examine what must be done to make them happen.

Concern: NGC.004	**Comment:** 090.012	**Subtopic:** State participation
Commenter: Savela	**Page:** 13	**Org:** Minnesota Public Interest Research Group

A public interest group commented that forecasts are useful, but it is unwise and unjustified to fix them and their assumptions in rules, such as a Category 1 classification, because this locks in a future that may not happen and prevents the adjustment of policy to fit new conditions. Category 1 connotes surety about the future; however, forecasting is purely speculative.

Concern: NGC.004	**Comment:** 090.013	**Subtopic:** State participation
Commenter: Savela	**Page:** 12–13	**Org:** Minnesota Public Interest Research Group

A public interest group made the following comments on specific aspects of the NRC forecasts:

1. NRC staff derived a consensus of electricity generating forecasts from nine national ones in the hope that this would capture the known uncertainties about the future. However, this has not occurred (see GEIS, Vol. 2, Appendix H.6). One example of the uncertainty within 10-year forecasts is the NERC annual forecasts. Between 1973 and 1983, the NERC forecasts were lowered each year, with important consequences for the high financial investments premised on these projections. Another example of this uncertainty is the EIA annual 10-year forecasts. In 1982, the EIA projected that 592,541 MW would be peak summer load for major utility systems in the U.S. The actual 1991 summer peak load was less than that estimate. These forecasts, useful though they may be, are so limited that they cannot justify a GEIS Category 1 classification. They also have no role for unpredictable events such as spiraling interest rates, oil embargoes, or wars.

2. The GEIS sampling is narrow: it does not include forecasts done by State regulatory commissions.

3. The GEIS base case forecast and the "high conservation" case forecast seriously underestimate the potential for conservation and reduction in electricity generation requirements.

When these limitations are considered, it is clear that the Category 1 classification is unjustified and unwise.

Concern: ALT.016	**Comment:** 090.014	**Subtopic:** Demand side management
Commenter: Savela	**Page:** 15	**Org:** Minnesota Public Interest Research Group

A public interest group commented that the GEIS allows that the base case and the high-

conservation case could reduce electricity generation needs 3.8 percent and 8.4 percent, respectively, by 2010. In contrast, a recent EPRI study concludes that 24 to 44 percent can be saved, and a Rocky Mountain Institute (RMI) study says 75 percent can be saved on electricity generation. As EPRI and RMI representatives at a recent discussion on conservation potential emphasized, "the differences between these estimates are less important than their agreement that substantial amounts of electricity can be saved in a cost-effective manner." (See also NGC.007.)

Concern: ALT.016 **Comment:** 090.015 **Subtopic:** Demand side management
Commenter: Savela **Page:** 15–17 **Org:** Minnesota Public Interest Research Group

A public interest group commented that the GEIS regional forecasts lack specific data regarding State-level forecasts (GEIS, Vol. 1, Tables 8.2–8.9). They also do not reflect the higher achievement levels and projected potentials accompanying recent State implementation of aggressive conservation programs. Some examples of recent State conservation projections and programs include the following:

1. A 1989 New York State energy forecast predicts an electricity demand growth of 1.6 percent to 2.1 percent per year between 1988 and 2008. According to some analysts, this implies that electricity demand will increase 26,000 GWh/year between 1988 and 2000. Furthermore, very little of the savings potential in existing buildings and equipment is incorporated into the State's forecast.

2. A recent General Accounting Office (GAO) study, GAO/RCED-92-13, on DSM notes that in Massachusetts, California, and the Pacific Northwest States, DSM programs can satisfy over one-half of new electricity demand.

3. A study done for the Minnesota Department of Public Service in 1988 shows that a potential 52 percent savings through aggressive conservation exists in Minnesota. Also in Minnesota, in the recent certificate of need hearings on dry cask storage at Northern States Power's (NSP's) Prairie Island (PI) nuclear facility, testimony showed that aggressive implementation by NSP of efficiency improvements in commercial and industrial lighting and motors alone could almost displace the PI electricity output. Further, an NSP witness allowed that utilities in the U.S. and Canada are pursuing conservation programs which will replace percentages of their systems requirements comparable to PI's contribution to NSP's system. These savings are magnified when used in combination with other generating options, such as renewable energy resources. Further, NSP allowed that at least 8,000 GWh of conservation potential existed in its service territory. One witness testified that the technical conservation potential that is cost effective from the consumer's perspective is greater than the PI output and capacity several times over.

4. Some utilities are testing Amory Lovins' view that if maximum use were made of energy efficient technologies in U.S. homes and businesses, no new baseload generating plants would be needed.

Concern: NGC.004 **Comment:** 090.016 **Subtopic:** State participation
Commenter: Savela **Page:** 17–18 **Org:** Minnesota Public Interest Research Group

A public interest group believes that a Category 1 classification precludes consideration, in license renewal applications, of the unpredictable effects of regulatory and legislative actions, and technological developments on electricity generation savings. These factors already are influencing electricity generation requirements and saving more than was envisioned 5 to 10 years ago. Environmental challenges spurned 10 years ago are now spurring legislatures into action to reduce energy use. State efforts to incorporate external environmental costs into the price of electricity generation will influence the selection of electricity generation sources as States push for stronger integrated resource planning and least-cost planning. The CAA amendments have also significantly boosted conservation efforts. Congressional deregulation of the utility industry for FERC rulemaking on PUCHA will also affect electricity generation.

Concern: ALT.019 **Comment:** 090.017 **Subtopic:** Cogeneration
Commenter: Savela **Page:** 18 **Org:** Minnesota Public Interest Research Group

A public interest group commented that nonutility generation, much of which is from cogenerators, should be broken out in the GEIS (Vol. 1, p. 8-10). State legislatures are pushing for more nonutility generation, and estimates for its contribution to reduction of electricity generation requirements will change and vary from region to region. Because it is uncertain how big this contribution will be 10, 20, or 30 years from now, it is unwise to lock it in at speculative levels set by a Category 1 classification based on 1989/1990 projections.

Concern: NGC.004 **Comment:** 090.018 **Subtopic:** State participation
Commenter: Savela **Page:** 18–19 **Org:** Minnesota Public Interest Research Group

A public interest group commented that technological developments have had a great impact on the electricity industry and are creating great achievements in conservation (see Richard F. Hirsch, *Technology and Transformation in the Electrical Utility Industry*, Cambridge, 1989). About 1,000 technologies (instead of just 50) are available and documented in *Competitek* reports, used by some 180 utilities, government, and other agencies in over 30 countries. For example, there are about eight things you can do to domestic water heating to save two-thirds of that load. By this disaggregation you find a lot of small terms that collectively are important because there are so many (see GAO/RCED 91-66, *Meeting the Energy Challenges of the 1990's*, p. 42).

Concern: NGC.008 **Comment:** 090.019 **Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Savela **Page:** 19–20 **Org:** Minnesota Public Interest Research Group

A public interest group made the following comments on capacity factors and plant aging. In

calculating the potential generating capacity from nuclear plants with renewed licenses, the GEIS assumes the utilization factor for nuclear plants will be about 62 percent before license renewal (GEIS, Vol. 1, p. 8-10). However, in Table 8.9, this capacity factor is dropped to 60 percent for license renewal. The group emphasized that capacity declines as plants age and no scientific basis exists to assert that this will reverse in the license renewal period. Furthermore, no evidence exists to show that capacity will hold steady at 60 percent during the license renewal stage. On the contrary, studies documented on both U.S. and Canadian reactors show that nuclear plant performance declines due to age-related degradation as measured by reduced capacity factors. The Public Citizen's 1989 publication *On Again Off Again The Unreliability of U.S. Nuclear Power Plants* and the well-known Komanoff (KEA) studies also illustrate the trend of performance decline in U.S. nuclear plants.

The public interest group concludes that the NRC assumption that nuclear power plants will continue to provide power at 1990 levels for another 40 years is clearly optimistic speculation which could cause capacity shortfalls. The MPIRG believes that capacity shortfalls will result from reduced availability, unplanned events (such as prolonged or permanent plant shutdown), and continued public opposition to plant operations without solutions to permanent HLW storage.

Concern: NGC.008	**Comment:** 090.020	**Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Savela	**Page:** 12–13	**Org:** Minnesota Public Interest Research Group

A public interest group commented that the GEIS assumption that all 118 nuclear plants will contribute electrical generating capacity has been compromised by recent events, such as the upcoming decommissioning of Shoreham and shutting down of Yankee Rowe because of escalating costs. It pointed out that other plant shutdowns are possible and would further reduce the electrical generating capacity potential of license renewal.

Concern: NGC.008	**Comment:** 090.021	**Subtopic:** Analysis-approach, assumptions, and data/Categorization
Commenter: Savela	**Page:** 21	**Org:** Minnesota Public Interest Research Group

A public interest group commented that declining capacity factors, reduced reliability, and reduced total generating capacity of aging nuclear plants require that "Need for Generating Capacity" not be a Category 1 issue.

Concern: NEP.005	**Comment:** 090.022	**Subtopic:** Public participation/site-specific EISs
Commenter: Savela	**Page:** 21	**Org:** Minnesota Public Interest Research Group

A public interest group commented that each license renewal will bring public discussion of the issues of declining capacity factors, reduced reliability, and reduced total generating capacity of

aging nuclear plants. The NRC should not be seen by the public as trying to administratively cut off public input by such an obviously inadequate Category 1 classification.

Concern: ALT.030	**Comment:** 090.023	**Subtopic:** Analysis of alternatives/ Conservation
Commenter: Savela	**Page:** 21–22	**Org:** Minnesota Public Interest Research Group

A public interest group noted that while some people argue that conservation, efficiency, and renewables will not be available in time to replace electrical generating capacity from nuclear power plant license renewal, the fact is that nuclear power plant licenses will not expire all at once, but in a staggered fashion. In 2005, only 1 x 10^9 kWh will need replacement; in 2010 only 13 x 10^9 kWh. Only after 2010 will the figure climb at an accelerated pace. By 2010, the electrical generation picture of the U.S. will be different from 1989/90 when the GEIS forecasts were made. The staggered expiration pattern of nuclear plants means that conservation, efficiency, and renewables need not be available at once in 2010 to replace the 108 GW x 60 percent capacity factor = 64.8 GW now generated by nuclear power plants. Thus, a Category 1 classification is unjustified and would unwisely lock in electrical energy policy that may need changing 20 years from now.

Concern: ALT.033	**Comment:** 090.024	**Subtopic:** Analysis of alternatives
Commenter: Savela	**Page:** 22–23	**Org:** Minnesota Public Interest Research Group

Regarding the potential of renewable energy, A public interest group commented that the GEIS fails to give any credence to the possibility that the U.S. might not need nuclear power at all in the future. The U.S. with its wealth of technology has the opportunity to become a world leader in clean, renewable energy generation. A new study, *America's Energy Choices: Investing in a Strong Economy and a Clean Environment*, projects that if aggressive policies emphasizing energy efficiency and clean, renewable energy technologies were adopted, the following would be achieved:

1. Cut our projected national energy requirements in half by 2030, with renewable energy contributing more than 50 percent of the energy supply.

2. Save consumers and industry $5 trillion in fuel and electricity bills over the next 40 years, while costing about $2.7 trillion for new technology investments, for a net savings of $2.3 trillion.

3. Lower carbon dioxide emissions more than 25 percent from 1988 levels by 2005, and more than 70 percent by 2030.

Concern: NRR.008 **Comment:** 090.025 **Subtopic:** Analysis of alternatives
Commenter: Savela **Page:** 23 **Org:** Minnesota Public Interest Research Group

A public interest group noted that the *1991 Northwest Conservation and Electric Power Plan, Vol. 1*, has an "action plan", which calls for action in four different areas to achieve electric demand using renewable energies:

1. Start now to buy all the low-cost resources available. Since resources take time to develop, it is likely that low-cost ones will be needed in the coming decade.

2. Shorten the time it takes to acquire and fully develop a resource to the point where it is producing electricity. This shortened lead time improves the region's ability to respond quickly to growth or to changing patterns of energy use.

3. Promote diversity in future plans by conforming the cost and availability of additional resources in order to get reliable information about alternative resources.

4. Focus on regulatory, legislative, and environmental actions that provide incentives for, and remove barriers to, the successful implementation of the plan.

Concern: ALT.030 **Comment:** 090.026 **Subtopic:** Analysis of alternatives/ Conservation
Commenter: Savela **Page:** 23–24 **Org:** Minnesota Public Interest Research Group

A public interest group commented that the NRC's assessment of the possibilities that renewable energy resources have to offer in replacing retired nuclear plants is overly pessimistic. Volume 1 of the GEIS shows that a combination of renewables could provide much more energy than would be lost through expired licenses. Graphs 1 and 2 show a cumulative effect of the loss of nuclear power plants and the corresponding amount of energy produced by renewables for a period of 30 years. As is apparent from the graphs, renewable energy resources have serious potential in contributing to the overall energy picture.

Concern: ALT.033 **Comment:** 090.027 **Subtopic:** Analysis of alternatives
Commenter: Savela **Page:** 24 **Org:** Minnesota Public Interest Research Group

A public interest group commented that renewable energy technologies (RETs) are not hindered by the lack of resources, rather their development depends greatly on institutional change. The group believes that utilities must become actively involved in gaining a better understanding of emerging technologies so that they can assist in a change to a renewable energy future. Allowing license renewal applicants to avoid addressing the RET possibilities in their service areas hinders the advancement of clean, efficient power generation.

Concern: ALT.026 **Comment:** 090.028 **Subtopic:** Wind power
Commenter: Savela **Page:** 24–27 **Org:** Minnesota Public Interest Research Group

A public interest group noted that conservative estimates say that the available wind power in this country could provide 10 times our total electric use. The group believes that wind energy's greatest potential contribution is in bulk electricity generation, and that wind energy can make significant contributions to electrical generation in virtually all areas of the country. Wind power is already providing 1 percent of California's total electrical generation, corresponding to over 2 billion kWh of electricity in 1989. Additionally, the DOE has identified 37 States that have sufficient wind resources to support development of utility-sized wind power plants. While there has always been some concern about the costs associated with wind power, within 10 years wind energy is projected to cost less than $.05/kWh. In the long term, say 30 years, the cost could fall below $.03/kWh. This trend in cost would lead to a significant increase in online wind capacity.

The worldwide market for wind power is on the verge of a major expansion, with research and development for wind power commercialization far surpassing the current domestic expenditures. If there is not a sustained domestic commitment to wind energy, both domestic and international market opportunities will be lost to foreign industry. Wind power technological advances are many, yet there is still room for improvement.

Minnesota has a huge resource of wind. In fact, Minnesota's wind energy potential is many times higher than California's. In 1990, the Pacific Northwest Laboratory estimated that Minnesota's wind electric potential is 14 times the State's total consumption. Buffalo Ridge in Southwestern Minnesota, in particular, is a tremendous resource of wind. At the hearings regarding an additional ISFSI at the Prairie Island generating plant, Dan Juhl, Vice President of the Minnesota Wind Energy Association and President of Minnesota Wind Power, Inc., estimated that the 780 square miles of Buffalo Ridge could conservatively support 4,800 MW of wind capacity. This would take up about 20,000 acres (a small fraction of the over 500,000 acres that could be developed) and 9,600 turbines. Juhl calculated that an ambitious program could install 4,800 MW of wind capacity within 3–5 years in Minnesota. This capacity could easily produce as much energy as Monticello (545 MW) or Prairie Island (1,060 MW). Mr. Juhl estimates that costs for Buffalo Ridge operations will be $.012 kWh compared to $.015/kWh for Prairie Island.

The potential to couple wind systems with stand-by natural gas or ethanol generators promises even greater benefits. If you marry wind systems with natural gas peaking plants, you create a "perfect displacement" for a nuclear facility like Prairie Island. Wind systems can also be combined with generators that use ethanol as a stand-by fuel. Sweet sorghum produces ethanol at $0.70/gal, plus a combustible fiber fuel by-product that can be used as a very cost-effective fuel for baseload generation (see comment on biomass potential).

The main drawback of wind power is that it is not available in all sections of the country. However, this is further proof that the GEIS conclusions about wind are inaccurate. Minnesota has resources that other States might not have; therefore, each individual utility should be able to decide what resources can best be utilized in meeting customer demand. For this reason alone, a nongeneric site-specific approach would be more appropriate than a Category 1 classification.

Concern: ALT.017	**Comment:** 090.029	**Subtopic:** Biomass energy/Categorization
Commenter: Savela	**Page:** 27–31	**Org:** Minnesota Public Interest Research Group

A public interest group noted that the NRC concludes that "biomass power is a source of baseload capacity that could be used to replace or offset nuclear capacity, where it is found to be economical." However, biomass power cannot compare to the enormous amount of employment attributed to biomass technology. These two facts alone should be sufficient to make biomass a viable environmental and cost-effective alternative to license renewal.

Concern: NRR.009	**Comment:** 090.030	**Subtopic:** Categorization of issues
Commenter: Savela	**Page:** 31	**Org:** Minnesota Public Interest Research Group

A public interest group opposes the use of the Category 1 classification to resolve the issues of spent fuel waste management, need for generating capacity, and the impact of alternative energy resources. It also opposes the Category 1 classification for other environmental impacts not covered in its comments, such as aquatic ecology. The GEIS is inadequate; future developments affecting these issues are much too unpredictable to be dealt with in a generic process. (This comment is already covered in previous MPIRG comments.)

Concern: NEP.005	**Comment:** 090.031	**Subtopic:** Public participation/site-specific EISs
Commenter: Savela	**Page:** 31–32	**Org:** Minnesota Public Interest Research Group

A public interest group commented that a major theme running through its arguments is that a Category 1 classification would prevent future evaluation of issues and thereby exclude public participation in the license renewal process. Further, the whole process of notifying the public is inadequate, and the location of public hearings in one or a few cities limits public participation. The group urges the NRC to abandon generic evaluations of environmental impacts during the license renewal process. (See 090.001, which expresses this same concern.)

Docket Number: 091

Concern: NEP.005	**Comment:** 091.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Yarmo	**Page:** 1	**Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal. With the proposed Part 51 rulemaking, he believes citizens will no longer be able to participate in the license renewal process stating "let the public be informed and continue to voice their concerns." He also implied that the EA is the State's responsibility and that the NRC should allow States to set stricter standards than the NRC's proposed Part 51 rule.

Concern: NEP.001	**Comment:** 092.001	**Subtopic:** Purpose or use of GEIS
Commenter: Swartz	**Page:** 1–3	**Org:** Council on Environmental Quality

A Federal agency expressed a substantial confusion regarding the purpose of the GEIS. Based on the *Federal Register* notice on the proposed rule and Chapter 9 of the GEIS, and contrary to the statements made at the Workshop, it appears that the purpose of the GEIS is to "support future decisions on specific license renewal applications . . . . A statement to that effect should be included in the final version of the GEIS." Moreover, it views the GEIS "as a programmatic document to examine those environmental issues which are common to the license renewal of all nuclear power plants." Under the CEQ regulations, "all environmental issues—those addressed generically in the programmatic EIS and those addressed in the site-specific NEPA document—must be considered by the agency in reaching a conclusion . . . ." While agreeing that the preparation of an EA, rather than an EIS, would be more appropriate in certain cases, the commenter reminds the NRC that the preparation of an EA also requires public participation (i.e., the requirements of 40 CFR 1506.6 apply to EAs and EISs). The NRC may also consider the GEIS as a technical study to be referenced in subsequent site-specific NEPA documents.

Concern: NEP.001	**Comment:** 092.002	**Subtopic:** Purpose or use of GEIS
Commenter: Swartz	**Page:** 3–4; 6	**Org:** Council on Environmental Quality

A Federal agency does not believe that the NRC should "reach `conclusions' regarding the environmental impact of a future relicensing decision." In determining whether to renew a particular plant's operating license, the "NRC must take into account both the broad environmental issues addressed in the GEIS and the narrower environmental issues addressed in a site-specific NEPA document."

Concern: NEP.010	**Comment:** 092.003	**Subtopic:** Analysis of alternatives
Commenter: Swartz	**Page:** 4	**Org:** Council on Environmental Quality

A Federal agency noted that the NRC's cost-benefit analysis "does not adequately account for environmental costs and benefits because such costs and benefits are difficult, if not impossible to quantify."

Concern: NEP.005	**Comment:** 092.004	**Subtopic:** Public participation/site-specific EISs
Commenter: Swartz	**Page:** 5	**Org:** Council on Environmental Quality

A Federal agency noted that the proposed rule does not further the purposes of NEPA, which are "to encourage public involvement in the NEPA process and to encourage environmentally-aware decision making in Federal agencies." Codification of the proposed rule would preclude the public from challenging the generic conclusions for a particular plant.

Concern: NEP.007 **Comment:** 092.005 **Subtopic:** Cumulative impacts
Commenter: Swartz **Page:** 5 **Org:** CEQ

A Federal agency representative noted that under the NRC's proposed scheme, it will not be required to reexamine those 80 Category 1 and some of the 22 Category 2 issues in a subsequent decision to renew an operating license. This approach does not allow for the consideration of the cumulative impacts from "small" Category 1 issues or the cumulative impacts of all issues in the three different categories.

Docket Number: 093

Concern: NEP.005 **Comment:** 093.001 **Subtopic:** Public participation/site-specific EISs
Commenter: Daley **Page:** 1, 6 **Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group is concerned that the use of a GEIS will damage the public's ability to fully investigate and question the specific impacts of a particular nuclear facility. Additionally, it believes the GEIS is seriously flawed and that many of the issues can only be obtained by site- and time-specific analysis. Therefore, in the interests of the most accurate assessment of risk to the public and the environment, it believes that more empirical evidence needs to be accumulated as the nuclear industry struggles to work the bugs out of the first generation.

Concern: NGC.004 **Comment:** 093.002 **Subtopic:** State participation
Commenter: Daley **Page:** 2 **Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group disagrees with the GEIS conclusion that additional generating capacity is required which can be most economically met through nuclear power and thus questions the validity of the GEIS power prediction models. It believes that the closing of Yankee Rowe contradicts this conclusion, with the utility owners mentioning there was a glut of supply and the existence of more economical supply alternatives. Additionally, it noted that Seabrook Nuclear Power Station's planned capacity in 1973 to meet the demand for 1986 was overstated, and the utility was unable to sell its output economically because of a regional glut.

Concern: NGC.004 **Comment:** 093.003 **Subtopic:** State participation
Commenter: Daley **Page:** 2 **Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group believes that the GEIS does not adequately address efficiency and conservation alternatives to power supply. The GEIS draws conclusions on these alternatives based on the use of existing efficiency and conservation technologies which are currently in their infancy. The DSM programs for many utilities are very new and conclusions about efficiency and

conservation technologies cannot accurately be made at this time. Therefore, these alternatives should be evaluated on a site-specific basis at license renewal.

Concern: ALT.033	**Comment:** 093.004	**Subtopic:** Analysis of alternatives
Commenter: Daley	**Page:** 2	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group believes that renewable energy sources should be considered on a site-specific basis. Also, it believes that the benefits of renewable energy were not accurately accounted for in the GEIS. It pointed out that the socioeconomic impacts of this technology are predominantly local, resulting in greater job creation and a higher economic multiplier than large, centralized facilities.

Concern: ALT.023	**Comment:** 093.005	**Subtopic:** Photovoltaics
Commenter: Daley	**Page:** 3	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group disagrees with the GEIS assumption that land use is a major negative impact of photovoltaic technology. The assumption is based on the requirement for new land which it believes will not be required. It pointed out that photovoltaic technology is by nature modular and decentralized; however it can be centralized into a central generating station. Currently, the technology is primarily used in remote applications using available roof area, which does not require new land. Furthermore, the International Council of Shopping Centers reported in 1991 that 4.5 billion square feet of retail space exists in shopping malls. This roof area could support photovoltaic facilities with a capacity of 13,950 MW using the 7,400 acre per 1,000 MW standard indicated in NUREG-1437, Vol. I, page 9-9. This is equivalent to 14 large nuclear power plants and has no land use impact.

Concern: SOE.004	**Comment:** 093.006	**Subtopic:** Local infrastructure
Commenter: Daley	**Page:** 4	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group believes socioeconomic conditions warrant site-specific analysis at license expiration, not 20 years earlier at license renewal. It does not believe that existing economic models can accurately predict future socioeconomic conditions without requiring constant updating.

Concern: NRR.002	**Comment:** 093.007	**Subtopic:** GEIS approach
Commenter: Daley	**Page:** 4	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group does not believe that the uranium fuel cycle impact can be generically resolved. The impact is dependent on the characteristics of the release and the individuals impacted by the release. It pointed out that the GEIS compares natural radon with the harm

coming from a human activity (radon released in mill tailings) and hence the impact appears small. The impact may not be small for the people affected by this nuclear pollution, and they should be given the opportunity to debate this issue at license renewal.

Concern: POA.015	**Comment:** 093.008	**Subtopic:** Generic safety issues
Commenter: Daley	**Page:** 5	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group believes that the GEIS did not consider several dozen outstanding GSIs. These generic issues represent areas of uncertain risk to the public and the environment posed by existing conditions or practices at nuclear power plants. It questioned whether the NRC intended to resolve these outstanding concerns before allowing relicensing, or whether NRC will carry over these problems which, it believes, would be a failure of NRC regulatory responsibility.

Concern: SWM.016	**Comment:** 093.009	**Subtopic:** Categorization/SWM issues
Commenter: Daley	**Page:** 5, 6	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group believes that solid waste management should not be a generically resolved issue. It believes that no accurate assessment of this impact can be made until real experience is gained from the actual operation of facilities (both under LLRWPA and the DOE HLW repository program). Additionally, the NRC public dose standard for a LLW disposal facility is 5-times the Canadian standard of dose risk, which was developed using internationally-accepted standards and limits cancer risk from radiation exposure to $1x10^{-6}$ per year.

Concern: DEC.001	**Comment:** 093.010	**Subtopic:** Categorization of issues
Commenter: Daley	**Page:** 6	**Org:** New England Coalition on Nuclear Pollution, Inc.

A public interest group disagreed with the GEIS categorization of decommissioning. The technological problems of accomplishing decommissioning safely have yet to be resolved since no commercial reactor of 500–1,000 MW has been decommissioned yet. Yankee Rowe is only a 185 MW plant, and lessons learned at decommissioning may not be applicable to decommissioning a 500–1,000 MW plant.

Docket Number: 094

Concern: NEP.005	**Comment:** 094.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Yarmo	**Page:** 1	**Org:** Individual

A private citizen opposes the use of a GEIS for plant license renewal. With the proposed Part 51 rulemaking, she believes citizens will no longer be able to participate in the license renewal

process stating "let the public be infomed and continue to voice their concerns." She also implied that the EA is the State's responsibility and that NRC should allow States to set stricter standards than NRC's proposed Part 51 rule.

Docket Number: 095

Concern: NRR.005	**Comment:** 095.001	**Subtopic:** Input on specific sites
Commenter: Howland	**Page:** 1	**Org:** Individuals

Private citizens were concerned with the flexibility in the GEIS guidelines to take into consideration unique environmental considerations, such as the Deerfield watershed. They recommend that the proposed Part 51 be sensitive to these kinds of local concerns.

Concern: NONE	**Comment:** 095.002	**Subtopic:** Supportive statement
Commenter: Howland	**Page:** 1–2	**Org:** Individuals

Private citizens agree with the GEIS methodology. They believe that much current and historical data is available on present safety and environmental operating guidelines. Additionally, 10 CFR 2.758 provides a mechanism for including new environmental impact data. Also, depending solely on a site determination concept is impractical, unnecessarily costly, and time consuming. Furthermore, they do not want to see regulations become too onerous for compliance because the consequences can be costly in human terms, as well as economic ones, as happened at Yankee Atomic Electric Company in Rowe, Massachusetts.

Docket Number: 096

Concern: NEP.005	**Comment:** 096.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Schmidt	**Page:** 1	**Org:** New Jersey Department of Environmental Protection and Energy

A State agency suggested that while the NRC's findings on specific individual impacts associated with license renewal appear to be appropriate, the impacts generically dispositioned in the GEIS will not be open for public comment during a nuclear power plant's license renewal proceeding. The agency believes these impacts should be open for comment if substantiated plant-specific, region-specific, or ecosystem-specific information can be presented.

Concern: GIS.003 **Comment:** 096.002 **Subtopic:** Substantiation of conclusions-documentation

Commenter: Schmidt Page: A01 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the approach used by the NRC to draw the conclusions in the GEIS should be clearly explained. It appears that many of the conclusions reached were based entirely on expert judgment, and while this approach is completely acceptable, the specific procedures used to elicit and document the expert judgments should be included in the GEIS, including how inherent biases were addressed. Without this information, a reviewer is left wondering how conclusions were made.

Concern: POA.024 **Comment:** 096.003 **Subtopic:** Severe accidents

Commenter: Schmidt **Page:** A01–A02 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency supported the NRC's approach in using the EI concept to assess the environmental impacts of accidents during the license renewal period. However, the agency recommends that NRC staff consider using the soon to be completed IPEs to verify and confirm the conservatism of the assessment. Although Generic Letter 88-20 does not specifically require a PRA, the agency believes that most utilities are conducting some level of PRA to meet the intent of the Generic Letter. Therefore, the NRC should consider using the IPE results of those plants that complete a level 2 PRA to determine the offsite consequences associated with the postulated accident scenarios at the plants. These consequences could then be compared to the consequences calculated by the staff using the EI methodology, with a subsequent revision to the GEIS if warranted.

Concern: POA.003 **Comment:** 096.004 **Subtopic:** Analysis-approach, assumptions, and data

Commenter: Schmidt **Page:** A02 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that it is not evident in the GEIS how NRC staff used the relevant risk information from NUREG-1150, *Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants* (p. 5-19, lines 13–14). The GEIS should clarify if the statement refers to Table 5.11, where a comparison is made between the early and latent fatality estimates presented in the GEIS and those presented in NUREG-1150.

Concern: POA.016 **Comment:** 096.005 **Subtopic:** Severe accidents

Commenter: Schmidt **Page:** A02 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the assumption used in the accident analysis that regulatory controls will ensure that the physical plant condition will be maintained at a constant level during the renewal period is too conservative [although the reviewer believes that the agency really

means too optimistic]. The assumption does not consider a "learning curve" period in which new regulatory controls for license renewal are phased in. During this early period, the effectiveness of the new regulatory controls will not be known, and age-related component failures may increase. Additionally, the uncertainty discussion in Section 5.3.5 should address the possibility that a utility could make a conscious decision to allow plant components with very low damage frequencies to deteriorate until their damage frequencies approach the NRC's safety goal values.

Concern: POA.009 **Comment:** 096.006 **Subtopic:** Categorization of issues
Commenter: Schmidt **Page:** A03 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the GEIS, on pages 5-94 and 5-95, did not explicitly estimate the risk from externally-caused accidents. The agency recommends that the NRC reevaluate the issue after all nuclear power plants complete their individual plant examination of external events for severe accident vulnerabilities, and revise the GEIS if warranted.

Concern: SWM.001 **Comment:** 096.007 **Subtopic:** LLW storage/disposal
Commenter: Schmidt **Page:** A03 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the primary impact that should be addressed in the solid waste management portion of the GEIS is whether facilities will be available for the disposal of the additional waste generated as a result of license renewal. This is particularly important since efforts within the U.S. to site both LLW and HLW disposal facilities have been largely unsuccessful.

Concern: SWM.014 **Comment:** 096.008 **Subtopic:** Mixed waste
Commenter: Schmidt **Page:** A03 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that plants which do not have access to a mixed waste disposal facility should be required to include an assessment of the impacts of protracted onsite storage of the mixed waste in their environmental report. This would be similar to the requirements associated with LLW. Since there are currently no disposal facilities in the U.S. for such waste, it will certainly have to be stored onsite for an unknown period of time. Therefore, a site-specific discussion of onsite storage of mixed waste should be required in the applicant's environmental report due to the fact that there are no disposal facilities available.

Concern: SWM.009 **Comment:** 096.009 **Subtopic:** Spent fuel
Commenter: Schmidt **Page:** A03–A04 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the specific plans for onsite spent fuel storage during the license renewal period should be addressed on a plant-by-plant basis, and not be included in a generic

document. Onsite spent fuel storage is similar to storing fuel at an MRS facility. Even though NRC staff considers the potential environmental impacts of onsite spent fuel storage to be insignificant, this issue warrants a site-specific analysis in an applicant's environmental report because of the public's perception.

Concern: SWM.033 **Comment:** 096.010 **Subtopic:** LLW storage/disposal
Commenter: Schmidt **Page:** A04 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the statement in the GEIS (p. 6-24, lines 35–37) that "all LLW compacts and declared unaffiliated States are planning to accommodate anticipated waste streams from license-renewal-associated refurbishment and an additional 20 years of normal operations (Table 6.8)" appears only to refer to those LLW compacts and declared unaffiliated States that are encompassed by the sample of plants analyzed in the section. If so, then the statement should be revised to explicitly state so. If not, the statement is inconsistent with a previous statement on the same page that some compacts assume that all nuclear power plants in their regions may be decommissioned after expiration of their current operating license.

Concern: SWM.034 **Comment:** 096.011 **Subtopic:** Spent fuel
Commenter: Schmidt **Page:** A04 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the GEIS statement (p. 6-28, lines 39–40) that the DOE projects that site selection for an MRS could occur as early as 1992, with subsequent acquisition of spent fuel from utilities in 1998, is too optimistic. A September 1991 report by the GAO indicated that a facility is unlikely to be available by 1998. This uncertainty and its impact should be addressed in the GEIS.

Concern: SWM.011 **Comment:** 096.012 **Subtopic:** Spent fuel
Commenter: Schmidt **Page:** A04 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that Oyster Creek should be added to the list of plants that will exhaust their spent fuel pool's storage capacity by the year 2000 (p. 6-29, lines 5–11). Based on information provided by GPU Nuclear, the utility will exhaust its full core discharge reserve margin in October 1996 and its total spent fuel pool capacity in October 2000.

Concern: DEC.012 **Comment:** 096.013 **Subtopic:** Radiation dose
Commenter: Schmidt **Page:** A04 **Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that the statement on page 7-16, line 10, that "because ^{63}Ni is a [beta] emitter, it contributes nothing to the dose to workers or the public" is incorrect. Significant amounts of airborne contamination will likely be generated during decommissioning as plant

components and structures are dismantled. The agency indicated that this airborne contamination will pose a significant internal exposure hazard to plant workers.

Concern: DEC.004	**Comment:** 096.014	**Subtopic:** Waste management
Commenter: Schmidt	**Page:** A05	**Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that on page 7-17, line 21, the NRC does not provide an estimate of the amount of liquid waste to be released during decommissioning because no such estimate is available in the literature. The agency believes that NRC staff should be responsible for developing an estimate for the GEIS.

Concern: DEC.013	**Comment:** 096.015	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Schmidt	**Page:** A05	**Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented on page 7-25, lines 24–25, that the statement "in general, the activities and costs associated with decommissioning are well understood" is inconsistent with a statement on page 7-27, line 4, that "total decommissioning costs are uncertain."

Concern: NRR.004	**Comment:** 096.016	**Subtopic:** Studies and analysis
Commenter: Schmidt	**Page:** A05	**Org:** New Jersey Department of Environmental Protection and Energy

A State agency commented that within the GEIS, the main focus was to identify those impacts expected to be generic for license renewal, and to define the issues that need to be addressed by applicants in plant-specific license renewal proceedings. The other stated objective of the GEIS—to categorize the severity of identified environmental impacts as small, moderate, or large—appears to have received insufficient coverage in the document. Such characterizations are not explicitly made in the GEIS until Section 10, Summary and Conclusions, treating the evaluation of the actual severity of the identified impacts as an afterthought.

Docket Number: 097

Concern: NEP.005	**Comment:** 097.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Hallsmith	**Page:** 2	**Org:** Individual

A private citizen argues that two purposes of the EISs required by the NEPA—namely, presenting a comprehensive picture of the impacts and the alternatives of a governmental action, and the involvement of the public in the EIS process and governmental decision making—are "being turned on their head" by the GEIS. (See Comments 097.002 and 097.003.)

Concern: NRR.002 **Comment:** 097.002 **Subtopic:** GEIS approach
Commenter: Hallsmith **Page:** 2 **Org:** Individual

A private citizen declares that the generic approach to addressing environmental impacts is an "outrage against common sense".

Concern: ALT.032 **Comment:** 097.003 **Subtopic:** Analysis of alternatives/ Economic analysis
Commenter: Hallsmith **Page:** 4 **Org:** Individual

A private citizen declares that the GEIS glosses over the cost-benefit issue by asserting that there are no reasonable alternatives to the renewal of licenses for existing plants, yet the GEIS provided no detailed cost analysis that included all operating costs of the plants.

Concern: ALT.030 **Comment:** 097.004 **Subtopic:** Analysis of alternatives/ Conservation
Commenter: Hallsmith **Page:** 6 **Org:** Individual

A private citizen claims the savings associated with an aggressive conservation/load management strategy are significant.

Concern: NRR.002 **Comment:** 097.005 **Subtopic:** GEIS approach
Commenter: Hallsmith **Page:** 7 **Org:** Individual

A private citizen points out that the Deerfield River Compact and the Franklin County Commissioners have requested their Federal representatives to file legislation requiring the NRC and nuclear power plants to set up a public planning process similar to the one currently underway for the hydroelectric facilities along the Deerfield River.

Docket Number: 098

Concern: NRR.002 **Comment:** 098.001 **Subtopic:** GEIS approach
Commenter: Glassman **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 099

Concern: NONE	**Comment:** 099.001	**Subtopic:** Supportive statement
Commenter: Young	**Page:** 1	**Org:** U.S. Department of Energy

A Federal agency agrees that many environmental issues concerned with license renewal can be dealt with in a generic fashion and it agrees, in general, with the analysis provided in the GEIS.

Docket Number: 100

Concern: NEP.005	**Comment:** 100.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Weiss	**Page:** 1	**Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 101

Concern: NONE	**Comment:** 101.001	**Subtopic:** References Docket No. 63
Commenter: Gates	**Page:** 1	**Org:** Omaha Public Power District

An electric utility company agrees with the comments submitted by NUMARC on the proposed Part 51 rule.

Docket Number: 102

Concern: NONE	**Comment:** 102.001	**Subtopic:** References Docket No. 63
Commenter: Burzynski	**Page:** 1	**Org:** Tennessee Valley Authority

An electric utility company agrees with the comments submitted by NUMARC on the proposed Part 51 rule.

Docket Number: 103

Concern: NONE
Commenter: Withers
Comment: 103.001
Page: 1
Subtopic: References Docket No. 63
Org: Wolf Creek Nuclear Operating Corporation

An electric utility company agrees with the comments submitted by NUMARC on the proposed Part 51 rule.

Docket Number: 104

Concern: NRR.002
Commenter: Volterra
Comment: 104.001
Page: 1
Subtopic: GEIS approach
Org: Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 105

Concern: NRR.002
Commenter: Budin
Comment: 105.001
Page: 1
Subtopic: GEIS approach
Org: Individual

A private citizen objects to the NRC proposal for generic environmental review of issues relevant to the renewal of nuclear power plant operating licenses. He contends that public participation in every aspect of the approval of these plants is important.

Docket Number: 106

Concern: NEP.005
Commenter: Lattrell
Comment: 106.001
Page: 1
Subtopic: Public participation/site-specific EISs
Org: Deerfield River Compact

A regional agency contends that a generic approach to the EIA for relicensing of nuclear power plants is unacceptable. It asserts that the intent of the EIS process required by NEPA is to provide all Federal agencies involved in funding or permitting a project with a comprehensive picture of associated environmental issues. (This comment is a restatement of a comment it submitted previously. See Comment A113.001.)

Concern: ALT.001 **Comment:** 106.002 **Subtopic:** Categorization of issues
Commenter: Lattrell **Page:** 2 **Org:** Deerfield River Compact

A regional agency contends that EIAs need to be done for each plant. In addition, alternatives to license renewal need to be explored for each facility, taking into account 1) the relative importance of the facility to the regional energy delivery system, and 2) replacement sources including energy conservation and demand management. (This comment is a restatement of a comment it submitted previously. See Comment A113.002.)

Concern: POA.009 **Comment:** 106.003 **Subtopic:** Categorization of issues
Commenter: Lattrell **Page:** 2 **Org:** Deerfield River Compact

A regional agency expressed concern that evacuation plans were not discussed in the GEIS section dealing with postulated accidents and notes that this is one of the most important concerns of the towns in western Franklin County, Massachusetts. (This comment is a restatement of a comment it submitted previously. See Comment A113.003.)

Concern: GIS.016 **Comment:** 106.004 **Subtopic:** Rulemaking & GEIS approach
Commenter: Lattrell **Page:** 2 **Org:** Deerfield River Compact

A regional agency contends that several site-specific issues are excluded from consideration in the GEIS, specifically, plant operating history, seismic risks, adjacent site hazards, economically valuable fisheries and recreation areas in the Deerfield River and surrounding countryside, and radiation impacts on microclimatic, surface terrestrial and groundwater pathways. (This comment is a restatement of a comment it submitted previously. See Comment A113.004.)

Concern: SWM.021 **Comment:** 106.005 **Subtopic:** Uranium fuel cycle
Commenter: Lattrell **Page:** 2 **Org:** Deerfield River Compact

A regional agency contends that regional issues rejected in the GEIS include analyses of extended fuel-cycle activities and the environmental impacts of the uranium mining and milling required to produce the fuel for an additional 20 years of operation. No assessment has been made of 1) the impact of the additional fuel manufacturing facilities that will likely be needed, or 2) the number of such facilities that will be needed. (This comment is a restatement of a comment it submitted previously. See Comment A113.005.)

Concern: NRR.001 **Comment:** 106.006 **Subtopic:** Waste disposal
Commenter: Lattrell **Page:** 3 **Org:** Deerfield River Compact

A regional agency contends that the nuclear power industry can neither demonstrate the technologies nor the acceptable long-term storage sites for the spent fuel, refurbishment wastes, and LLW that will accumulate from an additional 20 years of operation. Moreover, the States are experiencing difficulty siting even LLW storage facilities. (This comment is a restatement of a comment it submitted previously. See Comment A113.006.)

Concern: GIS.007 **Comment:** 106.007 **Subtopic:** Cost-benefit analysis
Commenter: Lattrell **Page:** 3 **Org:** Deerfield River Compact

A regional agency argues that accurate cost-benefit conclusions cannot be drawn about the merits of an additional 20 years operation until the relicensing assessment includes an analysis of all the costs for nuclear generating facilities, i.e., fuel production costs, plant costs, liability costs, and waste disposal costs.

Concern: NEP.005 **Comment:** 106.008 **Subtopic:** Public participation/site-specific EISs
Commenter: Lattrell **Page:** 3 **Org:** Deerfield River Compact

A regional agency contends that there has not been a consistent methodology used to site nuclear power facilities, and therefore there is no way to make a generic assessment of their environmental effects. Also, making a generic assessment is a violation of NEPA, which specifically requires the assessment of local conditions.

Concern: NEP.005 **Comment:** 106.009 **Subtopic:** Public participation/site-specific EISs
Commenter: Lattrell **Page:** 3, 4 **Org:** Deerfield River Compact

A regional agency contends that the GEIS categorization process is based on flawed reasoning, and it concludes that the GEIS is not appropriate. Examples of categorization considered "flawed" by the agency include the treatment of 1) the nuclear waste stream, 2) nuclear facility decommissioning, 3) postulated accidents and related evacuation planning, 4) the need for generating capacity, and 5) aquatic habits and organisms.

Concern: NEP.019 **Comment:** 106.010 **Subtopic:** Rulemaking process
Commenter: Lattrell **Page:** 4, 5 **Org:** Deerfield River Compact

A regional agency points out that it strongly favors a process that is similar to the FERC process where relicensing must be responsive to existing comprehensive planning documents and requirements that are endorsed by State or Federal agencies. It is very concerned that licensing and relicensing are treated as separate issues, and it contends that all license renewals should be treated as new licenses subject to all current environmental laws and regulations.

Docket Number: 107

Concern: SOE.001 **Comment:** 107.001 **Subtopic:** Transportation-categorization
Commenter: Schnell **Page:** 2 **Org:** Union Electric

An electric utility company is concerned with 1) the Category 3 rating assigned to the transportation impacts of refurbishment issue, and 2) in connection with this Category 3 rating, a

major assumption made in the GEIS, namely, "that plant modifications undertaken specifically for license renewal would be accomplished within the normal outage cycles beginning 8 years before expiration of the original license, and during one 9-month refurbishment outage immediately before the old license expires." The utility contends that 1) the GEIS should incorporate the impacts of an aging management program, which could preclude the assumed 9-month refurbishment outage; and 2) the rating for the transportation impacts of refurbishment issue should be adjusted to Category 2.

Concern: GIS.012 **Comment:** 107.002 **Subtopic:** Cost-benefit analysis
Commenter: Schnell **Page:** 3 **Org:** Union Electric

An electric utility company notes that the comparison of costs, in the discussion of coal as an alternative energy source, does not take into account the impact on cost associated with compliance with the CAA. It contends that the economic and environmental costs associated with the regulations of this Act should be factored into the cost comparison.

Concern: NONE **Comment:** 107.003 **Subtopic:** References Docket 63
Commenter: Schnell **Page:** 3 **Org:** Union Electric

An electric utility company endorses the NUMARC responses to the proposed rule and its principal support documents.

Docket Number: 108

Concern: NRR.002 **Comment:** 108.001 **Subtopic:** GEIS approach
Commenter: Grant **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 109

Concern: NRR.002 **Comment:** 109.001 **Subtopic:** GEIS approach
Commenter: Stout, M.K. **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 110

Concern: NRR.002 **Comment:** 110.001 **Subtopic:** GEIS approach
Commenter: Budin **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns. He also indicated that past history of nuclear plants has shown the importance of public participation in every aspect of approval with respect to these plans.

Docket Number: 111

Concern: NRR.002 **Comment:** 111.001 **Subtopic:** GEIS approach
Commenter: Langford **Page:** 1 **Org:** Individual

A private citizen opposes the proposed change in the environmental review process for nuclear power plants and contends that the proposed change would exclude the public from expressing its concerns.

Concern: NRR.001 **Comment:** 111.002 **Subtopic:** Waste disposal
Commenter: Langford **Page:** 1 **Org:** Individual

A private citizen opposes the burial of radioactive waste and contends that it contributes to the "public's delusion of safety by keeping the nuclear junk-pile out of sight". Also, he urges that independent teams of inspectors (i.e., teams excluding government and utility officials) be allowed to monitor the waste sites.

Docket Number: 112

Concern: NRR.002 **Comment:** 112.001 **Subtopic:** GEIS approach
Commenter: Stout, T.M. **Page:** 1 **Org:** Individual

A private citizen opposes the use of generic environmental statements, and urges that the public be informed and allowed to voice their concerns.

Docket Number: 113

Concern: NONE	**Comment:** 113.001	**Subtopic:** Supportive statement
Commenter: Weigand	**Page:** 1	**Org:** Vermont Yankee Nuclear Power Corporation

An electric utility company supports 1) the proposed GEIS approach, and 2) the NRC's position that it is appropriate, under NEPA and relevant case law, to address potential environmental impacts on a generic basis. (The utility is concerned that many arguments against the GEIS approach are based on an incorrect premise, namely, that extending the life of an existing plant is the same as building a new plant.)

Docket Number: 114

Concern: SOE.007	**Comment:** 114.001	**Subtopic:** Historic resources impacts and refurbishment/Categorization
Commenter: Buford	**Page:** 1	**Org:** Arkansas Historic Preservation Program

A State agency expressed concern that the impact to cultural resources have not been adequately addressed. It cites Section 106 of the National Historic Preservation Act (NHPA) requiring Federal agencies to take into account the effect on historic properties of their action to permit, assist, or license, and that they allow the Advisory Council on Historic Preservation an opportunity to comment on these actions. It urges the NRC to address this issue in the final GEIS.

Docket Number: 115

Concern: NRR.002	**Comment:** 115.001	**Subtopic:** GEIS approach
Commenter: Smith	**Page:** 1	**Org:** Individual

A private citizen opposes the GEIS for license renewal because it precludes public participation, and therefore many safety, health, waste, and cost-related issues will not be raised. Moreover,

those States who choose to set more stringent protection standards than Federal standards should be allowed to do so by the NRC.

Docket Number: 116

Concern: NEP.005	**Comment:** 116.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Sorensen	**Page:** 1	**Org:** Windham Regional Commission

A regional agency contends that the preparation of the GEIS contradicts NEPA. It is particularly concerned about elimination of local government and public involvement and comment on impacts related to a relicensing decision for a specific plant.

Concern: NEP.009	**Comment:** 116.002	**Subtopic:** Periodic assessments
Commenter: Sorensen	**Page:** 1	**Org:** Windham Regional Commission

A regional agency commented that the GEIS does not adhere to the CEQ's NEPA provisions at 40 CFR 1502.4(c)(2) for the preparation of a GEIS because the decision to relicense each nuclear plant does not have "common timing, impacts [or] alternatives . . .". It believes that only a few impacts associated with the operation of nuclear plants meet these NEPA criteria generically.

Concern: NEP.012	**Comment:** 116.003	**Subtopic:** Regulatory responsibility
Commenter: Sorensen	**Page:** 2	**Org:** Windham Regional Commission

A regional agency contends that the GEIS does not meet the requirements of 40 CFR 1502.5(b) which states, "For applications to the [lead] agency, appropriate EAs or statements shall be commenced no later than immediately after the applications are received. Federal agencies are encouraged to begin preparation of such assessments or statements earlier, preferably with applicable State or local agencies." Specifically, the agency contends that it qualifies as a local agency and has not been consulted or contacted during the preparation of the draft GEIS or the proposed rule.

Concern: GIS.007	**Comment:** 116.004	**Subtopic:** Cost-benefit analysis
Commenter: Sorensen	**Page:** 2	**Org:** Windham Regional Commission

A regional agency commented that the GEIS incorrectly presumes that, with refurbishment, applications for license renewal are feasible. The closure of Yankee Rowe demonstrates that the cost of refurbishment may outweigh the benefits of an additional term of operation.

Docket Number: 117

Concern: NEP.010 **Comment:** 117.001 **Subtopic:** Analysis of alternatives
Commenter: Larsen et al. **Page:** 1 **Org:** Massachusetts Offices of Consumer Affairs and Business Regulation, Environmental Affairs, and Economic Affairs

State agencies pointed out that it has implemented a thorough resource procurement review process for State-regulated electric utilities. Evaluation of the need for resources and the integrated comparison of proposals that bid to meet that need are fundamental components of the Integrated Resource Management (IRM) process. Under IRM, demand side and supply side resource proposals, which could include nuclear relicensing projects, are compared on the basis of social cost, including explicit consideration of certain environmental impacts.

Concern: ALT.001 **Comment:** 117.002 **Subtopic:** Categorization of issues
Commenter: Larsen et al. **Page:** 2 **Org:** Massachusetts Offices of Consumer Affairs and Business Regulation, Environmental Affairs, and Economic Affairs

State agencies disagree with the conclusions reached in the GEIS (i.e., Category 1 designation) with respect to need and alternative resources, and asserts that the determination of need and the consideration of alternatives are most efficiently addressed as part of the Massachusetts IRM process. Such conclusions could interfere with decision making that is a matter for State regulatory review. Moreover, the effort to reach generic conclusions on energy needs or on the existence and characteristics of alternative technologies available to meet those needs, years in advance of potential relicensing proposals, is misguided.

Concern: NEP.012 **Comment:** 117.003 **Subtopic:** Regulatory responsibility
Commenter: Larsen et al. **Page:** 2 **Org:** Massachusetts Offices of Consumer Affairs and Business Regulation, Environmental Affairs, and Economic Affairs

State agencies recommend that specific language be included in the final rule to indicate that NRC's provisions are not intended to impede the goals or interfere with the review processes of State agencies (particularly with respect to the determination of need and choice of alternatives to meet that need).

Docket Number: 118

Concern: GIS.015 **Comment:** 118.001 **Subtopic:** Plant performance
Commenter: Nagle **Page:** 1 **Org:** Massachusetts House of Representatives

A State Representative commented that the conditions are different at each of the nuclear plants:

the age, operational history, design and external environmental demands of each facility are not homogeneous. Therefore, it makes sense to require an in-depth analysis of each plant prior to relicensing. While some may contend that this will be too expensive and bureaucratic, one could argue that these same objections were raised to the creation of the NRC and every other watchdog agency.

Docket Number: 119

Concern: NRR.010	**Comment:** 119.001	**Subtopic:** Rulemaking & GEIS approach
Commenter: Rasin	**Page:** i	**Org:** Nuclear Management and Resources Council

NUMARC commented that the GEIS fully complies with both the spirit and letter of NEPA, as well as meets the judicial mandate requiring Federal agencies to take a "hard look" at the environmental impacts associated with a major Federal action, i.e., license renewal. The GEIS provides an appropriate balance between administrative efficiency and reasonable public involvement. In light of the foregoing, NUMARC strongly urges the NRC to continue to pursue the rulemaking to resolve generically as many of the environmental issues as possible related to license renewal. (See Comment 119.003 as well.)

Concern: NRR.011	**Comment:** 119.002	**Subtopic:** Rulemaking & GEIS approach
Commenter: Rasin	**Page:** 1	**Org:** Nuclear Management and Resources Council

NUMARC believes that the NRC's GEIS rulemaking promotes efficiency in agency decision making by eliminating unnecessary and duplicative reviews for issues that have no environmental impact.

Concern: NRR.012	**Comment:** 119.003	**Subtopic:** Purpose of NEPA approach
Commenter: Rasin	**Page:** 2–3	**Org:** Nuclear Management and Resources Council

NUMARC noted that the purpose of NEPA is to encourage harmony between man and his environment, to promote efforts that will prevent or eliminate environmental damage, and to enrich understanding of ecological systems and natural resources (41 U.S.C. Sec. 4321). NEPA integrates environmental considerations into Federal decision making (see 41 U.S.C. Sections 4331–4333). NUMARC submits that NEPA does not mandate any particular result, but rather that the agency take a "hard look" at the effects of a proposed action (*Kleppe v. Sierra Club*). The scope of this review, NUMARC contends, is subject to a rule of reason (*Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*). NUMARC maintains that NEPA does not require that an EIS evaluate worst-case scenarios. Rather, an agency simply must consider the reasonably foreseeable adverse effects of the proposed action (*Robertson v. Methow Valley Citizens Council*). NUMARC further commented that NEPA requires that a Federal agency include a detailed environmental statement in any recommendations

on a major Federal action significantly affecting the environment; consult with other cognizant Federal agencies prior to making the statement; and make public its statement and any comments of appropriate Federal, State, and local agencies. Thus, NUMARC concludes, NEPA confers extremely broad latitude on Federal agencies with respect to the procedures that may be employed to satisfy the statute. Beyond the above described requirements, NEPA does not prescribe any particular procedure specifying how an agency must discharge its responsibility.

Concern: NRR.013	**Comment:** 119.004	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Rasin	**Page:** 2	**Org:** Nuclear Management and Resources Council

NUMARC commented that the cases of *Robertson v. Methow Valley Citizens Council* (490 U.S.C. 332, 350 [1989]) and *Stryker's Bay Neighborhood Council, Inc. v. Karlen* (444 U.S. 223, 228–29 [1980]) establish that if the adverse environmental effects of a proposed action are adequately identified and evaluated, an agency is not constrained by NEPA from deciding that other values outweigh the environmental cost.

Concern: NRR.014	**Comment:** 119.005	**Subtopic:** Regulatory responsibility
Commenter: Rasin	**Page:** 3	**Org:** Nuclear Management and Resources Council

NUMARC noted that NEPA established the CEQ to provide advice on NEPA issues (42 U.S.C. Sec 4332), and that the CEQ has promulgated procedural guidelines at 40 CFR 1500–1507. NUMARC commented that while these guidelines are entitled to deference (*Andrus v. Sierra Club*, 442 U.S. 347 358 [1979]), they are not binding on an agency unless the agency has expressly adopted them (*Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 743 [3d Cir. 1989]), citing *Township of Lower Alloways Creek v. Public Service Electric & Gas Co.*, 687 F.2d 732, 740 n.16 [3d Cir. 1982]).

Concern: NRR.015	**Comment:** 119.006	**Subtopic:** Rulemaking & GEIS approach
Commenter: Rasin	**Page:** 3–6	**Org:** Nuclear Management and Resources Council

Regarding the question of whether resolving issues by rulemaking (as opposed to adjudication) fully satisfies NEPA, NUMARC submits that as a general matter, a Federal agency has the right to use either of these methods and that it is a long-established principle that the choice between these "lies primarily in the informed discretion of the administrative agency" (*SEC v. Chenery Corp.*). Similarly, in *Natural Resources Defense Council v. NRC*, the Second Circuit ruled that : "An agency has broad discretion to determine in what order, in what forum, and by what procedure it will tackle a complex subject matter."

NUMARC pointed out that this same general principle has been applied specifically to the NRC's responsibilities under NEPA, citing two Supreme Court cases. In the first case, *Vermont Yankee*, supra, the Supreme Court upheld the NRC's broad authority to resolve NEPA issues generically

by rule. The Supreme Court found that notice and comment rulemaking was procedurally adequate for this purpose, emphasizing that "absent constitutional constraints or extremely compelling circumstances, the administrative agencies should be free to fashion their own rules of procedure and to pursue methods of inquiry capable of permitting them to discharge their multitudinous duties." The Court also added that "the only procedural requirements imposed by NEPA are those stated in the plain language of the Act."

The second case was *Baltimore Gas & Electric Co. v. Natural Resources Defense Council*, involving a continuation of the fuel-cycle rulemaking proceeding that had been at issue in *Vermont Yankee*. The Court emphasized that NEPA does not require agencies to adopt any particular internal decision making structure. The generic method chosen by the agency is clearly an appropriate method of conducting the "hard look" required by NEPA . . . (462 U.S. at 100–01 [citations omitted]).

Similarly, NUMARC pointed out that the Federal courts have upheld NRC's use of rulemaking-type procedures to resolve certain NEPA issues generically, such as in *Natural Resources Defense Council v. NRC*, where the U.S. Court of Appeals for the Second Circuit, recognizing that "NEPA does not require extensive administrative proceedings . . . [or] . . . agency hearings," held that the NRC's bifurcation of the environmental inquiry regarding wide-scale use of mixed oxide fuels into a generic evaluation and individual licensing proceedings was well with the NRC's "reasonable latitude to control its docket."

NRC's use of rulemaking-type procedures to resolve certain NEPA issues generically was also endorsed by the ruling in *Minnesota v. NRC*. The D.C. Circuit Court, in addressing the NRC's waste confidence proceeding, agreed that the NRC could properly consider the complex issue of nuclear waste disposal in a generic proceeding, and rejected the argument that NEPA required a more individualized inquiry.

Finally, NUMARC pointed out that NRC's own rules provide evidence of a well-established practice of resolving NEPA issues generically. For example, the NRC promulgated the Table S-4 rule, which generically quantifies the environmental effects of the transportation of fuel and waste (10 CFR 51.52—see 40 FR 1005 [1975]). The NRC also promulgated rules generically determining the need for power issue and eliminating consideration of alternative energy sources at the operating license stage (10 CFR 51.53 and 51.95—see 47 FR 12940 [1982]). Finally, the NRC generically assessed the impacts of spent fuel storage at a reactor site after termination of operations (10 CFR 51.23—see 49 FR 34658 [1984]).

Concern: NRR.016	**Comment:** 119.007	**Subtopic:** Rulemaking & purpose of the GEIS
Commenter: Rasin	**Page:** 6–8	**Org:** Nuclear Management and Resources Council

Regarding the question of whether a rational basis exists for the NRC's generic determinations under NEPA, NUMARC commented that NEPA does not limit the type of issues that may be resolved generically by rulemaking. NUMARC maintains that, in the absence of any statutory limitation, an agency's rulemaking should be sustained if it is not arbitrary and capricious. NUMARC cited the case of *Baltimore Gas & Electric*, reviewing the NRC's Table S-3, which

held that a rule is not arbitrary and capricious if it is "within the bounds of reasoned decision making"—if the agency has considered the relevant factors and has articulated a rational connection between the facts found and the choice made. In short, NUMARC commented, if there is a rational basis upon which to resolve a particular issue generically, the generic resolution of the issue should be sustained.

NUMARC further maintains that there are a number of rational bases upon which an environmental issue associated with nuclear plant operation may be generically resolved. First, where the operation of any plant results in certain offsite activities that are shared by and common to all plants, a generic assessment of the effects of the common activity may be a rational approach. The Table S-3 rule is a prime example, NUMARC pointed out, involving fuel cycle and waste disposal activities that occur away from each nuclear plant site, but are common to all plants. In such a case, NUMARC noted, one evaluation can quantify impacts attributable to all plants. NUMARC pointed out that this is the approach taken in the GEIS for Category 1 issues.

Second, NUMARC noted that environmental effects that are very similar for each plant may be rationally quantified in a generic rule. NUMARC pointed out that the Table S-4 rule addressing transportation of fuel and waste is an example of an individualized activity that each power plant perfoms. Even though each plant transports fuel and waste over different routes through different communities; nevertheless, because of the similarities of fuel and waste transportation at every plant, the NRC has been able to determine, using various conservative assumptions, the expected effects. The applicability of the generic determination is then assured, stated NUMARC, by requiring the applicant to certify compliance with the assumptions underlying the NRC's analysis. NUMARC pointed out that this is essentially the same approach taken in the GEIS for Category 2 issues.

Finally, NUMARC maintains that to generically assess an issue where the experience in many individual proceedings indicates that a predictable generic resolution is appropriate is a rational approach. An example of this is the NRC's rule generically eliminating consideration of need for power and alternative energy sources from environmental reports and impact statements at the operating license stage. NUMARC pointed out that after having considered these issues in a succession of individual cases, the NRC determined that once construction of a nuclear power plant was complete, the plant's power would be valuable and that the possibility of abandoning the project at that point to construct an alternative source would no longer be reasonable (47 FR 12940). Again, NUMARC observed, these issues were specific to each plant, but could be resolved rationally and reasonably by rules based on previous experience.

Concern: NRR.017 **Comment:** 119.008 **Subtopic:** Rulemaking & GEIS approach
Commenter: Rasin **Page:** 8 **Org:** Nuclear Management and Resources Council

NUMARC believes that judicial decisions that have held generic rulemaking as appropriate where factual issues are common to all plants do not preclude rulemaking to resolve NEPA issues generically in other circumstances. NUMARC noted that because it is permissible to resolve by rule factual issues that do not involve particularized situations does not mean that factual issues involving particularized situations may not be generically resolved. If it did, NUMARC argued, the NRC's Table S-4, need for power, and alternative energy source determinations would all be

invalid. Rather, NUMARC commented, what is vital to the validity of a rule is its reasonableness.

NUMARC notes that this approach is particularly compelling because NEPA does not require duplicative reviews, explaining that where a plant has been subjected to a full NEPA review at the construction permit stage, full NEPA consideration "need not be duplicated, absent new information or developments, at the operating license stage" (*Union of Concerned Scientists v. AEC*). NUMARC noted that this principle is equally applicable to the license renewal stage.

Concern: NRR.018	**Comment:** 119.009	**Subtopic:** Periodic assessments
Commenter: Rasin	**Page:** 9–10	**Org:** Nuclear Management and Resources Council

NUMARC submits that the NRC already has in place mechanisms that allow it to consider and accommodate changed or special situations that might warrant either revising the GEIS's conclusions or departure from them in individual cases. 10 CFR 2.758 provides for the waiver of any rule upon a showing of special circumstances such that the application of a rule would not serve its intended purpose. If a party to an individual license renewal proceeding believes that generic environmental findings do not apply to the plant at issue, the party can petition for a waiver of the generic rule, or some portion thereof, for purposes of that proceeding only. Grounds for waiver exist if a party proves "special circumstances" indicating that application of a general rule to a particular case "would not serve the purposes for which the rule or regulation was adopted" (10 CFR 2.758[b]). Also, members of the public can, in the future, request changes to the GEIS by petitioning for the institution of rulemaking proceedings (see 10 CFR 2.802; see also 56 FR 47019). Thus, NUMARC concludes, there are mechanisms through which the GEIS for license renewal could be reconsidered to accommodate changed conditions or special circumstances identified by members of the public. The generic determinations in the GEIS and proposed rule will not foreclose consideration of particularized situations in appropriate cases.

Concern: NRR.019	**Comment:** 119.010	**Subtopic:** Analysis-approach, assumptions, and data
Commenter: Rasin	**Page:** 10–12	**Org:** Nuclear Management and Resources Council

In a comment on uncertainty and generic determinations, NUMARC noted that one might argue that a generic rulemaking approach is unreasonable because of the uncertainty in determining effects from activities that will not occur for many years. NUMARC pointed out that such an argument ignores the factual basis for the GEIS, the procedural mechanisms that can accommodate new information, and most importantly, the fact that any NEPA inquiry is predictive in nature.

NUMARC pointed out that a high degree of prospective analysis is involved in NEPA evaluations (see *Minnesota v. NRC*, noting that the ultimate determination of the environmental impact of nuclear waste disposal "can never rise above a prediction"). In considering whether to grant an operating license, for example, the NRC predicts the effects of plant operations over a 40-year period, makes estimates of population growth and affected resources, and makes judgments about technology and risk. NUMARC does not contend that every prediction will prove to be precisely

accurate, only that NEPA is nevertheless satisfied because the NRC is taking a "hard look" at the consequences of its decision.

NUMARC maintained that the decisions in the GEIS are, in fact, more certain than the NRC's NEPA estimates at the initial construction permit or operating license stage. It pointed out that the GEIS was produced by an extensive NRC staff review of existing plants to determine the range of reported effects. Many of the determinations in the GEIS are, thus, based on an evaluation of representative impacts or a bounding of the known and measurable effects of continued operation. NUMARC asserts that such an approach is a reasonable way to address uncertainty.

NUMARC observed further, that regardless of whether EISs are generic or plant-specific, the license renewal decision for each plant may be made a decade or more before the expiration of the plant's current license term. Environmental findings regarding license renewal will always be premised partly upon long-term predictions and projections. Such uncertainties cannot be attributed to, and certainly do not invalidate or undermine generic treatment.

Finally, NUMARC pointed out that the proposed rule notes the NRC's intent to periodically review the GEIS findings and supporting documentation. Future changes in environment-related conditions or assumptions would be assessed as they arise or during these periodic reviews if the NRC determines that such reviews are appropriate. Based upon the mechanisms available through which changes or revisions may be made to the GEIS, the GEIS would not inappropriately "lock in place" environmental findings for decades.

Concern: NRR.020	**Comment:** 119.011	**Subtopic:** Periodic assessments
Commenter: Rasin	**Page:** 12	**Org:** Nuclear Management and Resources Council

NUMARC does not believe that reviews (of the GEIS) should be conducted automatically at any set interval. Rather, it believes the better course is for the NRC to review its GEIS when new developments or experiences suggest that the generic determinations may no longer be reasonable. For example, the NRC could undertake a review if it gains new insights from its experiences in individual license renewal proceedings or in response to petitions for rulemaking.

Concern: NRR.021	**Comment:** 119.012	**Subtopic:** Public participation
Commenter: Rasin	**Page:** 12–15	**Org:** Nuclear Management and Resources Council

NUMARC submits that the proposed rule provides appropriate participation by the public, providing legal and regulatory bases for its comment. NUMARC highlighted six aspects relating to the issue of public participation. First, NUMARC noted that the argument has been propounded that the NRC's proposed rule is inappropriate because it would reduce public participation in environmental reviews. NUMARC believes that this argument simply cannot be squared with firmly established case law, including Supreme Court decisions, approving the final resolution of NEPA issues through generic rulemaking (see Comments 119.006 and 119.007). While resolving an issue generically by rule reduces somewhat the ability of an individual

member of the public to contest the issue, NUMARC asserts, this inevitable consequence does not invalidate the rulemaking process. NUMARC noted that if, as the Supreme Court has said, the NRC may resolve NEPA issues by rulemaking, then the NRC must also be permitted to move to the rulemaking process a person's ability to raise generically resolved issues. Otherwise, the rulemaking process would be meaningless.

Second, NUMARC noted that NEPA does not establish any right of public participation that would preclude the use of rulemaking to resolve environmental issues. In fact, NUMARC stated, NEPA does not even establish an explicit public right to comment on a draft EIS even though the NRC provides such an opportunity as a matter of practice. The absence of any explicit right of public participation in NEPA does not signify that public participation is unimportant, however, NUMARC further added, noting that public participation serves the underlying purposes of NEPA, and the public's potential contribution to an agency's consideration of environmental issues has been broadly recognized. Nevertheless, NUMARC points out, in the absence of any statutory prescription, the NRC has substantial latitude to structure its decision making process as it deems appropriate, noting that for this very reason, in *Minnesota v. NRC*, supra, the Court rejected the argument that a generic proceeding was impermissible because it deprived intervenors of procedures, such as cross-examination, to contest the NRC's determinations (602 F2d at 417).

Third, NUMARC believes that the NRC's proposed rule provides an appropriate level of public participation because, through the rulemaking, the NRC is permitting members of the public to participate in the development of the GEIS and to express their views at an early juncture. NUMARC points out that the NRC has provided ample opportunity for interested persons to identify any site-specific considerations that might make a generic determination applicable to a particular plant, and that the NRC has made every effort, including conducting a workshop, to solicit widespread comments from the public and governmental agencies. Furthermore, NUMARC observed that persons and agencies have been made fully aware of the NRC's generic approach and, in response, have offered criticisms of specific determinations which the NRC must address. NUMARC commented that, in fact, this rulemaking allows a national focus on the environmental effects of license renewal. Because the GEIS applies to all plants, comments have been submitted by many persons and governmental agencies who might not have been interested or expressed their views on an individual proposal. It is NUMARC's belief that this opportunity to comment further bolsters the rational basis for the rule.

Fourth, NUMARC pointed that courts have opined that for complex environmental questions, the public actually would benefit from institution of a single, conclusive rulemaking proceeding. In *Ecology Action v. AEC* (492 F.2d 998, 2d Cir. [1974]), for example, NUMARC noted that the Second Circuit stated that "the idea that licensing agency should endeavor to identify environmental issues common to many applications and handle them in 'generic' proceedings would seem to benefit all parties, particularly the poorly-financed environmental groups." NUMARC noted that in the *Ecology Action* case, the court also stated that: "A single generic proceeding may enable environmental groups, which frequently lack sufficient resources to produce experts and to prepare written submission for individual cases, to make more effective presentations."

Fifth, NUMARC pointed out that public participation will also be available in individual license renewal proceedings to address those environmental impacts that were not resolved generically. Members of the public participating in an individual licensing proceeding can litigate even

generically determined environmental issues if they can establish special circumstances justifying a waiver under 10 CFR 2.758. NUMARC noted that the procedural burden of establishing special circumstances is outweighed by the burdens which would be imposed on both the NRC and the public if the same environmental questions had to be litigated repeatedly in each individual case.

Sixth, and final, NUMARC pointed out that even if members of the public did not wish to participate in the hearing and pursue a waiver of the rule, they could submit comment letters to NRC staff regarding their view of the need for individualized treatment of one or more environmental issues. NUMARC observed that during NRC staff's consideration of a particular renewal application prior to the Licensing Board hearing, the public could submit letters to NRC staff pointing out any plant-specific circumstances, and that armed with such input, NRC staff then could decide whether to seek a Section 2.758 waiver itself. Thus, concludes NUMARC, the public retains the ability to participate through comments in a meaningful way.

Concern: NRR.022	**Comment:** 119.013	**Subtopic:** State participation
Commenter: Rasin	**Page:** 15–17	**Org:** Nuclear Management and Resources Council

NUMARC commented that the NRC's proposed rule does not interfere with State decision making, stating that: "The NRC's proposed generic approach neither supplants nor interferes with the States' traditional responsibility in the field of electric utility regulation for evaluating the need for power and the suitability of alternative energy sources." NUMARC added that: "The proposed rule and draft GEIS in no way detract from the States' authority to exercise their traditional regulatory functions." As legal justification for its position, NUMARC submitted the following. Under the AEA, States retain the power to regulate "activities for purposes other than protection against radiation hazards." Furthermore, NUMARC noted that while "the Federal government maintains complete control of the safety and 'nuclear' aspects of energy generation," the Supreme Court has stated, "the States exercise their traditional authority over the need for additional generating capacity, the type of generating facilities to be licensed, land use, ratemaking, and the like" (*Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*).

NUMARC believes that the proposed rule would not alter this division of responsibility; rather, in accordance with its consistent practice under NEPA, the NRC would consider the costs and benefits of license renewal in order to determine whether any adverse environmental impacts are outweighed by other factors. NUMARC noted, however, that this review would be for the limited purpose of conducting the environmental evaluation necessary for the NRC to decide whether to renew a Federal license, and that the proposed rule nowhere purports to preempt the States' authority to assess such issues as the need for power and the viability of alternate energy sources for purposes of issuing certificates of convenience or carrying out other traditional State regulatory functions. NUMARC asserts that the States could continue to exercise whatever legitimate State authority they may have over those functions, notwithstanding any judgments the NRC may make regarding renewal of the NRC license.

The proposed rule would not interfere with State environmental permitting decisions, such as those addressing nonradiological hazards that do not conflict with the NRC's safety requirements. Thus,

NUMARC concluded that there is no merit, therefore, to objections that the proposed rule would usurp State power or interfere with a State's independent responsibilities.

Concern: NRR.023	**Comment:** 119.014	**Subtopic:** Cumulative impacts
Commenter: Rasin	**Page:** 17–18	**Org:** Nuclear Management and Resources Council

NUMARC commented that the NRC's proposal considers cumulative impacts. NUMARC noted that the GEIS concluded, at least implicitly, that no significant environmental impact would result from the accumulation of effects for Category 1 and Category 2 issues (for plants within the defined Category 2 boundaries), and added that this could lead to the question of whether the

NRC's proposed rule will allow the NRC to consider the cumulative impact of all issues at the time it makes a decision on an individual license renewal application.

NUMARC believes that the NRC can consider the cumulative effects of all Category 1, 2, and 3 issues when it prepares an EA or decides whether to prepare an EIS on an individual application for license renewal. NUMARC noted that if the NRC decides that all the issues for a particular plant are cumulatively insignificant, it would make a finding of no significant impact (FONSI) (see 10 CFR 51.95 and proposed revision). Alternatively, NUMARC argued, if the NRC decides that all the issues for a particular plant are cumulatively significant, it would prepare a site-specific EIS.

NUMARC concluded that this approach would not result in opening up for adjudication the NRC's findings on Category 1 or 2 issues for "bounded" plants. Absent a party making the required showing of special circumstances under Section 2.758, the NRC would not reassess the GEIS's generic findings on the incremental impact of each individual issue. Rather, the NRC would only be adding the previously determined incremental impacts of Category 1 and ("bounded" plant) Category 2 issues to the impacts assessed in individual renewal proceedings for ("unbounded" plant) Category 2 and Category 3 issues. But, NUMARC added further, the NRC can and presumably would reassess the overall balance in light of the site-specific information on unbounded issues without the need to reassess the weight of the incremental impacts of Category 1 and bounded issues. NUMARC noted that the NRC can consider the cumulative impact of all environmental issues in plant-specific adjudicatory proceedings without departing from its objective of assessing most incremental impacts in the context of one conclusive rulemaking proceeding.

In sum, NUMARC does not find objectional the NRC's endeavor in the GEIS to make a tentative evaluation of the cumulative impact of all the environmental issues that were resolved generically. It believes that the NRC has the authority to generically reach a preliminary conclusion as to relative costs and benefits subject to a possible tipping of the scales in the other direction upon consideration of individualized factors.

Docket Number: 120

Concern: NEP.021 **Comment:** 120.001 **Subtopic:** Purpose of GEIS
Commenter: Gallo & Ross **Page:** 1, 8 **Org:** Law/legal firm

A law firm representing an electric utility company, commenting on the CEQ's suggestion that the GEIS be used as a tiering document, noted that the effect of this would be that the NRC would not issue the proposed regulation, but rather, the GEIS would serve only as a source document for the preparation of plant-specific EISs at the time of the renewal application. Athough the tiering process suggested by CEQ is an acceptable NEPA procedure, it does not serve the NRC's objective of establishing a stable and predictable licensing process for renewing nuclear power plant licenses and for conserving agency resources. Furthermore, using the GEIS as a tiering document would trigger the unnecessary reconsideration of environmental information because Federal, State, and local agencies, and the public would have to comment again on generic environmental infomation when site-specific EISs are circulated for comment. (See Comments 092.001 and 092.002 by the CEQ.)

Concern: NEP.004 **Comment:** 120.002 **Subtopic:** NRC/State review procedure
Commenter: Gallo & Ross **Page:** 4–6 **Org:** Law/legal firm

In a Memorandum of Law on the CEQ's comments, a law firm representing an electric utility company noted that the CEQ apparently considers the limited conclusiveness afforded generic issues by the conditional cost-benefit balance as a final consideration of those issues, and one that occurs before any decision is made on the renewal of a nuclear power plant license. While it appears that the CEQ does not question the NRC's authority to address NEPA issues by rulemaking (generically), the CEQ does contend that the approach proposed for license renewal by the NRC violates the NEPA procedural requirement that mandates agency consideration of all environmental impacts of a proposed Federal action at every step of agency decision making.

The NRC should clarify this issue and expressly state in the final GEIS and rule that when the agency renders a license renewal decision, the conditional cost-benefit balance is to be restruck in its entirety taking into account all environmental impacts and benefits, thus confirming that all impacts and benefits of the proposed action will be considered at this final step of agency decision making. Then, if this were still perceived as insufficient, the proposed rule and GEIS could be revised to eliminate any cost-benefit balance, leaving that exercise for individual consideration at the time of a pending decision to issue a renewed license. In this circumstance, the license renewal regulation would be identical conceptually to Table S-3, which was upheld as a valid rule by the U.S. Supreme Court in the *Baltimore Gas* case. The rulemaking approach proposed by the NRC would, with these suggested clarifications, meet the legal requirements of NEPA, resolve any concerns of the CEQ, and foster the stated policy objectives of the NRC.

Concern: NRR.024 **Comment:** 120.003 **Subtopic:** Public participation
Commenter: Gallo & Ross **Page:** 6–7 **Org:** Law/legal firm

A law firm representing an electric utility company noted that the CEQ objected (to the GEIS)

because it believes the limited finality accorded the generic evaluations impermissively, and in violation of NEPA, limits "public participation" (p. 4-5 of CEQ comments). NEPA does not require Federal agencies to obtain public comment or participation (42 U.S.C. Section 4332[2][c]); the requirement, rather, is to fully disclose the environmental effects of proposed agency action, to provide an opportunity to appropriate Federal, State, and local agencies to comment, and to disclose both the environmental information and any agency comments to the public (see *Scientists' Institute for Public Information* at 1091). The NRC, consistent with its own regulations in 10 CFR 50.73 and 50.74, provided ample opportunity for public comment and participation.

Amplifying still further on this comment, the firm commented that it is their understanding that when a particular application for the renewal of a power plant license is being considered, the NRC intends to conduct an EA of the proposed action, which would take into account the generic and site-specific environmental impacts and benefits. If that analysis indicates significant or potentially significant environmental impacts, an EIS would be prepared. If, on the other hand, the evaluation indicates no significant impact, a final cost-benefit balance would be struck in the EA. The firm assumed that the NRC would then render a preliminary FONSI and seek comments from interested Federal, State, and local agencies, and the public (they think the NRC should clarify this point—see Comment 120.002). Whether by site-specific EIS or EA, the public would be the beneficiary of this further disclosure and opportunity to comment.

Docket Number: A113

Concern: NEP.005	**Comment:** A113.001	**Subtopic:** Public participation/site-specific EISs
Commenter: Zenick	**Page:** 2–3	**Org:** Deerfield River Compact

A regional agency believes that a generic approach to the EIA of relicensing of nuclear power plants is unacceptable because the NRC's "nuclear licensing process should require a comprehensive EIS, prepared on a site-specific basis."

Concern: ALT.001	**Comment:** A113.002	**Subtopic:** Categorization of issues
Commenter: Zenick	**Page:** 3	**Org:** Deerfield River Compact

A regional agency believes that an EIA needs to be done for each plant. In addition, alternatives to license renewal need to be explored for each facility, taking into account site-specific issues.

Concern: POA.009	**Comment:** A113.003	**Subtopic:** Categorization of issues
Commenter: Zenick	**Page:** 3	**Org:** Deerfield River Compact

A regional agency expressed concern that evacuation plans are not addressed in the GEIS section dealing with postulated accidents. This is of particular concern to the towns in western Franklin County, Massachusetts.

Concern: GIS.016 **Comment:** A113.004 **Subtopic:** Rulemaking & GEIS approach
Commenter: Zenick **Page:** 4 **Org:** Deerfield River Compact

A regional agency pointed out that several site-specific issues are not included in the GEIS (e.g., plant operating history, seismic risks, adjacent site hazards, economically valuable fisheries and recreation areas in the Deerfield River and surrounding countryside, and radiological impacts on micro-climatic, surface terrestrial and groundwater pathways.)

Concern: SWM.021 **Comment:** A113.005 **Subtopic:** Uranium fuel cycle
Commenter: Zenick **Page:** 4 **Org:** Deerfield River Compact

A regional agency noted that issues rejected in the GEIS include analyses of extended fuel-cycle activities and the environmental impacts of the uranium mining and milling required to produce the fuel for an additional 20 years of operation.

Concern: NRR.001 **Comment:** A113.006 **Subtopic:** Waste disposal
Commenter: Zenick **Page:** 4 **Org:** Deerfield River Compact

A regional agency notes that 1) the nuclear industry has not been able to demonstrate that either the technology or acceptable long-term storage sites exist for the spent fuel, refurbishment wastes and LLW that will accumulate from an additional 20 years of operation, and 2) the States are experiencing difficulty siting even LLW storage sites.

Concern: GIS.007 **Comment:** A113.007 **Subtopic:** Cost-benefit analysis
Commenter: Zenick **Page:** 4 **Org:** Deerfield River Compact

A regional agency argues that accurate cost-benefit conclusions cannot be drawn about the merits of an additional 20 years operation until the relicensing assessment includes an analysis of all costs of nuclear generating facilities, i.e., the fuel production, plant, liability, and waste disposal costs.

Docket Number: 501

Concern: GIS.008 **Comment:** 501.001 **Subtopic:** Corrections
Commenter: Janes **Page:** 1 **Org:** Risk Analysis Corporation

An engineering consulting firm noted that in the GEIS, page 4-53, line 7 and page 4-124, line 5, the name should be spelled Janes and not James.

Concern: GIS.008 **Comment:** 501.002 **Subtopic:** Corrections
Commenter: Janes **Page:** 1 **Org:** Risk Analysis Corporation

An engineering consulting firm noted that in the GEIS on page 4-56, line 40, the correct reference to Chapter 7 for Easterly is probably ORNL/TM-11728 by Easterly et al., rather than Easterly's article in the *American Journal of Epidemiology*.

Concern: GIS.008 **Comment:** 501.003 **Subtopic:** Corrections
Commenter: Janes **Page:** 1 **Org:** Risk Analysis Corporation

An engineering consulting firm noted that in the GEIS on page 4-57, line 35, the units in the denominator of the expression "10 to 100mA/Cm^2" should be m^2 (meters squared). The threshold current density for direct stimulation of nervous tissue is on the order of 0.1 mA/cm^2 (1 A/m^2). A current density of 1 mA/m^2 (10 Am/^2) is above the threshold for fibrillation in dogs.

Concern: HHI.015 **Comment:** 501.004 **Subtopic:** Electromagnetic fields impacts
Commenter: Janes **Page:** 2 **Org:** Risk Analysis Corporation

An engineering consulting firm referred to a statement in the GEIS on page 4-59, line 17 et seq.: "If and when there is a Federal law limiting human exposures to electric and magnetic fields, the EPA will promulgate the regulation." To commenter's knowledge, the EPA has no legislative authority to set standards for exposure to power frequency electric and magnetic fields. The EPA could use the authority it inherited from the Federal Radiation Council, 42 U.S.C. 2021(h) to provide guidance to other Federal agencies. This section of the code reads: "The Administration shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States." The EPA has used this statute for this purpose before, for example, in the case of radon exposure of uranium miners. Each Federal agency, however, would have to implement the guidance; the EPA has no direct implementing role. Likewise, the Health and Human Services (HHS) could invoke the Radiation Control for Health and Safety Act and treat transmission lines as "electronic products", and write performance standards for the lines analogous to the leakage standards for microwave ovens. However, the HHS has historically deferred to other Federal agencies, such as the EPA and the Federal Communications Commission, to take the lead for regulation of environmental sources of nonionizing radiations.

Concern: HHI.010 **Comment:** 501.005 **Subtopic:** Electromagnetic fields impacts
Commenter: Janes **Page:** 2 **Org:** Risk Analysis Corporation

An engineering consulting firm is concerned that neither the private sector nor the Federal government is moving quickly to establish standards for the control of public exposure to power frequency electric and magnetic fields. There are no occupational standards in this area, and the Federal policy which exists is uneven. In implementing their NEPA responsibilities, Federal agencies require compliance with the National Electric Safety Code and with State standards, if

any. Currently seven States have standards for electric fields, and one has standards for magnetic fields. The NRC in its draft EIS has decided that applicants need not address the issue of chronic effects of EMF in license renewal applications. However, other agencies have acted on this issue. For example, the Bonneville Power Administration has announced a policy of avoiding increases in long-term involuntary exposures if practical alternatives exist, and it has a moratorium on the construction of structures on the ROW such as basketball backstops and picnic tables that tend to increase exposure. The FERC states that transmission lines should be sited as far as practicable from residences and schools, and recommends that conductor spacing and placement be designed to minimize EMF effects. Moreover, the Rural Electrification Administration has concluded "that there is sufficient evidence to indicate that the possibility of a casual (sic) link between the presence of electric power lines and the increased risk of childhood cancers can not be dismissed."

B-3. Summary of Comments Made at the Regional Meetings on the NRC's Discussion Paper (February 9-17, 1994)

First Public Meeting on State Concerns (Part 51)
Rockville, MD—February 9, 1994

Comment Summaries
Docket Number: PM1

Comment: PM1.001
Commenter: R. Ng

Page: 11; 48; 67–71; 131
Org: Nuclear Management and Resources Council (now the Nuclear Energy Institute)

The commenter indicated that NUMARC (now the Nuclear Energy Institute [NEI]) is recommending another option in which the NRC would not consider the issues of need for power and alternatives as part of its environmental impact assessments. NUMARC believes that the NRC can still fulfill its NEPA obligation even if it does not consider these issues.

Comment: PM1.002
Commenter: E. Ginsburg

Page: 11–12; 76
Org: Nuclear Management and Resources Council (now the NEI)

Responding to a question from NRC staff on the rationale behind NUMARC's proposed option, the commenter indicated that the NRC is responsible for licensing and the major Federal action would be described as granting or not granting a license. The description of the scope of a Federal action would determine what, if any, alternatives would have to be considered.

Comment: PM1.003
Commenter: C. Gray

Page: 30–31; 38
Org: National Association of Regulatory Utility Commissioners

The commenter indicated that the electric utility industry is now undergoing structural changes and the activities going on at the Federal Energy Regulatory Commission (FERC) and in individual State public utility commissions will affect how States see the question of need [for power]. The relicensing of existing plants is going to be central to the debate. There are also a series of new regulatory tools, including integrated resource planning (IRP) and least cost planning (LCP), that have changed the way public utility commissions see their responsibility to protect the ratepayer's interest and the environmental impact of utility operations. What States are learning through their own processes is that the questions of need and alternatives are utility-specific and are changing. The States are concerned that they not be Category 1 issues.

Comment: PM1.004
Commenter: C. Gray

Page: 36
Org: National Association of Regulatory Utility Commissioners

With regard to the NRC/EPA/CEQ agreement on changes that are being made to the GEIS and proposed rule, the commenter believes that some of the procedural concerns that the States have

are addressed by this agreement. (He indicated that the States' representatives could clarify this further at the forthcoming public meetings.)

Comment: PM1.005
Commenter: E. Ginsburg

Page: 39
Org: Nuclear Management and Resources Council (now the NEI)

In response to a comment about the prejudicial nature of the NRC's decision on the issues of need and alternatives, the commenter noted that under the law the State has final authority on the issues of economic regulation. Hence, the NRC's determination has no legal binding on the State's determination on those issues.

Comment: PM1.006
Commenter: C. Gray

Page: 40–43; 56
Org: National Association of Regulatory Utility Commissioners

With regard to the characterization of States' major concerns on the treatment of need and alternatives as one of preemption of their authorities, the commenter agreed with a NUMARC representative that States have final authority on issues of economic regulation; hence, there is no preemptive effect. The States' concern may be stated better as "encroachment or influence" which means that the NRC's decision could affect the State's decision making process and reduce the flexibility they would have in their own proceedings.

Comment: PM1.007
Commenter: C. Gray

Page: 49–51
Org: National Association of Regulatory Utility Commissioners

With respect to an NRC staff question of whether changing the statement in the proposed rule regarding the finding on need (as need for power instead of need for the license renewal of an individual nuclear plant) would satisfy the States' concern regarding preemption, the commenter thought that such a change "would probably provide greater comfort to the States."

Comment: PM1.008
Commenter: E. Ginsburg

Page: 51–52
Org: Nuclear Management and Resources Council (now the NEI)

The commenter noted that the separation of States' and the NRC's determinations on need and alternatives has nothing to do with any of the options. If the NRC chooses to look at these issues, it would be for the purpose of resolving its requirements under NEPA. The purpose for which the State would look at these issues is to determine whether it would allow the utility to continue operating [the plant].

Comment: PM1.009
Commenter: D. Lewis

Page: 53
Org: Shaw, Pittman, Potts & Trowbridge

The commenter stated that the NRC can satisfy the NEPA requirements by changing the language in the GEIS to say that there is a need for power because of the general need for electricity in regions, and therefore, there is a benefit to license renewal. That does not mean it is the best [alternative], nor does it mean that there may not be different State determinations based on LCP. The NRC can have generic findings in the GEIS to make those minimal NEPA findings of a benefit and no clearly environmentally superior alternative as a matter of presumption.

Comment: PM1.010
Commenter: C. Gray

Page: 55
Org: National Association of Regulatory Utility Commissioners

The commenter indicated that a lot of States would be glad to see the NRC include in the rule a statement indicating that the law is that States' regulatory authority shall not be preempted.

Comment: PM1.011
Commenter: R. Ng

Page: 73
Org: Nuclear Management and Resources Council (now the NEI)

In response to an NRC staff's question on what is the difference between NUMARC's proposed option and the NRC's Option 4, the commenter said that the principal difference is that in Option 4 an analysis of alternatives will still be made for disclosure purposes, while NUMARC is advocating that no analysis be perfomed.

Comment: PM1.012
Commenter: E. Ginsburg

Page: 74
Org: Nuclear Management and Resources Council (now the NEI)

Regarding NUMARC's position for not presenting any analysis of need and alternatives in the GEIS, the commenter explained that the court (i.e., Calvert Cliffs case) found it unacceptable to present a NEPA analysis and not allow its review because this essentially emasculates the purpose for which the analysis was done. NUMARC's proposed position can be supported by defining the scope of the Federal action (See Comment PM1.002).

Comment: PM1.013
Commenter: C. Gray

Page: 82–91
Org: National Association of Regulatory Utility Commissioners

The commenter indicated that he does not understand the difference between Option 1 and the NRC's original proposal (re: treatment of need and alternatives). He also questioned how the three circumstances (i.e., inadequate need for generating capacity, environmentally preferred alternative, and significant cumulative adverse environmental impacts) addressed in Option 1,

which could result in consideration of direct economic costs and benefits, could become apparent to the NRC. (Although the NRC indicated that these circumstances will be determined during the process of developing the environmental impact statement (EIS), subsequent discussions by other NRC staff and other commenters suggest that under this option, if the issue of need is designated as Category 1 in the GEIS, there may not be an opportunity to make a finding of inadequate need for generating capacity on a site-specific basis unless new and significant information is presented during the license renewal proceeding.)

Comment: PM1.014 **Page:** 88–89; 95–96
Commenter: J. Gallo **Org:** Gallo and Ross

The commenter indicated that if the issues of need and alternatives are designated Category 1 in the GEIS, then such designation would be inconsistent with Option 1 because there is no mechanism for NRC staff to determine on a site-specific level what the applicant has to say about need or alternatives. He does not see any difference between Option 1 and the NRC's current approach.

Comment: PM1.015 **Page:** 94
Commenter: E. Ginsburg **Org:** Nuclear Management and Resources Council (now the NEI)

The commenter does not see how Options 1 and 3 address the States' concerns about encroachment of their traditional regulatory responsibility.

Comment: PM1.016 **Page:** 99–100
Commenter: C. Gray **Org:** National Association of Regulatory Utility Commissioners

With regard to Option 2, NRC staff asked whether States have legal concerns or see problems if the NRC accepts a State's conclusions with respect to the issues of need and alternatives. The commenter indicated that he does not see any legal problem at the State level. However, not all States make these findings although over time as the IRP process expands, more States will be in a position to provide more rigorous and sophisticated analysis that the NRC could use.

Comment: PM1.017 **Page:** 101–102
Commenter: C. Gray **Org:** National Association of Regulatory Utility Commissioners

On Option 2, the NRC raised a question about the major features of guidelines for State determinations and analyses of need and alternatives. The commenter indicated that States have experience in developing guidelines, but not all States may have the authority under State law to develop or implement guidelines.

Comment: PM1.018
Commenter: E. Ginsburg

Page: 102–103; 131–132
Org: Nuclear Management and Resources Council (now the NEI)

The commenter indicated that NUMARC is concerned that Option 2 makes the NRC's [license renewal] proceeding dependent on the State's actions. It also puts the State in a position of having the NRC review and potentially litigate the State's analysis. The commenter also reiterated the industry's view that the application for license renewal is a piece of information for the utility to consider in the context to making a decision to pursue operation beyond 40 years.

Comment: PM1.019
Commenter: D. Lewis

Page: 104
Org: Shaw, Pittman, Potts & Trowbridge

The commenter believes that it would be difficult to do the State determination first. The NRC determination [on license renewal] will identify the necessary modifications, capital investment, and the level of increased operation and maintenance. If a State least-cost analysis is done first, it will be done without that information.

Comment: PM1.020
Commenter: C. Gray

Page: 119–121
Org: National Association of Regulatory Utility Commissioners

With regard to Option 4, the NRC asked whether States have legal concerns or see problems if the NRC treats the issues of need and alternatives for disclosure purposes only, and to what extent this option resolves States' concerns. The commenter indicated that, if States have to choose among the four options, they would prefer Option 4. He also suggested that the NRC conduct a pilot investigation with States that have the most sophisticated IRP processes to put Option 2 to a test.

Comment: PM1.021
Commenter: D. Lewis

Page: 121–122
Org: Shaw, Pittman, Potts & Trowbridge

The commenter stated that whichever option is selected, the NRC has weakened its defense of that option by having agreed with the EPA and the CEQ to prepare a supplemental EIS (SEIS) for all license renewal applications. The concern about providing a more formal public comment process can be addressed by issuing a draft environmental assessment (EA) for comment.

Comment: PM1.022
Commenter: E. Ginsburg

Page: 123–124
Org: Nuclear Management and Resources Council (now the NEI)

The commenter stated that retaining the option to prepare a supplemental EA instead of an EIS provides flexibility, and observed that NRC staff's explanation for the change in the NRC's approach is a predetermination that all Category 2 and 3 issues will have substantial environmental impacts; hence, an EIS will inevitably be perfomed.

Comment: PM1.023
Commenter: H. Fontecilla

Page: 126
Org: Virginia Power

The commenter indicated that the public should have been given the opportunity to participate in how the agreement [between the NRC, the EPA, and the CEQ] was reached. (NRC staff noted that the NRC/EPA/CEQ agreement was a conditional one and the NRC reserved the right to go forward with the proposed rule in its existing form.)

Second NRC Public Meeting on State Concerns (Part 51)
Rosemont, IL—February 15, 1994

Comment Summaries
Docket Number: PM2

Comment: PM2.001
Commenter: Ray Ng

Page: 22–3; 123; 191–5
Org: Nuclear Management and Resources Council (now the NEI)

Commenter made the following points: (1) utilities seeking to renew their nuclear plant licenses will do so as part of a larger decision making process related to meeting energy needs and ensuring reliable and efficient delivery of electricity; (2) industry endorses the NRC's generic approach because most of the environmental impacts associated with license renewal are common to all or almost all operating plants, and considering those common impacts only once is a significantly more efficient use of licensee and public resources; (3) advanced timing by the NRC on license renewal would allow utilities to obtain a decision from the NRC several years before a license is to expire, and to perform more definitive planning; (4) industry does not believe that generic evaluations either supplant or bind the States on these issues (in fact, it is well settled that regulation of these issues is solely within a State's jurisdiction); (5) as noted in NUMARC's comments submitted two years ago, the industry believes that the NRC can fulfill its obligations under NEPA even if it does not consider need and alternatives; and (6) from a practical standpoint, something like Option 2 would be very difficult to implement.

Comment: PM2.002
Commenter: M. McCarthy

Page: 23; 42–3; 44; 51–2; 197–8
Org: Minnesota Department of Public Service

Commenter noted that the State of Minnesota raised many questions regarding technical inadequacies, which are beyond the scope of the public meeting; however, Minnesota wants to reiterate its desire to have those inadequacies met. The State is still very concerned about the whole approach and purpose of the GEIS, and codifying it as a rule. Its concerns relating to need and alternatives are nested within that general concern.

Minnesota is concerned about the purpose of the rule and the amount of time and money spent on the whole proceeding. The NRC's own cost findings identified a total savings of about $7 million to $26 million for the total rulemaking exercise, yet the proceedings have been running for several years already. Minnesota is beginning to become concerned that this whole exercise has been negligible or perhaps even a negative cost-benefit. The States, industry, and the NRC have put a fair amount of effort into streamlining the relicensing process.

Commenter pointed out that on the technical inadequacies, Minnesota's concerns are neither separate from their comments on the CEQ/EPA agreements, nor from their later comments and options. If inadequacies, particularly in the need and alternatives sections of the draft GEIS, are not remedied and the CEQ/EPA agreements are implemented, then Minnesota is left in a position where it can no longer raise these technical inadequacies because they are no longer new

information, and it would have to reinitiate some type of a rulemaking procedure or a petition for waiver to get these things fixed later.

Commenter responded to a question from NRC staff (Regarding Table B-1 of the Rule, if the NRC was to back off from implying that license renewal is needed and state merely the need for power, not making any judgments as to the type of power or where it has to come from, do the States see this distinction as meaningful?) by noting that the rule, and many parts of the rule—specifically need and alternatives—are based on what Minnesota believes is a faulty assumption of gradual and predictable change in the technologies for generation and power use.

In response to another question from NRC staff—that the States give insight into the benefit of completely dropping the rule—commenter stated that Minnesota's comments are predicated on the desired option of dropping the rule since it is fraught with difficult-to-defend assumptions, and there are many problems underlying the fundamental approaches to generically addressing the issues and codifying them as a rule. The most streamlined solution may be to drop what is on the table and to reissue something much simpler and narrower in scope.

Comment: PM2.003 **Page:** 24; 66; 105–6; 140–1; 205–6
Commenter: M. McCarthy **Org:** Minnesota Department of Public Service

Commenter addressed three points: (1) despite different legal approaches, there appears to be consensus that the wise thing to do is to defer to the State processes and expertise, as many of the States are already implementing review processes that look at needed alternatives on an ongoing basis; (2) need and alternatives should be determined at the time of application (it may be unwise to pursue these types of determinations many years and perhaps several decades in advance); and (3) Minnesota would like to see some type of explicit statement in the body of the rule itself that defines what the State authority is and helps clarify perceived encroachment (at a minimum, a statement [of nonpreemption] would have to appear within the context of the rule).

Commenter indicated that a similar outcome to relying on a State process would be a series of "and" statements: if the State gets an explicit statement that it is not being encroached upon in its traditional authority and there is a statement of reliance upon State processes and the process [specified by the NRC] provides the equivalent function of the operating license exclusion and if the other technical fixes recommended by Minnesota occur . . . He believes that this will result in the NRC not having a duplicative and problem-causing procedure.

Comment: PM2.004 **Page:** 25–7; 68–70; 71–2
Commenter: A. Visnesky **Org:** Illinois Commerce Commission

Commenter believes that it is very important to address the issue of perceived encroachment or preemption of legal authority and to "operationalize" it. He thinks it is extremely important to realize that, whether there is a de facto legal preemption, or merely a perception of encroachment, what the States end up dealing with is a situation that is probably best described as the worst of all possible worlds. A license renewal application that has been approved by the NRC carries a lot of weight in district courts in Illinois. It is a two-fold problem: (1) it shifts the burden to State staff members to refute utilities' assertion that the NRC's determination of need and

economic benefit is sufficient; and (2) if the utility does not have an acceptable plan, Illinois Commerce Commission (ICC) is required to substitute a plan or to modify that plan. Practically speaking, when these get challenged, the courts use a process of weighing evidence that gives the best grade to the best looking cover and the one that has the heaviest volume.

Comment: PM2.005 **Page:** 27–28
Commenter: D. Kraft **Org:** Nuclear Energy Information Service

Commenter, identifying himself as representing some of the opinions of environmental groups nationwide, indicated that the recent historical record proves some of the fatal flaws in the notion of a GEIS. The environmental community is concerned with the entire GEIS process and concept applied to plant life extension (it is very difficult to project 20 years in advance, even 5 years in advance). Examination of NEPA not only puts the NRC in the bind of having to discuss need and alternatives, but NEPA also orders the NRC to take a look at the recoverability of resources, which is another economic issue. There does seem to be some precedent in the radioactive waste area where the NRC has granted the States a good deal of latitude through the Agreement State process. Maybe an arrangement could be set up where the States would, in essence, drive the economic argument and the NRC would comply with that.

Comment: PM2.006 **Page:** 28–29; 104–5
Commenter: M. Amy **Org:** Public Service Commission of Wisconsin

Commenter noted that the Public Service Commission of Wisconsin's (PSCW's) comments largely mirror those voiced by Minnesota (see Comment PM2.003). Wisconsin has a fairly extensive process for doing IRP to address the questions of alternatives and need, and commenter thinks that the States' expertise in this area should be used. Because things do change fairly rapidly, Wisconsin supports making need and alternatives Category 3 items. Wisconsin is also concerned about the perceived encroachment on State authority. Regarding this latter point, commenter asked if it was correct to assume that a statement recognizing the State's authority to determine need and alternatives would go into the body of the rule. Finally, Wisconsin suggests that Option 4, which leaves the determination of need and alternatives to the States, would be an appropriate course of action.

Comment: PM2.007 **Page:** 30
Commenter: B. Ross **Org:** Citizens Utility Board

Commenter supports many of the points made by the States of Minnesota, Wisconsin, and Illinois. Introducing a process years before the time of resource choice will just make the debate more problematic, introduce all kinds of legal problems, and lessen the cost-effectiveness of meeting the resource needs of the State.

Comment: PM2.008
Commenter: R. Callen

Page: 30–1; 81–2; 185–6
Org: Michigan Public Service Commission

Commenter noted that one of the things that has happened in a dramatic fashion over the last years has been the advent of long-range planning, more recently identified as IRP. Many States have adopted IRP. The issue has taken on greater importance with Congress' passage of the Energy Policy Act, which contains a very strong encouragement to the States to adopt IRP, or to defend themselves to the contrary. This is something that should be reflected in the NRC's thinking in response to NEPA.

Commenter believes that in reviewing need and alternatives, the NRC should make very general findings and defer to the States because the State review would be thorough, timely, and expert (e.g., pursue demand forecasting unavailable to the NRC); non-duplicative; and in confomance with the Energy Policy Act. Commenter also noted that the Energy Policy Act gives the State the authority to reject IRP (as Federally-mandated) and to define its own review process.

Comment: PM2.009
Commenter: A. Visnesky

Page: 45–46
Org: Illinois Commerce Commission

Commenter noted that the NRC Staff Discussion Paper characterizes determinations of need and economic benefit as being made differently for existing plants than they are for new plants. However, for Illinois there is essentially no difference. Illinois' LCP rules require need to be shown even to recover capacity from existing plants, and that the least cost means of achieving the need for new capacity be laid against all other alternatives.

Commenter also believes that it is important to look at the determination of a threshold economic benefit for determination of need. In 1992, the Oak Ridge figures indicated a range of between $450 and $650 per KW for the cost of recovering capacity from relicensed plants. That figure is right in the middle of the peak costs in Illinois. Illinois has a statutory obligation to approve the plan that has the lowest cost, not just below a threshold cost.

Comment: PM2.010
Commenter: M. McCarthy

Page: 46; 47
Org: Minnesota Department of Public Service

Commenter noted that they (in Minnesota) have questions and concerns about the 5-year as opposed to 20-year renewal basis. It would clearly raise an additional and perhaps repetitive administrative process. Minnesota is concerned with this because the purpose of what the NRC is trying to do is to lessen the administrative burden.

Comment: PM2.011
Commenter: M. Amy

Page: 47–49
Org: Public Service Commission of Wisconsin

Commenter noted that Wisconsin's comments on the GEIS in 1992 contained several concerns about how the economic analysis was done, as well as the review of alternatives, and Wisconsin still has those concerns and hopes they will be addressed.

As far as the question of what the fundamental issue is, Wisconsin is very concerned about minimizing the cost of providing electric service to Wisconsin customers. Wisconsin has long-term planning every three years because it recognizes that infomation and situations change. Following planning and before anything is constructed, Wisconsin goes through an additional construction review where need is determined finally. To bring something to construction review, the need has to be determined on a planning level in a previous planning proceeding. This ensures that the long-term view of the future reflects the most current infomation. This is an important point to make because this is the extreme opposite of freezing the view on need and alternatives at an early stage. Essentially what Wisconsin has is a continuous process for evaluating the cost of alternatives and when decisions are needed, and these decisions are made by the State in a timely way and have resulted in lower customer costs because of this process.

Commenter also mentioned events that are occurring now which lead to uncertainty. One is the change in the utility industry in terms of the amount of competition. This creates an unknown factor that is likely to affect the price of energy in the future. Others are the participation of cogenerators and the generation market, and the opening up of transmission systems to transfers through the Energy Policy Act—all of these things lead to a lot of changes. Anything that does not recognize this and defer the decision on need and alternatives to the last possible point in time is likely to result in higher costs for customers.

Comment: PM2.012 **Page:** 49
Commenter: S. Jenkins **Org:** Public Service Commission of Wisconsin

Commenter indicated that Wisconsin's process, both at the planning and very definitely at the construction stage, involves looking at the environmental impacts of the choices (see PM2.011).

Comment: PM2.013 **Page:** 55; 143
Commenter: B. Ross **Org:** Citizens Utility Board

Commenter responded to a question from NRC staff by saying that any kind of Federal blessing that is given to capacity may be used as evidence regardless of the NRC's intent. They have problems with the NRC putting its stamp on the State commission's work if the NRC was not involved in the State's planning process. He does not necessarily see [NRC's involvement] as contributing to the process other than easily satisfying NRC's NEPA requirements.

Comment: PM2.014 **Page:** 57
Commenter: D. Hahn **Org:** Michigan Department of Public Health

Commenter asked whether a proposed need would be sufficient (reasonable) or would the NRC have to prove need without a doubt.

Comment: PM2.015
Commenter: M. McCarthy

Page: 60; 62
Org: Minnesota Department of Public Service

In responding to a question posed by NRC staff—to what extent the concerns of the States are resolved by the changes to the GEIS and rules being made in response to CEQ and EPA comments—commenter reemphasized that, especially for need and alternatives, if these issues are not addressed now, the CEQ/EPA agreements do not account for that being done later. Minnesota believes that that is a vitally important consideration. Most of the fixes in the CEQ/EPA agreements are geared toward what would be Category 3 issues, and presume that unresolved issues would get attention in the EIS. So by themselves in isolation, these agreements do not go very far; however, in combination with the redesignation of categories for specific issues, these become more significant (See Comment PM2.002).

Comment: PM2.016
Commenter: S. Jenkins

Page: 60–61
Org: Public Service Commission of Wisconsin

Commenter responded to a question from NRC staff (see Comment PM2.015) by noting that if you go this route, the option in terms of handling need and alternatives for States that have little NEPAs, as Wisconsin does, is that the Wisconsin code allows the State to enter into an agreement with the Federal government so that there is a joint SEIS, where Wisconsin does the part of the work where it has the most expertise in and the Federal government does the part where it has the most expertise. (Commenter further noted that although this provision is in the Wisconsin code, they have never carried out such an arrangement completely. She further implied that there would be problems with this mode of operation.)

Comment: PM2.017
Commenter: M. Amy

Page: 64; 66; 78
Org: Public Service Commission of Wisconsin

Commenter noted that the CEQ/EPA agreements appear to move issues toward being Category 3, which they support; however, it is not clear to him what this means relative to actually having the items as Category 3 issues, and what the reason(s) are for not simply making them Category 3 issues. If need and alternatives were designated as Category 3 items, by the time you get to the point where you have to make these decisions, a State could have acted to develop the planning basis that it would provide to the NRC to support a decision. That would allow the States to mesh their activities with the NRC's rather than working at odds with the NRC. He also commented that if need and alternatives are not designated as Category 3 issues, timing problems would result. Finally, he added that redesignating [need and alternatives] as Category 3 would help, but is not the whole answer, as it leaves open other questions raised earlier about State authority.

Comment: PM2.018
Commenter: M. Amy

Page: 70; 72; 76–7
Org: Public Service Commission of Wisconsin

Commenter supported Illinois's comment (see Comment PM2.004). He added that [refuting utilities' assertion that the NRC's determination is sufficient] is a burden for State commission

staff members because their position in that case will always be second to the utility's and necessarily a difficult position to support. He observed that one side of this issue, where the utility has a previously-approved NRC decision, is the analytical side. It is also important to recognize that almost anything that is done by the NRC is likely to be presented in arguments in court that NRC's jurisdiction preempts the State. Wisconsin has been sued on exactly these grounds of exceeding its jurisdiction in this area. Wisconsin supports Option 4 because it believes that it clearly defines that it is the States who make the decisions on need and alternatives. Since the NRC does not address need and alternatives under Option 4, it will be much harder to allege that the State has been preempted.

Comment: PM2.019 **Page:** 72–3; 146–7
Commenter: M. McCarthy **Org:** Minnesota Department of Public Service

Commenter thinks the two philosophical questions the participants are wrestling with are duplication and potential conflict. It is desirable to avoid both. There is little upside that the States can perceive from the NRC conducting an analysis of need and alternatives. There is significant downside. As a reference, he called attention to 40 CFR 1506.2, Parts B and D that address the issues of redundancy and potential conflict. It is his contention that NEPA recognizes the wisdom of avoiding unnecessary duplication of what is already being done by the States, and that there is a very explicit suggestion that State plans and activities already underway have deference whether or not they are Federally-approved. In order to avoid duplication and potentially conflicting outcomes with all the associated litigation and administrative burdens, commenter suggests that all interests are best met by creating reliance on a local decision making process.

Comment: PM2.020 **Page:** 78; 116–8; 120–1
Commenter: A. Visnesky **Org:** Illinois Commerce Commission

Commenter suggested that the NRC either use or wait until a finding by a State commission that capacity is needed before entering into the relicensing process. He believes that the NRC could meet its requirement by affirming that a need for power exists and one possible option for fulfilling that need would be relicensing nuclear plants and maintaining capacity from them.

Comment: PM2.021 **Page:** 78–9; 86; 87–8; 94–5; 97; 116; 132–4; 155–6;166–7; 175; 177–8
Commenter: M. McCarthy **Org:** Minnesota Department of Public Service

Commenter's positions on the options are as follows:

Option 1: To the extent that Option 1 continues the same fundamental approach as in the original draft proposal, Minnesota has the same concerns as expressed in its original filing. This approach is clearly unwise and fraught with multiple hazards. Option 1 fails to meet any of Minnesota's three fundamental points (see Comment PM2.003).

Option 2: In response to a question by NRC staff (What guidelines might the NRC use in

Option 2 in order to effectively defer to the States and not take need and alternatives into consideration?), commenter noted that Wisconsin has done a particularly good job on IRP, and suggested it as a foundation for work to be done. Although he did not know what the procedure was [for implementation of IRP under the Energy Policy Act of 1992] during the transition period, he indicated that Minnesota concurred that IRP is the place to start and foundation on which to build. Commenter believes that a fairly typical State model is that State processes and long-range planning are based on a 10-15 year process with reevaluation every other year, or every two-to-three years.

In response to a second question by NRC staff (To what extent does Option 2 resolve the concerns of the States?), commenter reiterated Minnesota's concern with the big picture (see Comment PM2.003).

Option 3: In Option 3, there is an attempt to separate the consideration of need from the consideration of alternatives. Since State processes typically look at need and alternatives jointly and look at economic and environmental issues jointly as well, commenter believes that to separate them is a very peculiar approach. In addition, he believes that the assumption that that quantity of capacity will be needed at that location at all points in time during which this rule would be applied is a very difficult assumption to defend. He referenced earlier comments made regarding modeling and the other technical inadequacies that Minnesota identified in its March 1992 filing.

Option 4: Option 4, in conjunction with many of the other things also discussed earlier in terms of clarifying State authority and other components, comes fairly close to meeting Minnesota's concerns, assuming that the NRC has a legal obligation (and commenter recognizes that that is still an outstanding question). Minnesota would prefer to see deference to the States, recognizing that they already have processes in place, such as IRP, as described in the Energy Policy Act of 1992, that would provide a thorough and timely analysis of need and alternatives. Regardless of whether it is called Option 2 as modified by discussion, or Option 4, the unifying theme beginning to get repeated is that as long as there is a credible process in place, then the [NEPA] obligation is fulfilled. However, he is still concerned because Option 4 contains a redundant process in that the NRC also does an analysis because of the disclosure requirement.

Commenter directed a question to the EPA: If the NRC found a State IRP process to be a full and thorough evaluation of the issues of need and alternatives [and established that process as the guidelines], would the EPA consider that to be an appropriate process? (The EPA responded that they would address this question in their comments.)

Commenter responded to a question posed by an Oak Ridge National Laboratory (ORNL) representative (The States were concerned about the NRC doing an independent analysis of need and alternatives; however, Option 4 calls for that both at the generic and site-specific levels. Why is it acceptable to the States in Option 4 and not in some of the other options?), by stating that Minnesota's desire is to avoid a duplicate effort and Option 4 may be the best way to do this.

Finally, the way the NRC Staff Discussion Paper was written, it was easy to misconstrue what was actually set forth in Options 3 and 4, and commenter was not confident that what NRC staff was proposing in Option 4 was actually consistent with reliance on a State process. He objected to a fuzzing of the distinction between the option choices.

Comment: PM2.022
Commenter: D. Lewis

Page: 80–81; 188–189
Org: Shaw, Pittman, Potts & Trowbridge

Commenter questioned whether there is a conflict between the States' concern that the NRC not infringe on their decision making authority, and the redesignation of need for power and alternatives as Category 3 issues. It seems to him that, if these issues are Category 3 issues, that implies that there will be a site-specific determination that the capacity represented by a particular plant is needed and that there are not better alternatives. He does not believe that a State analysis can be the end point under NEPA; States should consider this in looking at the options. If the NRC adopts a State analysis, he believes that that should be just a beginning point and that the NRC would still have to consider public comments on that analysis. And if the NRC is really taking a hard look at the issues, it would have to carry that forward and make a decision to resolve public comments.

There is also case law which indicates that when an issue is part of the NRC's substantive decision making, the NRC cannot exclude that issue from its public hearing or before the Atomic Safety and Licensing Board (ASLB). This means that if the NRC takes the State's decision and says this is its NEPA position, it cannot then insulate that decision from adjudication before the ASLB and eventual review. Commenter noted that a State's position could be rejected in an adjudicatory proceeding. The States might well be better suited by a generic finding or presumption that, as a general matter, the capacity represented by existing plants is beneficial or needed and that there are not any, as a presumption, totally environmentally superior alternatives. With those sort of generic findings, specific issues represented by plants would not be addressed and adjudicatory proceedings might have less intrusive effect. He also suggested that if the States are trying to avoid NRC review and second-guessing of a State decision, they are better off coming up with a rationale as to why these issues do not have to be looked at by the NRC in the first instance.

Finally, commenter noted that there may be issues of need and alternatives that go beyond the State's review. It may be the case that even if the State determined that a particular plant was not needed for a service area, that an applicant might be able to justify need or value for the plant in the wholesale market. Therefore, it is very hard to say that the State's determination ends the issue absolutely.

(Note: Although this commenter's name appears as Wilson in the Transcript here and on pages 98–99, his comment on pages 188–189 and the question posed to him on page 201 indicate that the correct appearance of the name should be Lewis. It also appears as Lewis on the list of participants.)

Comment: PM2.023

Commenter: M. Amy

Page: 84–5; 95; 107; 113; 124–5; 143; 159; 162–3; 167–8; 200–1
Org: Public Service Commission of Wisconsin

Regarding the different options, commenter responded as follows:

Option 1: Wisconsin does not support Option 1 because it moves the decision making process away from the States, creating problems with State jurisdiction.

Option 2: Wisconsin has the same underlying concern about where the ultimate decision making is made in this option as with Option 1—if it is made by the NRC rather than by the State, that is a shift in authority. Other than that, Wisconsin thinks the guidelines in the Energy Policy Act of 1992 clearly lay out what IRP is, and think that that could be used by the NRC. In Wisconsin, to license a facility, basically, you have to deal with the PSCW and the Wisconsin Department of Natural Resources, and they work very closely together. Regarding the question of whether the States can make findings and provide them to the NRC in a timely manner in license renewal, Wisconsin probably is in the position to do that because, as was discussed earlier, it has forward-looking 20-year plans. Thus, it would always have relatively current infomation about what the needs are.

Option 3: The separation of need from alternatives is not a good precedent to set and would lead to poor planning decisions. It is not clear whether the NRC will get the savings that it anticipates on the need issue because when the States revisit that under Option 3, there would have been an NRC decision on need. So the States would still have to deal with that decision having been made by the NRC.

Option 4: Wisconsin likes Option 4 because it makes it clear where the authority resides and does not mix the authority, creating a potential for conflict. Commenter raised the question why the NRC would have any more of a problem including the same explicit language saying that alternatives and need lie in the State's jurisdiction in Option 4 (if, in Option 4, part of the rationale is that States are in a better position to do the analysis of alternatives and need), than it would for putting that in the rule language in any other option.

Commenter concurs with Minnesota's position on Option 4 (see Comment PM2.021). One of the things Minnesota discussed as an extension to Option 4 was the inclusion of some sort of criteria whereby States could participate in or make the decisions on need and alternatives using the criteria laid out in the Energy Policy Act. This is the one option that, in their view, really leaves the authority with the State and is the preferred option.

Commenter responded to a question posed by NRC staff (why Option 4 which discloses a need analysis is not more prejudicial than Option 3 where a needs analysis is not even done), by noting that the NRC makes an assumption at the beginning—that because the plant exists, there is reason enough to go forward with the process—that confuses the analysis. This raises a question vis-a-vis an earlier comment from the EPA representative: Are we looking at need for the plant when we are doing the

NEPA review or are we looking at need for the action and how does that effect what needs to be included in the action?

In summary, commenter believes that what most people want is pretty clear—the recognition of State jurisdiction over need and alternatives in the rule, relying on State planning for need and alternatives evaluation to the maximum extent possible, and minimum standards for State planning analysis, perhaps based on the Energy Policy Act—a package sufficient to meet the NRC's NEPA requirement. Wisconsin would like to see a modified Option 4 using the State's infomation for the disclosure as well.

Comment: PM2.024
Commenter: J. Gallo

Page: 86–87
Org: Gallo and Ross

In conjunction with turning need for power and alternatives into Category 3 issues so that the timing would mesh closer with the State decision making processes, commenter indicated that a renewed license is something that most utilities want to get early on in the process, even before they decide whether or not they want to operate a nuclear plant in the renewal period. At that time, the States are likely not to be in a position to deal with need because the utility will not be making any application to the State.

Comment: PM2.025
Commenter: R. Callen

Page: 88/135–136
Org: Michigan Public Service Commission

Because it appears to the commenter that there is a certain circularity to an NRC decision that makes its approval conditional on the State determination, commenter noted that there are two separate and distinct decisions needed for a utility to develop and extend the life of a nuclear power plant: (1) approval by the NRC, setting forth the requirements so the utility can determine a price [for life extension]; and (2) a decision on the part of the State. The NRC decision [should] stand on its own in determining what the utility needs to do to [ensure] radiological protection, nuclear safety, operability, etc. The utility will build only once the NRC makes its decision and once the State, in whatever kind of review process it defines as adequate, decides that it is practical and, indeed, advisory to do so.

Comment: PM2.026
Commenter: A. Visnesky

Page: 96
Org: Illinois Commerce Commission

Commenter pointed out that Illinois' statutory requirement dictates that the method used to select the least-cost alternative is present value of minimum revenue requirements. So to the extent that the alternative would not encompass that specific finding, Illinois would have a disparity of criteria for selection methodology for economic sidedness. The implications of that would be either some showing that there was an equivalent value or that the processes essentially yielded equivalent results, or an argument between the State and the NRC over criteria. The end result would be an increased burden on the State in that it would have to explain why its methodology differed from the NRC's.

Comment: PM2.027
Commenter: D. Lewis

Page: 98–99
Org: Shaw, Pittman, Potts & Trowbridge

Commenter suggested that the NRC consider the issue of whether the State's analysis and the NRC's analysis are or should be coextensive. He believes that the scope of the analysis under NEPA is, indeed, different from the State's and more limited, and that NEPA does not require the NRC to do a least-cost methodology or planning, and does not require consideration of economic issues as a general matter. He also believes that the case law is that you only consider economic issues related to environmental impacts.

Comment: PM2.028
Commenter: M. McCarthy

Page: 99; 101
Org: Minnesota Department of Public Service

Commenter stated that States do consider [economic issues] in the context of environmental consequences and in the context of looking at environmental consequences among alternatives. Minnesota and other States have more than just the utility proceeding before the public utility commission to consider and it is important to be aware that there are various ways the States do weigh both the economic and environmental, as well as other social consequences of the decision making.

Comment: PM2.029
Commenter: A. Visnesky

Page: 100
Org: Illinois Commerce Commission

Commenter indicated that Illinois' least-cost process includes both economic issues and environmental processes. Illinois also establishes weights (quantifies externalities) between environmental costs and benefits and puts them in the equation that evaluates the total least-cost option. In response to a question from NRC staff (Are other agencies within the State that have equally important decisions to make with respect to environmental impacts on the same schedule as the public utility commission with regards to license renewal?), he noted that Illinois is similar to Wisconsin (see Comment PM2.030) in that the ICC assumes that all other agencies are in place at the time the certificate is sought.

Comment: PM2.030
Commenter: M. Amy

Page: 100
Org: Public Service Commission of Wisconsin

Commenter noted that Wisconsin's planning process looks at both environmental impacts and costs in determining the appropriate plan to approve. Similar to Illinois (see Comment PM2.029), Wisconsin also establishes weights in an effort to reach a decision that appropriately incorporates both the dollar and the economic impact costs of alternatives in doing the evaluation.

Comment: PM2.031
Commenter: S. Jenkins

Page: 102
Org: Public Service Commission of Wisconsin

In response to a question by NRC staff (Are other agencies within the State that have equally

important decisions to make with respect to environmental impacts on the same schedule as the public utility commission with regards to license renewal?), commenter stated that Wisconsin's Department of Natural Resources, which issues appropriate air, water, and solid waste permits, identifies the major permits that are needed and issues those permits before the PSCW can authorize construction. In response to a second question as to how that would work in license renewal, she indicated that they do not as yet have a procedure.

Comment: PM2.032
Commenter: M. McCarthy

Page: 107–110
Org: Minnesota Department of Public Service

Commenter asked for clarification. He noted that the reliance on the operating license methodology in Option 4, which deferred to the prior determination in the construction permit, effectively was an affirmative decision that could be construed as being preemptive. This would make Options 1, 3, and 4 all look a lot like affirmative determinations of need based on prior decisions.

He also asked for clarification of whether, in dealing with an unamortized asset, the NRC was weighing the economic value against something else, noting that this was confusing in the Staff Discussion Paper. He believes several of the States chose not to support a specific option because the explanation created more confusion than clarity in this regard.

Following the response from NRC staff, commenter stated that what he understood the NRC to say was that since the operating license exclusion rule would not be applied, the NRC would need to use a different rationale to not include the assessment. He suggested as a rationale that the States are in a better position or may have a process that would do a more timely and thorough analysis.

Comment: PM2.033
Commenter: A. Visnesky

Page: 110–112
Org: Illinois Commerce Commission

Commenter noted that, in Illinois, capacity is as much green field capacity as anything else—it is essentially unamortized capacity (asset), albeit at lower cost because it has got some subsidy from existing investment in it. If the NRC is going to apply the logic [that at renewal, with 40 years of operation, the plant probably had been amortized to that extent, such that the unamortized costs would always outweigh any environmental benefit that could be found], the cost number is different because it is not $3,000 KW unamortized cost or $2,000, or whatever it happens to cost. It is more in the neighborhood of $400 to $650, if the DOE and ORNL numbers are used. Commenter asked why the NRC cannot use Illinois' rationale as its rationale.

Comment: PM2.034
Commenter: A. Visnesky

Page: 116–118
Org: Illinois Commerce Commission

Commenter agreed (see Comment PM2.021) that the IRP process should be used by the NRC for guidelines.

Comment: PM2.035
Commenter: E. Ginsberg

Page: 117
Org: Nuclear Management and Resources Council (now the NEI)

Commenter noted with regard to the ICC's comment (see Comment PM2.020) that in the context proposed by him, one should consider that when the NRC does its license renewal application review, it provides several pieces of information that would be very valuable in the context of a State review, such as what is going to be required, be it refurbishment or other things, for license renewal. She suggested that consideration be given to how valuable this information might be in the State determinations.

Comment: PM2.036
Commenter: M. McCarthy

Page: 119–120
Org: Minnesota Department of Public Service

Commenter indicated that what Minnesota is looking for from the NRC is primarily reviews of safety and radiological issues. He also cautioned that within the ICC's premise (see Comment PM2.020) is the assumption that there will always be a need for that amount of capacity at that time at that location. He noted that in Minnesota, they have experienced situations where the need might actually be less or nonexistent. Commenter noted that a major industry can move, there can be a sudden availability in the area or nearby of alternatives that were not perceived, and there can be implementations or changes in technology that will affect demand. Many of these are unknowns and they are difficult to anticipate. He believes that it would be unwise to begin from the premise of need for that amount of capacity for all plants at every point in the future.

Comment: PM2.037
Commenter: S. Nerths

Page: 125–127
Org: Ohio Attorney General's Office

Commenter stated that Ohio staff thought that Option 2 was the worst of the options because they read it to say that the State would do the analysis and the NRC would still have the final say. The State has a statutory responsibility to determine resource allocation and efficiency, but it does not necessarily have to be under any guidelines that the NRC might issue. They can foresee a situation where they would complete a complex process only to have it rejected or be second-guessed by the NRC. Option 4 was more positive in that this situation would not arise. A conditional approval is one solution that Ohio thought of, recognizing that relicensing is really a two-stage process. In a way this could be viewed as complicating the process, but it simply takes out that issue which is really a State issue. If the State decided first, the ruling could be binding on the NRC. If the NRC makes its decision first, the relicense could be conditional upon a State process. Then there also has to be some standard for States that do not address these issues in the same sense as is required under NEPA, in which case the NRC would still have to address it in some fashion.

Comment: PM2.038
Commenter: M. MacMullin

Page: 130–132
Org: U.S. Environmental Protection Agency

Commenter stated that the EPA is prepared to state for the record that, provided that the NRC procedures clearly and unambiguously establish a process that leads to a full, unbiased "hard look" at the submissions made by the State or by the applicants, Option 2 is acceptable to them. In response to a question from NRC staff (if this implies that the NRC does have a requirement to analyze need and alternatives generally as it has been doing), commenter stated that it certainly implies that the NRC has a requirement imposed upon it under NEPA and its own NEPA implementing guidelines and regulations to look at the [State] materials and assure themselves that there is good reason for accepting them. He did think that there is some latitude in terms of what that means on a case-by-case basis; however, the NRC is required to have in place a process that leads it to conclude that the information submitted is good, reasonable, useful information developed in a fair and technically supportable way.

Comment: PM2.039
Commenter: M. Amy

Page: 134–135
Org: Public Service Commission of Wisconsin

Commenter extended a prior question to the EPA (see Comment PM2.021) by noting that there is a parallel State function that has been defined by a Federal agency that may serve the function of relating the Federal process to the State process in a way that lets the NRC avoid having to make judgments about the adequacy of [State] processes. These parallel processes are, on the one hand, the Energy Policy Act of 1992 and the standards that it establishes for IRP at the State level [for the evaluation of need and alternatives], and on the other hand, the State implementation of NEPA, which could serve the same function on the environmental side.

Comment: PM2.040
Commenter: E. Ginsberg

Page: 137
Org: Nuclear Management and Resources Council (now the NEI)

Commenter indicated that one option that had not been discussed widely, but is clearly relevant since [need and alternatives] are State matters, is the option of the NRC not considering need for power or alternatives other than the no-action alternative. She believes there is a very good argument to be made that these things should not be considered—that they are not necessarily within the realm of NEPA—and that the NRC can go ahead and make its NEPA finding without looking at need and alternatives.

(Note: This same comment was made by another NUMARC representative—see Comment PM2.001.)

Comment: PM2.041
Commenter: M. McCarthy

Page: 138
Org: Minnesota Department of Public Service

Following up on NUMARC's comment (that the NRC not consider need for power or alternatives other than the no-action alternative), commenter suggested that the NRC examine 10 CFR 51.10,

Part A, Subpart 2 as a basis for determining what the NRC's NEPA responsibilities are. He believes that the NRC's NEPA requirements might be constrained by the Atomic Energy Act, for instance, so that the NRC has a narrower scope.

Comment: PM2.042
Commenter: E. Ginsberg

Page: 141
Org: Nuclear Management and Resources Council (now the NEI)

Commenter asked the Minnesota representative if it would be more appealing to the States to not have the NRC look at this [need and alternatives] at all. She sees a potential for duplication if the State submits its determination to the NRC, which would need to review it in some fashion.

(Note: See Comment PM2.001.)

Comment: PM2.043
Commenter: A. Visnesky

Page: 142
Org: Illinois Commerce Commission

Commenter stated that although there is some appeal to the idea of not having the NRC look at the issues of need and alternatives, there is an equally attractive appeal to having the NRC recognize and stamp the State review process. This would give the States a slightly better edge in arguing their position before district court judges. It comes down to whether the rebuttable presumption works for or against the State.

Comment: PM2.044
Commenter: R. Callen

Page: 144–145
Org: Michigan Public Service Commission

Commenter voiced his understanding of the NRC's NEPA requirements as being that rather than finding point-of-fact on every issue, NEPA asks an agency to expose its thinking. Therefore an agency's determination cannot be defeated because one alternative that they did not look at is found. The NRC would expose its thinking in terms of the economic viability of the option. It could also recognize that the job that needs to be done suffers from two things: it does not have all the evidence it needs, and the State must ultimately make the decision to go with a license extension. So the NRC does not have to find that this is the highest and best economic decision. Thus the issues of Federal and State approval can be separated.

Comment: PM2.045
Commenter: A. Visnesky

Page: 151–152
Org: Illinois Commerce Commission

Regarding Option 3, commenter clarified what he believes the NRC is saying: that for its purposes, the fact that the existing capacity satisfies the NRC's statutory requirement is a reason to proceed to assess the alternatives. It constitutes a finding of need.

Comment: PM2.046
Commenter: D. Kraft

Page: 153–154
Org: Nuclear Energy Information Service

Commenter had problems with two of the assumptions in Option 3. Regarding the notion that a plant being operated is the same as the plant being used and useful, he believes there is a difference between the two and that the conditions in Illinois over the past decade are an example of that, where controversy has raged over whether a nuclear utility has been over-built or has been prudently built. He believes that these are in fact, corporate decision-based on whether the State has a "use-it-or-lose-it law" in its Public Utilities Act.

Commenter was not sure that the conclusion on page 10 holds: that existing capacity necessitates some form of replacement. While it is correct that at the construction permit stage and the operating license state you have some uncertainty in the projections, he does not think that the assumption is necessarily true that this power, because it is being utilized, will necessitate some form of replacement and, hence, trigger alternatives.

Comment: PM2.047
Commenter: B. Ross

Page: 157
Org: Citizens Utility Board

Commenter agrees with Minnesota's comment (see Comment PM2.021). He has arrived at the same conclusions as others who have spoken against Option 3. He is not sure if the NRC is making a clear enough distinction between power and plant, and whether this adequately recognizes changes in the industry.

Comment: PM2.048
Commenter: A. Visnesky

Page: 164
Org: Illinois Commerce Commission

In response to a question posed by NRC staff (Do the States foresee a situation where, apart from any kind of energy conservation measures, they are going to have reduced demand such that the power provided by a plant would not be necessary?), commenter indicated that one possible scenario, other than the no-growth scenario, is mergers and acquisitions in a competitive electric industry. You may end up with demand re-aggregated and/or parsed, which would take the traditional jurisdictional structure in State regulation and essentially make obligation to serve load—which makes the assumption of need not important anymore.

Comment: PM2.049
Commenter: M. McCarthy

Page: 164–165
Org: Minnesota Department of Public Service

In response to a question posed by NRC staff (Do the States foresee a situation where, apart from any kind of energy conservation measures, they are going to have reduced demand such that the power provided by a plant would not be necessary?), commenter stated that there are other loss-of-load scenarios that could be construed. One could construe loss of an industry or loss of an industry load through self-generation, which may be driven by changing technology and changing relative costs of engineering. There are a number of these considerations that were cited in Minnesota's March 1992 comments.

Comment: PM2.050
Commenter: R. Callen

Page: 165
Org: Michigan Public Service Commission

In response to a question posed by NRC staff (Do the States foresee a situation where, apart from any kind of energy conservation measures, they are going to have reduced demand such that the power provided by a plant would not be necessary?), commenter noted that Kern, Michigan has documented the alternatives for plant refurbishment of nonnuclear plants and found them to be much cheaper than life extension.

Comment: PM2.051
Commenter: Visnesky

Page: 167
Org: Illinois Commerce Commission

Commenter concurs with Minnesota's position on Option 4 (see Comment PM2.021).

Comment: PM2.052
Commenter: M. MacMullin

Page: 168–169
Org: U.S. Environmental Protection Agency

Commenter believes that it is fair to say that the EPA will express serious concern with regard to the compatibility of Option 4 with the NRC's NEPA statutory requirements. It does not appear to them, from their present understanding, that Option 4 could be implemented in any meaningful way consistent with NEPA's requirements to take a hard look at purpose and need, and disclose that in the impact statement and use it in the decision making process. Disclosure, in itself, is not sufficient. In response to a comment from Illinois, he agreed that this could apply to Option 3 as well.

Comment: PM2.053
Commenter: E. Ginsberg

Page: 169–170
Org: Nuclear Management and Resources Council (now the NEI)

Commenter stated that NUMARC's concern is that if you look at the *Calvert Cliffs* case and some of its progeny, you find that the courts were fairly explicit about saying that NEPA is a statute that requires the agency to take a hard look for purposes of making this decision without requiring that any one decision be made regardless of the substance of the decision. But, *Calvert Cliffs* also said that you may not do something which simply attaches, as was proposed in *Calvert Cliffs*, but does not allow a licensing board to look at that information. It seems to NUMARC that there is a concern here because what the NRC has done is to provide an analysis, then leave it hanging out there for disclosure purposes without considering it in the decision. The NRC potentially could be on safer legal ground by not dealing with need for power or alternatives.

Comment: PM2.054
Commenter: M. McCarthy

Page: 172
Org: Minnesota Department of Public Service

Commenter suggested that there might be an analogy in the agreement State protocols that would provide a guidepost on how to approach [developing a procedure or rationale for deferring to the States or coordinating with the States in determining need and alternatives].

Comment: PM2.055
Commenter: Visnesky

Page: 174–175
Org: Illinois Commerce Commission

In response to a question posed by ORNL (The States were concerned about the NRC doing an independent analysis of need and alternatives; however, Option 4 calls for that both at the generic and site-specific levels. How come this is acceptable to the States in Option 4, but not in some of the other options?), commenter stated that the best that the States can apparently get is some attestation that the NRC does not intend in any way to impinge upon or preempt State authority.

Comment: PM2.056
Commenter: Visnesky

Page: 177
Org: Illinois Commerce Commission

Commenter stated that the new option outlined by NRC staff gets very close to a preferred option for him. This would be a combination of Options 2 and 4, whereby NRC staff accepts, under some process or guidelines, a State analysis, if available, that would suffice for the NRC's disclosure obligation under NEPA. Further, the NRC would not make a decision on any individual license renewal based upon the rationale of primacy of State jurisdiction.

Comment: PM2.057
Commenter: Amy

Page: 177
Org: Public Service Commission of Wisconsin

Commenter echoed the comment in Comment PM2.056.

Comment: PM2.058
Commenter: Visnesky

Page: 179
Org: Illinois Commerce Commission

Commenter indicated that Illinois' planning laws suggest that need and alternatives are inextricable factors even though for the NEPA requirement there is no sort of inextricable logical connection between the recognition of need and an assessment of the alternatives to meet that need.

Comment: PM2.059
Commenter: Amy

Page: 179–180
Org: Public Service Commission of Wisconsin

Commenter observed that it appears to be a matter of degree as to how many standards or how much oversight the NRC has to provide over the State process to make it acceptable to the EPA

under NEPA. At one end of that spectrum is the conclusion that the NRC does not need to determine need and alternatives simply to issue a license if those questions are going to be addressed at the State level. The other extreme is that the NRC has to exercise pretty explicit supervision or control, or review in final decision making if there is a State process. Somewhere in that continuum, he believes, is the answer, which depends on legal interpretation.

Comment: PM2.060 **Page:** 184–185
Commenter: Visnesky **Org:** Illinois Commerce Commission

Commenter indicated a willingness to accept the notion that absent any analysis, the party going forward could bring one. But the determination of the adequacy of the analysis gets very fraught with legal complications. If the process is supposed to improve efficiency in bureaucracy, that is not the way to do it.

Comment: PM2.061 **Page:** 189–190
Commenter: Visnesky **Org:** Illinois Commerce Commission

In response to the comment made in PM2.022, commenter believes that if the process involves opportunity for public comment, hearings open to the public, intervenors, etc., that that could be argued as sufficient public discussion. He noted that if it is not a jurisdictional plant, then it does not concern them.

Comment: PM2.062 **Page:** 199; 206–7
Commenter: Visnesky **Org:** Illinois Commerce Commission

In response to a question from NRC staff—that the states give insight into the benefit of completely dropping the rule—commenter believes that it is worth the effort to try and save the rulemaking. He believes some beneficial aspects can still be distilled in terms of streamlining the process and reducing duplication of effort, and possibly improving the economy of bureaucracy. As long as the NRC's process does not raise his burden of proof as far as the State is concerned, and as long as it does not infringe upon due process rights for all the parties in his State process, he believes that a good rule can be fashioned along the compromise discussed at the public meeting. He believes it is important that the issues of need and alternatives remain separable even though the State process has combined them.

Comment: PM2.063 **Page:** 201
Commenter: S. Jenkins **Org:** Public Service Commission of Wisconsin

Commenter posed a question for the EPA and Shaw, Pittman, Potts & Trowbridge representatives: Where a State has a little NEPA, if a joint EIS is prepared and the State defends the part that it prepares and the NRC defends the part that it prepares, does that satisfy NEPA concerns? If it does, then the response to comments and the testimony in defense in a hearing are already available.

Shaw, Pittman, Potts & Trowbridge responded that the NRC and the States can certainly cooperate in preparing their position on these issues. The NRC does have a public hearing process before the ASLB where the issues can be challenged by an applicant or another interested third party, and their hearing rights extend to NEPA issues. So even if the NRC staff and State went in and defended a particular position that they had developed jointly, a third party could come in and present contrary evidence and the ASLB, based on the evidence, might reach an alternative decision. If the States make their decision part of the NRC's decision, they cannot ensure that it will remain untouched.

Comment: PM2.064
Commenter: B. Ross

Page: 202–203
Org: Citizens Utility Board

Commenter noted his concern about preemption and weakening of the resource planning process due to relicensing requirements. The Citizens Utility Board tends to support the modified Option 4 with the additional caveat that some of the technical issues that have been raised be examined.

Comment: PM2.065
Commenter: D. Kraft

Page: 203–204
Org: Nuclear Energy Information Service

Commenter indicated that the environmental community believes that the rulemaking is severely flawed. This public meeting process and the willingness of the States to work cooperatively with the NRC (such as in the agreement States program) are positive processes to use in a reconsideration and reevaluation of the entire rule.

Comment: PM2.066
Commenter: R. Callen

Page: 204–205
Org: Michigan Public Service Commission

Commenter agreed with the direction that the States pursued at this public meeting. He reiterated the following points: (1) that the State process would take precedence because it would be more thorough, timely, and use the kind of experts that only the State has; (2) that this process be nonduplicative; (3) that the Energy Policy Act elevates to the Federal level the requirement to do IRP or something to the contrary; (4) that extending the life of a nuclear power plant is a two-step process and neither of those processes can be offended or negated; and (5) that the State process should lay above and beyond the NRC's process. (See Comment PM2.008.)

Comment: PM2.067
Commenter: E. Ginsberg

Page: 207–208
Org: Nuclear Management and Resources Council (now the NEI)

Commenter stated that, given the current state of the law, NUMARC's unequivocal position is that the States have primacy on economic issues in the context of their own State processes, and NUMARC does not believe that there is any question as to any preemption by the NRC. With respect to the encroachment issue and perception concern, NUMARC believes the NRC should

step back from these issues while still fulfilling its NEPA obligations. There is real benefit in allowing the States to make the decisions they make, given the scope of their authority, and the NRC to make the decisions it traditionally makes, given the scope of its authority. License renewal is a prerequisite to a business decision made later; license renewal provides the industry with significant infomation that will be important in making these future business decisions. (See Comment PM2.001.)

Comment: PM2.068
Commenter: S. Nerths

Page: 208–210
Org: Ohio Attomey General's Office

Commenter indicated that Ohio's first option is that the NRC not get into need and alternatives. However, since it appears that the NRC may legally have to, Ohio wants it clear that the State is not preempted in the areas that it has traditionally been involved in and has obligations to continue to be involved in. Ohio also believes that the timing (for doing the EIS) should be earlier and closer to the actual relicensing and reoperational process. He also suggested that a hands-off approach by the States may be best. The more the States get involved in relicensing, the more these issues meld together and prejudgment of the issues becomes a legal concern.

Comment: PM3.001 **Page:** 12–13; 50–51; 67–68; 126–129
Commenter: E. Gleason **Org:** New York State Energy Office

New York will recommend a fifth option in their formal comments (see Comments S006.005 and PM3.046).

Comment: PM3.002 **Page:** 14; 28–30
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Commenter indicated that Vermont's position is that need and alternatives are a small subset of their concerns. He objected to the "funneling" of the States' concerns into the issues of need and alternatives. Vermont believes that their comments on other topics also contain major policy issues. In particular, Vermont made comments in the radioactive waste area, concerning Category 1 designations and a Category 2 designation for low-level radioactive waste. Vermont's views are as follows: (1) interaction with the State should occur on all their comments, not just need and alternatives; (2) need and alternatives must be designated Category 3; (3) Option 2 appears to most closely align with their concerns; and (4) a consensus-building process must occur in order to find a common evaluation of the real environmental impact from radioactive wastes. Vermont believes that the IRP process allows for a simpler evaluation of the environmental impacts [of license renewal].

Comment: PM3.003 **Page:** 14–15
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter noted that, although there has not been a final position reached by all the Massachusetts interacting agencies, the Massachusetts Office of Attorney General (MOAG) stands by the comments it filed two years ago, and believes that need and alternatives should be Category 3 issues. MOAG also believes that need and alternatives must be decided at the time of relicensing, and concurs with the New York State Energy Office (NYSEO) and the Vermont Department of Public Service (VDPS) that the NRC should not preempt the States' positions with respect to need and alternatives determinations. Finally, MOAG believes that the NRC should reconsider the preparation of a GEIS for relicensing purposes.

Comment: PM3.004
Commenter: G. Brown

Page: 15–16
Org: Committee for a Constructive Tomorrow

Commenter indicated that a continuum of safety is the primary role of the NRC, and that the decision on whether or not a plant should operate is a business one made by the State. He does not view relicensing as a determination that a plant must operate, but rather that a plant can operate.

Comment: PM3.005
Commenter: R. Ng

Page: 16–17
Org: Nuclear Management and Resources Council (now the NEI)

Commenter stated that the industry is proposing a sixth option (see Comment S020.002): that the NRC, in dispositioning its NEPA requirements, does not need to address need or alternatives on either a generic or application-specific basis. Thus, the economic analysis would be done by the utility and the State.

Comment: PM3.006
Commenter: W. Sherman

Page: 29–30
Org: Vermont Department of Public Service

Commenter stated that Vermont believes that the NEPA evaluation is correctly asking the question, "Is there an environmentally preferable alternative to the major Federal action of granting license renewal to a nuclear plant?" For example, is the radioactive waste problem of nuclear plants more or less preferable than the particular environmental impact from an alternative? Vermont believes that the evaluation can be simpler and suggests that the IRP process be used for this.

Comment: PM3.007
Commenter: E. Gleason

Page: 30–31
Org: New York State Energy Office

Commenter noted that they believe that the analysis that was the basis for the proposed rulemaking could have been much more rigorous. He also agrees that the Energy Policy Act of 1992's promotion of IRP needs to be considered within this rulemaking. Finally, recognizing the dilemma the NRC is facing with regard to NEPA, he believes that there are ways of resolving the issue that will not be terribly obtrusive to the utilities that have to comply.

Comment: PM3.008
Commenter: L. Greer

Page: 31–32
Org: Massachusetts Office of Attorney General

Commenter noted that a 5-year rather than a 20-year [license renewal] timeframe would resolve some of the issues. It would address the problems with long-range planning; however, it would not necessarily resolve the issues as to the State's traditional authority.

Comment: PM3.009
Commenter: A. Nogee

Page: 32–36
Org: Massachusetts Public Interest Research Group

Commenter indicated that, with respect to the characterization of State concerns, the Massachusetts Public Interest Research Group shares the same concerns that have been expressed by the States. Any forecast of need or alternatives 10 years into the future has an overwhelming probability of being wrong. In terms of the definition of need, he noted that the NRC adopted the definition that need is an amount of capacity sufficient to replace the proposed capacity of the plant. He added that the effect on the entire utility system must also be considered, both in terms of the nuclear plant and in terms of the proposed alternatives, because they will have different effects on the reliability of the system and reserve margins that are associated with maintaining reliable systems. Some intermittent renewable alternatives, for example wind, may impose higher reserve margin requirements than others.

Comment: PM3.010
Commenter: E. Gleason

Page: 38–39
Org: New York State Energy Office

Commenter stated that New York would like to see analysis at the time of relicensing; they would like to see the numbers. New York would also like to see concrete statements about the lack of preemption of State authority to avoid any confusion on the part of the utilities, the State, or anyone that would be involved.

Comment: PM3.011
Commenter: L. Greer

Page: 39–40
Org: Massachusetts Office of Attorney General

Commenter agreed that the changes proposed by the EPA and the CEQ help in addressing some of the problems in the proposed rulemaking. At the same time, as long as an issue remains as Category 1 or 2, submitting comments on it would appear to be "whistling in the wind." Categories 1 and 2 put the burden on the commenter to come forward with substantive information and to overcome the burden to reopen an issue. This results in a chilling effect on commenters and no obligation on the NRC to consider issues. To really have a meaningful public comment mechanism at the time of relicensing, Category 3 issues are necessary.

Comment: PM3.012
Commenter: W. Sherman

Page: 42–44
Org: Vermont Department of Public Service

Commenter echoed comments from the MOAG and the NYSEO, and added that the real difficulty with the CEQ and EPA comments is that Vermont does not know what the NRC is going to do with the Category 1 or 2 issues which Vermont believes should be Category 3. Vermont believes that this hinders their ability to comment on NRC's proposal. The new and significant test likewise is an uncertainty to them. It appears to be an avenue to prevent adjudication and it establishes a process whereby the NRC makes the determination of new and significant. Then the States have the option to petition for rulemaking, change of rule or waiver, and NRC staff rules on that as well.

Vermont had recommended an update of the GEIS every 2 years, but noted that the NRC's current proposal calls for a 7-year update. As far as the NRC's continuing discussions with the CEQ and the EPA are concerned, Vermont wants to see these understandings in writing. Vermont suggests that the NRC resubmit the proposed rule for public comment since there are significant changes from the initial proposal and there is no industry priority—a pending application—that would make such an offer impractical. However, despite these comments, the CEQ/EPA resolutions do resolve a fair number of their comments.

Comment: PM3.013 **Page:** 50
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter stated that they have argued for 3 years for Category 3 determinations, and New York's State processes have been set up, established, and modified over the last 16 years to provide the kind of analysis required [for need and alternatives determinations].

Comment: PM3.014 **Page:** 51
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter stated that the more difficult question is the mechanism for deferral to the State.

Comment: PM3.015 **Page:** 51–52
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Commenter agreed with the NYSEO's comments (see Comment PM3.013); however, he wanted to address the other side of the coin: What if the NRC does not make need and alternatives Category 3 issues? He noted that Vermont provided significant comments, which could serve as the basis for litigation if need and alternatives were not designated Category 3 issues. He believes that they would like to formally request a hearing if these are not designated Category 3.

Comment: PM3.016 **Page:** 53–54
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter indicated that it is impossible to determine whether a nuclear power plant operating today will be the most economic business decision in the year 2010. Furthermore, it would create confusion if the utilities got a false sense of security from the NRC. New York does not want to create that type of uncertainty. They want a process that only happens once and that does not waste a lot of time and resources.

Comment: PM3.017 **Page:** 54–55; 56; 59–60; 61–62
Commenter: G. Brown **Org:** Committee for a Constructive Tomorrow

Commenter asked for clarification, in that the States are concerned that they will be precluded from making their own decisions about the need for power. He was trying to determine what the

challenge is. The question was raised about 5 years vs. 20 years and if that would help, but licenses are for 40 years. Where does need for power occur as a snapshot in time: if there is a parallel process for all the capacity that is on the grid that determines need for power for every power plant and what is the basis? He also asked how one becomes eligible to get into the process, and what the underlying concern was? Since need for power is obviously an on-line decision, what is the essence of what is being debated?

Commenter believes that the relicensing process ought to be predictable, stable, and understandable. No one is going to be happy if there is great uncertainty in what is happening. Commenter believes that if the IRP process asks the tough questions about nuclear, then it should be used.

Comment: PM3.018 **Page:** 56–58
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Commenter responded to a question posed by the representative from the Committee for a Constructive Tomorrow (Where need for power occurs as a snapshot today: if there is a parallel process for all the capacity that is on the grid that determines need for power for every power plant and what is the basis?) by commenting that NEPA mandates this evaluation. NEPA neither asks about the continuing review that States do, nor does it go beyond that. It takes a snapshot and requires that at the time of the major Federal action, an evaluation be made of whether there are environmentally preferable alternatives. Vermont wants to see that that question gets asked and answered, and they want State input as much as possible. (See Comment PM3.006 also.)

Comment: PM3.019 **Page:** 58–59; 60–61
Commenter: J. Oppenheim **Org:** Massachusetts Office of Attorney General

Commenter stated that implicit in every IRP proceeding or in every ratemaking case is a review of the prudence of the operation of every plant on a going-forward basis. The economic decision at the State level is made at designated points—in rate cases. In a rate case, any intervenor may and frequently does bring up the question of whether it is prudent for a particular plant to remain in rate base or whether an investment that was just made in a particular plant was prudent given the going-forward costs of it and the alternatives. The same thing holds true in IRP although that is still developing. This decision is not one that can be made in a generic fashion; it has to be a site-by-site, time-by-time decision.

Comment: PM3.020 **Page:** 63–64
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Commenter pointed out that the NRC needs to consider in its evaluation plants that are FERC-regulated and have different characteristics than in-State regulated plants.

Comment: PM3.021
Commenter: R. Ng

Page: 64
Org: Nuclear Management and Resources Council (now the NEI)

Commenter stated that license renewal is a prerequisite to the larger business decision of whether a plant continues to operate or not. Certainly, a renewed license is not an authorization to continue to operate the plant beyond 40 years if the economics are not satisfactory. As part of the IRP process, it seems that that is being addressed on an ongoing basis.

Comment: PM3.022
Commenter: A. Nogee

Page: 65–66; 70–71
Org: Massachusetts Public Interest Research Group

Commenter stated that, if there is a presumption that States and citizen groups would have to meet some burden of proof before there can even be adjudication, there will not be confidence in this process. He alluded to NUMARC and Edison Electric Institute reports that concluded that there will not be a future for nuclear power unless the public has more confidence in the technology, the utilities, and the regulators. He believes that there is nothing that would sink the future of the nuclear industry faster than for a community to hear that the NRC generically ruled 30 years ago that there are no cost-effective alternatives to a plant, and therefore, this issue cannot be litigated. If the NRC creates that kind of presumption initially, even for 5 years, let alone the kind of timeframes that are being talked about, it will not have credibility before the public and the States. (See Comment S014.002 also.)

Comment: PM3.023
Commenter: E. Gleason

Page: 69
Org: New York State Energy Office

Commenter suggested that the NRC use the most recent New York State energy plan, look at the conclusions and tone of the analyses, and if the NRC thinks it is adequate for its purposes, use it in any relicensing.

Comment: PM3.024
Commenter: L. Greer

Page: 72–73
Org: Massachusetts Office of Attorney General

Commenter indicated that because of the problems that exist in forecasting long range, decisions [on need and alternatives] cannot be done on a generic basis. She does not want to return to litigating these issues because that is a bad way of making decisions. If reasonable people can hear each other out and address their concerns through the administrative process, that is the best way to go.

Comment: PM3.025 **Page:** 73–76
Commenter: A. Larson **Org:** New England Coalition on Nuclear Pollution

Commenter indicated that the issues [of need and alternatives] are not separate, but completely interrelated. Whenever a generic statement is made, it fails to consider specific instances, and what is being talked about here are specific nuclear power reactors, specific sites, specific communities, specific States with specific needs. So the generic type of statement does not work. She also pointed out that a General Accounting Office (GAO) Report in 1989 stated that: "Neither the NRC nor the industry fully understand all the effects of aging on nuclear power plants." Another GAO report quoted the Electric Power Research Institute as stating that "substituting new efficient technologies for existing less efficient ones could reduce total U.S. electricity demand by 24 to 44 percent by the year 2000." So the whole issue of uncertainty is one that exists not only in regard to power supply, but also in regards to the reactors themselves. Depending on how successful IRP programs are, the need for power may be less, but those types of things can only be seen based on what is happening now.

Commenter also questioned what alternatives were reviewed. A GAO report on solar and wind power estimates that, with levelized costs on various resources by the year 2010, wind, photovoltaic, solar, and thermal will equal gas and coal as far as cost efficiency is concerned. The NRC should focus on what is possible, what is capable, and what is available in particular regions.

Comment: PM3.026 **Page:** 82–83
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter stated that if the NRC were to adopt Option 1 and keep need and alternatives as Category 1 issues, it would still be treating those issues in a generic way. There would still be basic problems with the timeline (still a period of time that is far from the relicensing) and forecasting, and with the variables that affect different plants in each region in terms of need and alternatives. Energy needs in the southwest, for example, may vary differently from energy needs in New England, given changes in population over time. She believes that the generic approach in Option 1 is still problematic and does not get to the States' concerns over their authority and determination of need.

Comment: PM3.027 **Page:** 86–87
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter stated that Option 1 neither resolves New York's concerns over their traditional responsibilities, nor their concerns about the Category 1 and 3 issues. Furthermore, there would probably be an endless discussion over the adequacy of the technical analysis.

Comment: PM3.028
Commenter: A. Nogee

Page: 87–88; 89
Org: Massachusetts Public Interest Research Group

Commenter agrees with the comments from the NYSEO and the MOAG (see Comments PM3.026 and PM3.027). Option 1 would appear to require that an intervenor prove that there were less expensive alternatives available before adjudication could take place, and that is an inappropriate burden to put on the process. "Reasonableness" is a completely undefined standard. It would be better to make need and alternatives Category 3 issues than to leave this arbitrary, undefined preliminary standard that has to be met.

(Note: This is similar to Comment PM3.022.)

Comment: PM3.029
Commenter: W. Sherman

Page: 92–94; 152
Org: Vermont Department of Public Service

Commenter expects that as the States develop their IRP processes, nuclear externalities will be developed, resulting in a process very similar to the same question that the Federal government is required to ask under NEPA. Vermont believes that there is a high likelihood that the NRC's method of determining nuclear externalities will probably not be their method. If, for example, the Waste Confidence Rule or the Low-Level Radioactive Waste Policy Act, as amended, were used, a different conclusion would be reached. He suggests, instead, a consensus-building process, starting from a different point to see if joint views on nuclear externalities can be arrived at. Finally, Vermont supports something like Option 2, although they believe that Option 5 proposed by New York may more clearly reflect their views.

Comment: PM3.030
Commenter: E. Gleason

Page: 94–95
Org: New York State Energy Office

Commenter indicated that New York comes close to supporting Option 2. Their only practical consideration involves the details [for implementing] Option 2. The challenge will be the guidelines since there is not agreement among the States on the definitions, and the States are at different points on the IRP learning curve.

Comment: PM3.031
Commenter: L. Greer

Page: 96–98
Org: Massachusetts Office of Attorney General

Commenter does not see any legal reason why Option 2 would be barred [under NEPA]. The NRC would, under NEPA, have the ultimate responsibility to meet, but in meeting that responsibility it would be in the States' interests to undertake an analysis in a way that would be upheld. She also agrees with both the VDPS and the NYSEO that many States would be able to do this kind of analysis. She raised the issues of whether the States' findings could be made in a timely enough manner for the NRC, and whether there is a single State agency that could be charged with this (States that have an interest in this issue could establish such an agency). She

believes that the thorniest issue presented by Option 2 is the guidelines. Before discussion on the guidelines, the States would have to have some information from the NRC on its requirements.

Comment: PM3.032 **Page:** 98–99; 137–138
Commenter: B. Abbanat **Org:** Massachusetts Department of Public Utilities

Commenter noted that the power from a particular nuclear plant within the New England States is typically sold to two or more States. Thus, it might be a challenge to bring State reviews together on a timely basis.

Comment: PM3.033 **Page:** 99
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter noted that a question that arises in New England is what happens when two States come up with different analyses for a given plant. Will deferral be made on a percentage of power basis?

Comment: PM3.034 **Page:** 100–101
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter indicated that just because a plant exists and is operating does not mean it is an economically viable option at this point in time. New York and New England have a surplus of capacity currently such that Consolidated Edison recently decided not to renew a contract for a nuclear power plant because they can get the power cheaper elsewhere.

Comment: PM3.035 **Page:** 103
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Commenter stated that Option 3 does not go very far to resolve Vermont's concerns. The NRC is required to determine need through NEPA.

Comment: PM3.036 **Page:** 105–106
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter indicated that Option 3 is a very nice option, except for its practical impact on New York. The problem is in how this option gets translated.

Comment: PM3.037 **Page:** 107–108
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter noted that there is a legal concern over whether Option 3 allows the NRC to comply with NEPA. At issue is a decision that is, at a minimum, 40 years out and projections that are

60 years out. If there is a lesser need, then that is something that the NRC, in making its relicensing decision, would want to think about in terms of the environmental factors. If the plant continues to operate, it is going to continue to generate wastes. The States are all struggling with low-level siting issues as well as with questions about the ultimate disposal of high-level waste. So you cannot divorce the need issue from the other environmental concerns. Commenter views need as the conservation alternative in terms of meeting energy supply. If the NRC is planning to do this in the same way as it does the operating license, she thinks that it is likely to be challenged under NEPA.

Comment: PM3.038
Commenter: J. Oppenheim

Page: 114–115
Org: Massachusetts Office of Attorney General

In response to a hypothetical situation raised by another commenter (If there was a tremendous amount of over-capacity and a nuclear plant was producing power the cheapest, what would be the need determination and what does one do with that decision?), commenter noted that need in utility planning is basically an economic idea. You look at the entire stream of to-go costs and compare them with the alternatives. Divorcing need from economics and from alternatives is an abstraction; they are all necessarily done together. The reason they are being separated is because NEPA says you have got to do something about need. Commenter believes that that should be confronted head on even though the determination of need and alternatives is what the States really want to do and what they are mandated to do under the Energy Policy Act.

Comment: PM3.039
Commenter: A. Nogee

Page: 115–116
Org: Massachusetts Public Interest Research Group

Commenter noted that the problem with separating need, alternatives, and economics is that it might very well be the case that, on the particular day when the question of relicensing comes up, the do-nothing alternative is cheaper than the conservation alternative because of excess capacity at that point. In order to do rational planning, these scenarios should be considered. There is a lot of speculation that utilities might be facing declining load forecasts for a while. There is also a lot of talk about retail wheeling and utilities losing load to individual self-generators. These possibilities cannot be ruled out generically and not dealt with.

Comment: PM3.040
Commenter: W. Sherman

Page: 118–120
Org: Vermont Department of Public Service

With regard to Option 4, the commenter questioned whether the NRC could fulfill its NEPA charge by not looking at the alternatives. He did not believe that Vermont would support an option that allowed a decision to renew a license (presuming that the safety, the 10 CFR Part 54 process, was completed) if an environmentally preferable alternative were disclosed but disregarded.

Comment: PM3.041 **Page:** 120–121
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter noted that in the example provided (see Comment PM3.040), the NRC would essentially be looking to the States in the rate-setting process to bear the burden of deciding that the continued operation of a plant is less preferable than the alternative. She commented that two possibilities that have to be confronted in that kind of a scenario are 1) the utility will say that the State is wrong because the NRC found relicensing to be the best [alternative] in its disclosure analysis (even if they did not factor it into their relicensing decision); or 2) it would certainly be likely to be introduced as an evidentiary matter.

Comment: PM3.042 **Page:** 122–123
Commenter: J. Oppenheim **Org:** Massachusetts Office of Attorney General

Commenter noted that a certain amount of conflict is built into the statutes and the States would be sure to point that out in any situation such as that suggested by another commenter (see Comment PM3.041). Any prior NRC disclosure would probably be waived before the State commission by the utility. He believes this problem is a manageable one.

Comment: PM3.043 **Page:** 123–124
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter stated that none of their five attorneys consulted in regard to Option 4 believe that the NRC could implement it under NEPA.

Comment: PM3.044 **Page:** 124–125
Commenter: A. Larson **Org:** New England Coalition on Nuclear Pollution

Commenter noted that the DOE reported (in GAO 93-118) that while there is wide disagreement about how environmental costs or externalities should be valued, the current system is inadequate and not all externalities are being calculated into the costs. There are a lot of costs associated with nuclear power that are not making their way into ratepayers' monthly bills. Likewise, as noted in GAO Report 91-6, counterfeit and substandard products are going to be a concern as plants get older and this is reflected in repair costs. Utilities reported finding nonconforming fasteners, such as nuts, bolts and screws, in 58 percent of the plants. Some were installed in systems needed to shut down the reactor or mitigate an accident. These illustrations indicate that there are a lot of things that are going to and do effect the costs of electricity.

Comment: PM3.045 **Page:** 125–126
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter responded to a comment by the New England Coalition on Nuclear Pollution (NECNP) (see Comment PM3.044), by pointing out that nuclear compares favorably in most externality studies—in New York State, for example, air quality benefits are valued at a greater

rate than some of the solid waste issues. He believes that we need to look at the externalities of all alternative energy sources.

Comment: PM3.046 **Page:** 126–137
Commenter: E. Gleason **Org:** New York State Energy Office

Commenter presented New York's fifth option (see Comment S006.005). He believes that the NRC is under a legal obligation under NEPA, and that the only way to meet this obligation is by making need and alternatives Category 3 issues and then adopting the State analysis on those issues. As a legal issue, the NRC has to look at need and alternatives, and it cannot look at them generically. New York is proposing that since it is the State's responsibility to do the need and alternatives analysis, that the NRC simply adopt the most recent State determination on need and alternatives.

Commenter responded to a question from the NECNP representative: an application for relicensing is made to the NRC, triggering the NRC's obligation to do a Category 3 EIS on these issues. How does New York see the State doing the analysis? Do they see the State doing the analysis in terms of an individual agency within the State, or do they see the NRC simply picking up the most recent information generated by the State, or do they see the State initiating it the context of a rate proceeding? Commenter stated that New York has an energy planning process that is updated every two years. If New York felt that the results of that process were sufficient for the NRC's purpose, they would not have a problem with the NRC using their analysis (which would have gone through a regulatory proceeding) and basing its determination on it. If, on the other hand, New York saw a need to modify their analysis, they would do so. If a State does not have a process such as New York's, one of the other options suggested by NECNP would do. However, it all hinges on an attempt to do two things: 1) to recognize that the NRC has a NEPA requirement, and 2) to determine a way to meet this requirement while retaining the States' responsibility for need and alternatives.

In response to a question from an NRC staff member (Does New York's option expedite the current operating license proceeding?), commenter stated that the NRC would not have to get into a whole analysis of need and alternatives because it would already have been done. All the NRC would have to do is review the analysis.

In response to a question from another NRC staff member (What would happen if the NRC adopts the State analysis and it is incorporated into the draft site-specific EIS, which is published for public comment, and the NRC receives public comments that take issue with the State analysis?), commenter stated that it would be the State's responsibility to help the NRC respond to those comments.

In response to a comment from a representative of Scientech (Most States do not do IRP or they require the utilities to do it and bring it to them. So, in effect, the NRC would be relying on the applicant's information.), commenter stated that he would assume that the State review is rigorous enough to pass whatever State test there is for the IRP process.

In response to a question from ORNL (There are determinations about viability of alternatives and determinations about the type and nature of environmental impacts. Does commenter intend that

the NRC adopt and defer to State determinations about the viability of these alternatives or about the nature and characteristics of the environmental impacts of the alternatives?), commenter stated that they would like the NRC to do the whole thing since New York does the same. New York looks at the environmental implications of every technology and action. They study an option from an economic perspective as well as from an environmental perspective, and then they prepare an EIS on their entire energy plan, which goes out for another round of public comment.

Comment: PM3.047 **Page:** 135–136
Commenter: W. Sherman **Org:** Vermont Department of Public Service

Following up on Comment PM3.046, commenter agreed that the utilities prepare the IRP, but added that that goes through a complete public process in Vermont, which is an adjudicated public review and approval of the IRP. So, it is a much more rigorous process.

Commenter also asked if 40 CFR 1506.2 (working with the States and elimination of duplication with State and local proceedings) had been considered in relation to improved efficiency.

Comment: PM3.048 **Page:** 137–138
Commenter: B. Abbanat **Org:** Massachusetts Department of Public Utilities

Commenter noted that in Massachusetts they typically do not make findings on the need for specific facilities, nuclear or otherwise. In Massachusetts's IRP process, there is a focus on the need for new capacity and there is the possibility that given specific extraordinary circumstances, the Commission would focus on the need and, in particular, the economics of an existing facility. Within Massachusetts, under the current framework, you would not expect to see a finding that would focus on the need for any existing facility in particular.

Comment: PM3.049 **Page:** 138–139
Commenter: L. Greer **Org:** Massachusetts Office of Attorney General

Commenter raised the point that if Option 5 (New York's option; see Comments S006.005 and PM3.046) were adopted, there would probably have to be a default position where, to the extent that a State either did not wish to or had no mechanism to do the analysis, the NRC would be in a position to do it. On the other hand, she believes it is foreseeable that over the next 40 years States will adopt mechanisms to decide these issues.

Comment: PM3.050 **Page:** 139–140
Commenter: A. Nogee **Org:** Massachusetts Public Interest Research Group

Commenter indicated that they support the major part of New York's Option 5, particularly the statements on preemption, that need and alternatives be Category 3 issues, and that the rule make reference to the State's findings on need. But, in addition to the possibility that States might, in fact, reach different conclusions on need, he also believes that Congress did set up a system of

dual regulation where both the States and the Federal Government have the responsibility of ensuring that projects are needed and that there are not preferable alternatives before they proceed. Also, not every State would want its review deferred to, either for lack of resources or for other reasons. Furthermore, he does not believe that citizen groups would necessarily agree with having the State process be the final arbiter of need, irrespective of the NEPA requirement. (See Comment S014.004 also.)

Comment: PM3.051
Commenter: L. Greer

Page: 142
Org: Massachusetts Office of Attorney General

Commenter stated that one of the things that should probably be in the guidelines is some kind of timeline for presentation of the analysis. It would have to be reasonable in terms of the timeline for relicensing, but also flexible. If someone seeks relicensing five years before the license is up, the NRC is going to have a smaller window to work within. Similarly, an application 20 years ahead would have to be addressed in some way.

Comment: PM3.052
Commenter: R. Ng

Page: 143–148
Org: Nuclear Management and Resources Council (now the NEI)

The NUMARC representative presented the same comments previously presented at the Chicago public meeting (see Comment PM2.001). He noted that industry (NUMARC) has a different legal interpretation of NEPA than that expressed by others at this meeting. NUMARC believes that their proposal (that the NRC not address need and alternatives) is a more straightforward approach than Option 2, provides a clear delineation between State and Federal authority, and puts into place the consideration of economic issues between the utility and State regulatory agency. He believes these comments are also possibly relevant to the legal ramifications of Option 5 (New York's option; see Comments S006.005 and PM3.046) as well. He believes that "the devil is in the details" in implementing Option 5 when multiple jurisdictions are involved. He believes Option 5 would lead to tremendous instability and unpredictability for utilities.

Comment: PM3.053
Commenter: E. Ginsburg

Page: 148–149
Org: Nuclear Management and Resources Council (now the NEI)

Commenter responded to a question from the Vermont representative (How does NUMARC's option meet the NEPA requirement to answer the question, "Is there an environmentally preferable alternative to the proposed Federal action?") by stating that the answer lies in the way that the major Federal action is defined. If it is defined in such a way as to narrow the scope, then the NRC is able to look only at the no-action alternative. She believes that there is defensible case law in support of this. There is a way to define the Federal action such that what you are looking at is whether or not the NRC should or should not grant licenses to nuclear power plants which are currently operating.

Comment: PM3.054
Commenter: W. Sherman

Page: 151–152
Org: Vermont Department of Public Service

Commenter defended Option 5 (New York's option; see Comments S006.005 and PM3.046) against NUMARC's claims of instability and unpredictability. He believes that it would not be as difficult because utility-provided analyses taken from State processes were used in construction permits, which dealt with need and alternatives. Then the NRC provided the EIS and all parties worked together to satisfactorily defend the EIS in any hearings. He does not believe that there was a lot of difficulty in working together then, and he does not foresee any difficulty in working together on license renewal.

Comment: PM3.055
Commenter: L. Greer

Page: 153–154
Org: Massachusetts Office of Attorney General

Commenter followed up on NUMARC's comment (see Comments PM3.052 and PM3.053) by noting that in New England there is potential for conflict and for different results [given the fact that you have multiple States and agencies involved]. At the same time, she believes that that possibility can be addressed by having a default position if a conflict develops, either in terms of deferring to the analyses of a majority of the States that draw power from these nuclear plants, or some other alternative. She believes that any difficulties can be worked out because all parties have an interest in having the relicensing process proceed as smoothly as possible.

B-4. Summary of Written Comments on the NRC's Discussion Paper (59 FR 2542)

Comment: S001.001
Commenter: Chalfant et al.

Page: v; 5-8
Org: State of Minnesota

The State of Minnesota commented that Minnesota remains concerned that the proposed rule still obstructs public participation and encroaches on State authority. Changes proposed in response to the CEQ's and the EPA's comments do not substantively address Minnesota's concerns.

A site-specific environmental impact statement (EIS) only addresses issues not previously "resolved" by the proposed rule and associated GEIS. Once generic determinations are made (i.e., now), these issues cannot be reopened later without overcoming difficult and cumbersome rulemaking procedures, or demonstrating new and significant information. Thus, information critical to the NRC's environmental review process may be rejected solely because it is deemed not to constitute "new" information. This shifts the NRC's burden of environmental disclosure to the States and the public, and does little to allay Minnesota's concerns.

(See Comments 054.006, 054.009A, and 060.001.)

Comment: S001.002
Commenter: Chalfant et al.

Page: v; 9–13
Org: State of Minnesota

Minnesota commented that designation of need and alternatives as Category 1 issues wholly disregards the State's traditional role on these issues. This has two broad implications. First, the NRC's generic determinations may become presumptive findings in subsequent State integrated resource planning (IRP) or similar proceedings. Second, States may be forced to intervene in NRC proceedings at the time of individual nuclear power plant relicensing application if the GEIS's generic determinations regarding need and alternatives differ from State IRP or similar proceedings. Resolving key differences between State findings and prior NRC determinations, perhaps even decades old at the time of relicensing application, would impose unnecessary administrative and legal burdens on the States and industry in Federal and State proceedings.

(See Comments 054.002, 054.012, 054.015, 054.016, 060.007, and 060.008.)

Comment: S001.003
Commenter: Chalfant et al.

Page: vi; 14–19
Org: State of Minnesota

Minnesota commented that the proposed rule falls far short of full NEPA environmental disclosure. The proposed rule fails to provide required information in three critical ways:

1. Each technical inadequacy in the draft GEIS, identified in Minnesota's previous filing, indicates incomplete or unavailable information.

2. Failure to rely on State IRP or similar proceedings omits the most timely and complete information available regarding need and alternatives. Information from the State's environmental review under the State's NEPA and other existing environmental policies and standards are excluded. (See Comments 054.008 and 054.014.)

3. The proposed rule fails to encourage adequate public participation in the development of information regarding the environmental consequences of license renewal. (See Comments 054.013 and 060.001.)

Comment: S001.004
Commenter: Chalfant et al.

Page: 3–5
Org: State of Minnesota

Minnesota commented that at the heart of its concerns is the NRC's extensive reliance on generic determinations that foreclose meaningful State and public input. The designation of need and alternatives as Category 3 issues would afford these issues the level of scrutiny that they deserve during license renewal. Many of the environmental impacts should also be designated as Category 3 issues because they also deserve to be considered fully at the time of individual nuclear power plant relicensing applications.

(See Comments 054.019, 054.021–30, 054.034–5, 054.037, 054.044–5, 054.057, 054.072–3, 054.075, 054.077, and 060.001–2.)

Comment: S001.005
Commenter: Chalfant et al.

Page: iv; vii; 20–26
Org: State of Minnesota

Minnesota commented that it would prefer that the NRC withdraw its proposed rule and associated GEIS. Many of the multiple errors and inadequacies of the proposed rule and GEIS are beyond the explicit scope of the January 1994 NRC Staff Discussion Paper and the related public hearings. If the proposed rule and the GEIS are not withdrawn, then the NRC must adopt the following four key modifications to address Minnesota's concerns.

1. **Redesignation of need and alternatives as Category 3 issues to be considered fully by the NRC in its environmental review of individual nuclear power plant relicensing applications.** This modification will accomplish three key objectives:

   a. It minimizes conflict between the State's traditional authority over the determination of the need for additional generating capacity and the NRC's treatment of need and alternatives for purposes of satisfying its environmental review duties.

   b. It facilitates State and public participation because need and alternatives would be considered fully during the NRC's environmental review of individual nuclear power plant relicensing applications.

   c. It ensures that the NRC will be able to consider the most complete and timely information available regarding need and alternatives during its environmental review process.

2. **Implementation of an environmental review process whereby the NRC considers to the maximum extent possible the record developed in State IRP or similar proceedings, including underlying data and analyses, as the most complete and timely**

information available regarding need and alternatives, and the NRC accords substantial weight to State determinations in these proceedings. This modification is necessary to secure the NRC's full consideration of the record developed in State IRP or similar proceedings, and to be in compliance with the CEQ's requirement that Federal agencies cooperate with State agencies to the fullest extent possible to reduce duplication between NEPA, State, and local requirements, and with the CEQ paperwork reduction directive.

3. **Inclusion of an explicit statement in the text of the proposed rule itself that the rule in no way preempts State jurisdiction over the determination of the continued need for nuclear power plant capacity and that the NRC's consideration of need and alternatives is only intended to fulfill its environmental review duties.** Such a statement must be included to ensure that there is no ambiguity about the extent of the NRC's authority.

   If the NRC adopts the proposed rule, the NRC must amend 10 CFR 51.1 (1992) to read (see Comment 054.010):

   > These regulations do not preempt a State's right and responsibility to determine need for continued nuclear power generation based on non-safety considerations, including its own State and local environmental reviews.

   In addition, the NRC must add the following provision to the proposed rule:

   > The supplemental report must contain the State's decision on the need for that applicant's nuclear power generation. Where the State has found no need for continuing power generation by the applicant plant, the findings documented in Table B-1 of Appendix B of Subpart A of this part no longer demonstrate that renewal of the applicant's operating license will have accrued benefits that outweigh the economic, environmental, and social cost of license renewal.

   This provision could be placed in proposed 10 CFR 51.53(c) as a new provision "(5)" or as part of "(4)".

4. **Revision of the draft GEIS to address the numerous technical inadequacies cited in the Minnesota's March 13, 1992, filing.** In 1992, Minnesota provided 38 pages of specific comments and recommendations on technical inadequacies in the proposed rule that have yet to be addressed by the NRC.

Comment: S002.001 **Page:** 1
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The Vermont Department of Public Service (VDPS) commented that a determination of the extent to which Vermont's concerns are resolved by possible changes to the proposed rule would require a review of the actual rewording and notes of consideration. Since these changes appear to be significant, Vermont believes the proposed rule, or at least portions thereof, should be reissued for comment prior to making it final.

Comment: S002.002
Commenter: R. P. Sedano

Page: 2
Org: Vermont Department of Public Service

The VDPS commented that the NRC's discussion paper is inaccurate to the extent that it characterizes Vermont's major concerns as only need and alternatives; redesignation of categories is also a major part of Vermont's concerns. Vermont hopes that State/NRC collaboration can continue in resolving these concerns as well.

Comment: S002.003
Commenter: R. P. Sedano

Page: 2
Org: Vermont Department of Public Service

The VDPS commented that NRC staff should use, to the maximum extent possible, the results of the IRP process that States are implementing in accordance with Section 111 of the Energy Policy Act of 1992. Vermont's IRP process requires the preparation of a "least-cost integrated plan," based on the lowest present value life-cycle cost, including environmental and economic costs. Vermont has developed a method for including environmental effects or externalities for certain air emissions in least-cost determinations. As the IRP process matures, nuclear externalities will also be considered. When developed, nuclear and air emission externalities will provide the basis for comparison of the costs of license renewal with alternatives to license renewal. This is essentially the comparison required by NEPA.

Comment: S002.004
Commenter: R. P. Sedano

Page: 3
Org: Vermont Department of Public Service

The VDPS commented that it prefers NRC Discussion Paper Option 2 (the NRC adopts State analyses and determinations) over the other options. It recommends the elimination of Options 3 and 4 because it does not believe that the goals of the NEPA review can be accomplished without considering need and alternatives to the major Federal action.

Comment: S002.005
Commenter: R. P. Sedano

Page: 3
Org: Vermont Department of Public Service

The VDPS commented that in order to address Vermont's concerns, need and alternatives must be redesignated as Category 3 issues and be fully considered in individual nuclear power plant license renewal applications, and the proposed rule must include a statement that the rule will not preempt State jurisdiction. (See Comments 079.019, 079.027, 079.071, 079.083a, and 079.103.)

Comment: S002.006
Commenter: R. P. Sedano

Page: 3
Org: Vermont Department of Public Service

The VDPS commented that in order to address Vermont's concerns, implementation of an environmental review process must occur whereby the NRC (1) considers to the maximum extent possible the record developed in State IRP or similar proceedings, and (2) accords significant weight to State determinations in those proceedings.

Comment: S002.007 **Page:** 3
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the revised GEIS must address the numerous technical inadequacies cited in its comments of March 16, 1992.

Comment: S002.008 **Page:** 3
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS adopts the comments and recommendations of Minnesota submitted pursuant to 59 FR 2542 (See S001 Comments).

Comment: S003.001 **Page:** 1
Commenter: S. L. Hiatt **Org:** Ohio Citizens for Responsible Energy

The Ohio Citizens for Responsible Energy (OCRE) indicated that any findings made by the NRC under NEPA regarding license renewal would not in any way preempt or conflict with the traditional authority of States to regulate electric utilities. The NRC is charged with implementing NEPA, determinations under which involve an assessment of need for the proposed action. The NRC has traditionally considered questions of need for power and alternative sources of energy in issuing construction permits and operating licenses. The NRC's findings did not bind the States then, and will not in the case of license renewal either. Market forces and State regulation will be the decisive economic factors influencing utility decisions regardless of what the NRC may find in any generic or plant-specific EIS. Federal preemption under the Atomic Energy Act (AEA) extends only to radiological health and safety matters, not to need for electricity and economic questions.

Comment: S003.002 **Page:** 1
Commenter: S. L. Hiatt **Org:** Ohio Citizens for Responsible Energy

The OCRE supports the revisions to the proposed rule in response to the CEQ and the EPA comments because they will retain meaningful public participation rights in NEPA issues.

Comment: S003.003 **Page:** 1
Commenter: S. L. Hiatt **Org:** Ohio Citizens for Responsible Energy

The OCRE supports the NRC proposal to review and, if necessary, update the environmental analyses every 7 years. This should reduce the potential for error inherent in making long-range predictions.

Comment: S004.001
Commenter: Parrino et al.

Page: 3
Org: Public Service Commission of Wisconsin Commissioners

The Public Service Commission of Wisconsin (PSCW) Commissioners support the position outlined in NRC Discussion Paper Option 4, where State regulatory agencies are responsible for the economic regulation of utilities and have statutory responsibility to conduct energy policy planning. The PSCW Commissioners do not believe that an attempt to establish need for power on a generic basis is compatible with the scope and complexity with which Wisconsin and many other States evaluate need in their planning and certification processes. The PSCW Commissioners, however, would amend Option 4 to include the caveat outlined in Option 2 that, if State analyses of need for capacity and availability of alternatives are not available for a license renewal application, the responsibility for conducting such analyses would ultimately fall back on the NRC. (See Comment S008.001.)

Comment: S004.002
Commenter: Parrino et al.

Page: 3–4
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners agree that the concerns expressed in Section III of the discussion paper are representative of the views of the various States and commend NRC staff for listening to the States. (This responds to Focus Question No. 1 in the paper entitled "Addressing the Concerns of States and Others Regarding the Role of Need for Generating Capacity, Alternative Energy Sources, Utility Costs, and Cost-Benefit Analysis in NRC Environmental Reviews for Relicensing Nuclear Power Plants: An NRC Staff Discussion Paper," published in the *Federal Register* [59 FR 2542] for public comment.)

Comment: S004.003
Commenter: Parrino et al.

Page: 4
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners share the concern of other States that the NRC's treatment of need for generating capacity and availability of alternative energy sources is in direct conflict with State regulatory authority over these matters. Only by designating these items as Category 3 and adopting State determinations of need and alternatives can State concerns be laid to rest. The PSCW Commissioners also recognize that in taking this step, there is implicit agreement on the part of States to thoroughly and expeditiously carry out their responsibilities and to cooperate in any way possible with the NRC. (This comment addresses NRC Focus Question No. 2.)

Comment: S004.004
Commenter: Parrino et al.

Page: 4
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners' concerns would not be resolved if the GEIS and the rule are modified to include statements that the NRC's findings with respect to need and alternatives are only

intended to assist the NRC in meeting its NEPA obligations and do not preclude the States from making their own determinations with respect to these issues. The States have "been down this road before" with respect to statements of nonpreemption in such areas as the Federal Power Act and have ended up losing many battles in court. If the NRC chooses Option 4 any doubt as to regulatory responsibility would be removed. (This comment addresses NRC Focus Question No. 3.)

Comment: S004.005
Commenter: Parrino et al.

Page: 4–5
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners believe that the decision method in Option 1 is neither entirely clear, nor do the refinements made in this option resolve the primary problem of overlap and possible preemption of State authority. In addition, any determination on these issues in a generic manner will result in significant timing problems since changes to local forecasts of energy or capacity need can and will occur, and other alternative energy sources will be developed. Even if these timing problems could be addressed in a supplemental environmental impact statement (SEIS), it is not clear that the NRC's analysis would be as integrated or detailed as Wisconsin's IRP process. (This comment addresses NRC Focus Question No. 4.)

Comment: S004.006
Commenter: Parrino et al.

Page: 5–6
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners do not see any major legal problems if the NRC accepts a State's analysis of need and alternatives. The Energy Policy Act of 1992 in 111(a)(7) requires each State regulatory authority to consider adopting IRP. They believe that this Act provides almost all of the practical guidelines that the NRC would need to determine if it could readily accept a State's conclusions on these issues. (This comment addresses NRC Focus Question No. 5.)

Comment: S004.007
Commenter: Parrino et al.

Page: 6
Org: Public Service Commission of Wisconsin Commissioners

With regard to Focus Question No. 6 (Do the States have legal concerns or see other problems if the NRC adopts the position that need for generating capacity need not be analyzed in a license renewal review as discussed in Option 3?), while the PSCW Commissioners agree with the NRC that the situation at license renewal is somewhat different from that at the construction permit phase, they believe that there are some similarities, particularly if substantial capital cost additions are required. Also, while it is reasonable to assume that retirement of an existing plant would likely necessitate some form of replacement, it is possible that licensees might seek license renewal for an existing plant either before a State has assessed whether its continued operation is economical or, perhaps, even in spite of the fact that the State regulatory agency has indicated that it might not be economical. They agree that this latter circumstance is not likely, given that the

practical cost considerations are already having an impact on the continued need for certain existing plants. (This comment addresses NRC Focus Question No. 6.)

Comment: S004.008
Commenter: Parrino et al.

Page: 6–7
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners prefer that the NRC treat the issues of need and alternatives for disclosure purposes only and exclude them from the NRC's decision on whether to renew an operating license as discussed in Option 4. They believe that not only are there no grounds for any legal concerns, but such action would actually make clear that the legal responsibility to deal with these issues lies with the States. If the NRC chooses Option 4, they believe the States would be more than willing to provide the kind of information necessary for the NRC to meet its NEPA obligations. (This comment addresses NRC Focus Question No. 7.)

Comment: S004.009
Commenter: Parrino et al.

Page: 7
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners commented that the only option that is not covered in Section V is a slight modification of Option 4 to include the aspect of Option 2 which would recognize that if State analyses of need for capacity and availability of alternatives are not available for a license renewal application, the responsibility for conducting such analyses would ultimately fall back on the NRC. They pointed out that even in this instance, the States could assist the NRC in carrying out the case-specific analysis required by NEPA. (This comment addresses NRC Focus Question No. 8.) (See Comment S004.001.)

Comment: S004.010
Commenter: Parrino et al.

Page: 7
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners believe that the basic strength of Option 4 that distinguishes it from the weaknesses of the other options is that Option 4 clearly delineates that the responsibility for assessing need and alternatives lies with the States. By implication, it also clearly recognizes the NRC's responsibility for ensuring that nuclear power plants can and will be operated safely and that the environmental impacts of license renewal and continued operation are properly considered. The Commissioners would have no problems with carrying out their responsibilities for determining need for generating capacity and availability of alternative energy sources if Option 4 is adopted by the NRC. (This comment addresses NRC Focus Question No. 9.)

Comment: S004.011
Commenter: Parrino et al.

Page: 7
Org: Public Service Commission of Wisconsin Commissioners

The PSCW Commissioners urge the NRC to adopt Option 4 and to recognize that States are responsible for making assessments of need and alternatives, and that States conducting fully-developed IRP processes would meet any guidelines for such assessments that the NRC might need to consider in carrying out its NEPA responsibilities. (This comment addresses NRC Focus Question No. 10.)

Comment: S005.001
Commenter: D. W. Edwards

Page: 1–2
Org: Yankee Atomic Electric Company

The Yankee Atomic Electric Company (YAEC) requests a 3-week extension of the comment deadline to March 25, 1994, since it just learned that the entire substance of the private negotiations between the NRC, the CEQ, and the EPA discussed in SECY-93-032 are open for comment, placing an entirely different slant on its response to 59 FR 2542.

Comment: S006.001
Commenter: E. J. Gleason

Page: 1–2
Org: New York State Energy Office

While the New York State Energy Office (NYSEO) recognizes the significant effort expended by the NRC in the rulemaking to date, it does not believe that the major concerns expressed by the States are adequately resolved by the modifications and options discussed in the NRC's Staff Discussion Paper. As presented in its initial comments, the NYSEO believes that the NRC's responsibilities under NEPA to examine alternatives to license renewal cannot be satisfied by generic conclusions reached in a GEIS years in advance on inherently project-specific issues such as need and alternatives. (See Comment 031.002.)

Comment: S006.002
Commenter: E. J. Gleason

Page: 3
Org: New York State Energy Office

The NYSEO commented that the issues of need for and alternatives to license renewal are inherently project specific. To the extent NEPA requires the NRC to examine these issues, they must be examined in an SEIS prepared at the time a license renewal application is submitted. Accordingly, NYSEO recommends that for purposes of this rulemaking, these issues be designated as Category 3.

Comment: S006.003
Commenter: E. J. Gleason

Page: 3–5
Org: New York State Energy Office

The NYSEO reiterated its strong concern that, in carrying out its NEPA obligations, the NRC should in no way encroach on the traditional jurisdiction of the States regarding the regulation of utilities for issues other than nuclear safety issues. It believes that the proposed rules conflict with

the Energy Reorganization Act of 1974, which limits the role of the NRC to regulation and not to promotion of nuclear power; and with the Energy Policy Act of 1992, which promotes the implementation of IRP by the States. State planning efforts provide appropriate mechanisms, such as IRP and the NYSEO State comprehensive energy planning processes, to examine the alternatives best suited to the State's and utilities' needs, and are fully consistent with the historic role exercised by the States. (See Comment 031.002.)

Comment: S006.004 **Page:** 6–7
Commenter: E. J. Gleason **Org:** New York State Energy Office

The NYSEO believes that none of the four options set out in the NRC's Staff Discussion Paper appropriately harmonizes the responsibilities of the NRC and the States. It rejects Option 1 because it assumes generic findings by the NRC that cannot be justified. Options 2, 3, and 4 seemingly violate NEPA by delegating or foregoing required NEPA determinations. Options 2 and 3 require States to adhere to the NRC guidelines on need for capacity or alternative energy sources and cannot be implemented without encroaching on the traditional jurisdiction of the States regarding the regulation of utilities for issues other than nuclear safety.

Comment: S006.005 **Page:** 7–8
Commenter: E. J. Gleason **Org:** New York State Energy Office

The NYSEO recommends a fifth option as follows:

1. The text of the actual rule should be modified to include, and each individual relicensing decision should include, statements that the NRC's findings with respect to need for generating capacity and alternative energy sources are only intended to assist the NRC in meeting its NEPA obligations and do not preclude the States from making their own determinations with respect to these issues.

2. Determinations regarding the issues of need for generating capacity and alternative energy sources should be designated "Category 3" conclusions requiring site-specific review, rather than "Category 1" generic conclusions.

3. All NRC project-specific EIS's and relicensing decisions should make reference to State determinations on the issues of need for generating capacity and alternative energy sources, and should defer to and be guided by those State determinations to the maximum degree possible pursuant to NEPA.

Adoption of this option would allow the NRC to satisfy its NEPA obligations without intruding on the State's historic role as regulator of utility resource decisions for all issues other than nuclear safety.

Comment: S007.001
Commenter: A. G. Berwick

Page: 1–2
Org: Environmental Protection Division, Office of Attorney General, Massachusetts

The Massachusetts Environmental Protection Division believes that the questions of need and alternatives cannot be properly addressed on a generic basis and calls for plant-specific analyses at the time an application for relicensing is submitted. Consideration of alternative energy sources should be left until the time of relicensing and undertaken on a plant-specific basis. This will allow for consideration of inevitable technological advances in alternative energy sources, as well as of the particular features of the region that may make alternative energy sources environmentally preferable. Therefore, need and alternatives should be designated as Category 3 issues to be considered on a plant-specific basis at the time an application for relicensing is submitted. (See Comment 059.001.)

Comment: S007.002
Commenter: A. G. Berwick

Page: 2–3
Org: Environmental Protection Division, Office of Attorney General, Massachusetts

The Massachusetts Environmental Protection Division commented that case law developed under the AEA makes it clear that despite the broad preemptive authority given the NRC, States are clearly authorized to make decisions regarding need for power. Furthermore, NEPA does not bar reliance on State determinations concerning energy needs and alternatives. The NRC's Option 2 appears to approximate case law, and NEPA requirements and regulations most closely, although careful consideration will have to be given to the guidelines that will be adopted to implement this option. In addition, it strongly believes that Option 2 should be amended to include a requirement that an EIS prepared at the time of relicensure must contain a statement that it does not preclude, control, or preempt different decisions by the States in the future, closer to the time of the current license's expiration. Likewise, it believes that the rule should also contain a specific statement that any NRC findings with respect to need for generating capacity and alternative energy sources are intended only to assist the NRC in meeting its NEPA obligations and do not preclude, control, or preempt the States from making their own determinations with respect to those issues. (See S004 for comments by PSCW Commissioners.)

Comment: S008.001
Commenter: B. E. James

Page: 2–5
Org: Public Service Commission of Wisconsin

The PSCW continues to be seriously concerned about the potential for inadvertent preemption of State need and alternatives decisions, and has prepared a modified "Option 2," which it believes will meet both State needs and those of the NRC and the EPA. The major elements of the PSCW modified Option 2 proposal are the following:

1. The NRC would adopt some criteria which delineate the attributes of an adequate State IRP process for the purpose of meeting its NEPA requirements. The PSCW suggests that suitable criteria, which have been endorsed by Congress, can be found in the Energy Policy Act of 1992, Section 111(a)(7).

2. The appropriate agency in an affected State would provide the NRC with its analysis of need and alternatives, along with a reviewable "audit trail" of the process the State agency followed to arrive at its conclusions. The NRC would satisfy its "hard look" requirement by reviewing the process and determining whether that process meets the specified criteria adopted under No. 1 above.

3. If the NRC finds that the State agency's analysis meets the established criteria, the NRC would incorporate the analysis into its EIS. (Thus inadvertent preemption problems will be avoided because the State and Federal determinations will never be inconsistent.)

4. If a State does not have an agency to perform IRP or the NRC required analysis, then the NRC would be responsible for taking its own "hard look" to satisfy its NEPA responsibilities.

The PSCW believes that adoption of its proposal will satisfy both the NRC's NEPA responsibilities and the State's right to autonomy on the questions of need and alternatives. The PSCW also believes that none of the options as presently described in the NRC's Staff Discussion Paper is capable of addressing both satisfactorily.

Comment: S009.001 **Page:** 2; 4–5
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies (The Public Utilities Commission of Ohio, The Ohio Power Siting Board, and The Utility Radiological Safety Board of Ohio) are greatly disturbed by the NRC's general approach and apparent intention to delve into the realm of economic analysis regarding need and alternatives. Ohio has every intention of exercising and defending its jurisdiction over matters such as ratemaking, including the prudency and necessity of construction or modification of energy-generating facilities, determination of whether particular supply options are least cost, regulation of significant decisions of utility companies, monitoring of radiological safety issues, approval of power siting proposals (including major refurbishment proposals), and consideration of the environmental impacts of power siting proposals.

Comment: S009.002 **Page:** 2–5
Commenter: Fisher et al. **Org:** Ohio Agencies

With regard to the "preemption disclaimer" which NRC staff has indicated it intends to propose, the Ohio agencies noted that this would merely reflect the existing state of the law and does not represent a significant effort to accommodate State concerns. In order to be meaningful, the disclaimer must be accompanied by other more substantial (i.e., less procedural) efforts to avoid conflicts with State authority.

Comment: S009.003 **Page:** 5–7; 10
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies suggest that the NRC give serious consideration to abandoning any consideration of need for power in perfoming a relicensing EIS. There is nothing that prevents the NRC from taking the applicant's need for operating the plant as a given and treating it as a collateral factor to relicensing. Under this approach, the NRC would evaluate the environmental impacts of licensing as compared with the other alternatives considered and render its decision for relicensure accordingly. The EPA or the CEQ may not be entirely pleased with that course of action. However, the NRC, not the EPA or the CEQ, is responsible for implementing NEPA when relicensing nuclear plants. Thus, a plain reading of NEPA's EIS requirements, as applied to the NRC's relicensing responsibilities, does not necessarily involve a determination of need for power relative to a particular nuclear plant. In sum, NEPA does not require the NRC to do an economic need analysis in relicensing nuclear power plants. Because such an analysis creates the potential for conflict with State jurisdiction over the economic regulation of public utilities and because the U.S. Congress has clearly expressed its intention to leave these matters to the States, the NRC should refrain from delving into this area.

Comment: S009.004 **Page:** 7–8
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies agree that the list of State concerns is accurate, but stress that no concurrent [NRC] jurisdiction on matters of need and analysis of energy alternatives exists. One of the Ohio agencies, the Ohio Power Siting Board, added that many matters addressed as safety and health issues, such as fuel-cycle issues, are also properly reviewed by the States as economic and environmental issues. (This comment is in response to NRC Focus Question No. 1.)

Comment: S009.005 **Page:** 8
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies agree that the changes to the GEIS remove many of the limitations and obstacles to the introduction of new information in the environmental review process, but stress that environmental issues may also be properly addressed by the States in need determinations, energy alternatives analyses, and siting proceedings. (This comment is in response to NRC Focus Question 2.)

Comment: S009.006 **Page:** 8
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies recommend that both the rule and the GEIS state that the need for generating capacity and the analysis of energy alternatives are matters for State determination. (This comment is in response to NRC Focus Question 3.)

Comment: S009.007 **Page:** 8–9
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies disagree with the assertion that need and alternatives are factors in the NRC license renewal decision. In the approach utilized in Option 1, a finding of "inadequate need for generating capacity," based on the NRC's analysis of State forecasting and IRP data, would trigger the wide analysis of economic costs and benefits outlined. Of particular interest to the Ohio agencies is the phrase ". . . geographic area in which each nuclear plant is located . . . " since neither State boundaries nor utility service areas are recognized in need determinations. Ohio has adopted a position in response to NEPA that recognizes a need for regional regulation of electric transmission facilities based on the active participation of impacted States. The Ohio agencies are concerned that a need determination, by a Federal agency in a Federal proceeding, addressing energy needs on a multi-State basis, would not only be preemptive in matters traditionally under State jurisdiction, but would set a dangerous precedent that might spill over into other energy and utility areas of concern. (This comment is in response to NRC Focus Question 4.)

Comment: S009.008 **Page:** 9
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies have every intention of perfoming what is clearly within their jurisdiction—the determination of need and the analysis of energy alternatives for the purposes of ratemaking and facility siting. However, Ohio has no desire to do so under NRC guidelines and with the threat of NRC rejection. (This comment responds to NRC Focus Question No. 5.)

Comment: S009.009 **Page:** 9
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies believe that with the "need" for the capacity assumed to exist in Option 3 (the focus on assessment of alternatives to support the NRC's NEPA review) is perplexing and unnecessary. The analysis of energy alternatives is a matter of State jurisdiction, and acceptance of an individual State's findings by the NRC and inclusion of that acceptance in the NRC's NEPA review should suffice. (This comment is in response to NRC Focus Question No. 6.)

Comment: S009.010 **Page:** 9
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies believe that Option 4 seems to best recognize the relationship between the regulatory authority of the NRC and that of the States. However, comments made in the NRC presentation at the public meeting seem to indicate that Option 4 would involve NRC oversight and retention of control over the economic need analysis. Therefore, the Ohio agencies recommend an "Option 5" (see Comment No. S009.011) if the NRC feels compelled to do any economic need analysis at all. (This comment is in response to NRC Focus Question No. 7.)

Comment: S009.011 **Page:** 9–10
Commenter: Fisher et al. **Org:** Ohio Agencies

The Ohio agencies recommend that the NRC clearly indicate that need determinations, analysis of energy alternatives, and analysis of environmental impact are matters under the jurisdiction of the States. The Ohio agencies recommend the following option:

> Option 5: The determinations of the various States, either separately or jointly, concerning need for generating capacity and alternative energy sources shall be binding on the NRC in operating license renewal matters. To the extent that State economic analysis or determinations have not been completed at the time of relicensing, the NRC should make subsequent State economic approval a condition of the license.

(This comment is in response to NRC Focus Question No. 8.)

Comment: S009.012 **Page:** 10–11
Commenter: Fisher et al. **Org:** Ohio Agencies

If the NRC concludes that it must consider economic need issues, the Ohio agencies recommend implementing the following steps for mitigating harm to the States: (1) include the "preemption disclaimer" language discussed previously; (2) limit economic issues and determinations to the most narrowly-tailored analysis; (3) do not expect or count on the States to do analysis for the NRC or to get involved in these issues (Ohio does not believe that joint analysis with the NRC is beneficial at this time because, to the extent States get involved and take positions, there is a greater likelihood that they will be bound by the outcome or considered to have prejudged the issues); and (4) to the extent States have done economic analysis prior to the relicensing proceeding, the NRC should accept and be bound by the State determination and, to the extent no State analysis has been done, the NRC should condition the license upon State economic approval.

Comment: S010.001 **Page:** 1–2
Commenter: J. E. Doyle **Org:** Attorney General of Wisconsin

The Attorney General of Wisconsin continues to strongly believe that the proposed rule and the generic analysis that it encompasses should not be adopted by the NRC. The questions of need and alternatives cannot possibly be properly addressed on a generic basis. The issues call for plant-specific analyses that can appropriately address the energy needs of and available alternative energy sources in the region at the time an application for relicensure is submitted. Therefore, the issues of energy needs and alternatives should be designated as Category 3 issues to be considered on a plant-specific basis at the time an application for relicensure is submitted. (See Comments S008.001, 060.002.)

Comment: S010.002 **Page:** 2
Commenter: J. E. Doyle **Org:** Attorney General of Wisconsin

The Attorney General of Wisconsin continues to be seriously concerned about the potential for Federal preemption of State determinations of need and alternatives. The case law developed under the AEA makes clear that despite the broad preemptive authority given to the NRC, States are clearly authorized to make decisions regarding the need for power. The States are entitled to set their own energy policy and to make their own determination as to whether there is a need for a particular power source and to determine an appropriate energy mix given State policy objectives. (See Comment 060.007.)

Comment: S010.003 **Page:** 2–3
Commenter: J. E. Doyle **Org:** Attorney General of Wisconsin

As a result of attending the public meeting on February 15, 1994, it is the Attorney General of Wisconsin's understanding that the position of the EPA is that the NRC must "take a hard look" at the need and alternative questions, and reflect the results of that "hard look" in its substantive decision. Therefore, the Attorney General joins with the PSCW in proposing a modification of the "Option 2" approach, which they believe will avoid the danger of improper preemption of State decisions on need and alternatives, while also meeting the NRC's NEPA requirements as perceived by the EPA. The elements of the proposed modified Option 2 are as follows:

1. The analysis of need and alternatives performed by a State that has developed comprehensive IRP is the best source of information on the subject that is likely to exist anywhere, and Federal agencies should rely on that analysis. Therefore, Wisconsin proposes that the NRC adopt criteria which delineate the attributes of an adequate State IRP process for the purposes of meeting the NRC's NEPA requirements. Suitable criteria that have already been endorsed by Congress can be found in the Energy Policy Act of 1992, Section 111(a)(7).

2. The appropriate agency in an affected State would provide the NRC with its analysis of need and alternatives, along with a reviewable "audit trail" of the procedure the State agency followed to arrive at its conclusions. The NRC would satisfy its "hard look" requirement by reviewing the process the State agency used for the analysis and determining whether that process meets the specified criteria adopted under No. 1 above.

3. If the NRC finds that the State agency's analysis meets the established criteria, the NRC will incorporate the analysis into its EIS. Any substantive decision made on these points by the NRC will be based on the State's analysis in the EIS. Any preemption problem will be avoided because the State and Federal determinations will never be inconsistent.

4. If a State does not have an agency that perfoms IRP or other analysis which the NRC requires (i.e., the State cannot meet the criteria), then the NRC would have to fall back on taking its own hard look in some other way that would satisfy its NEPA responsibilities.

In sum, the Attorney General strongly urges the NRC not to adopt its proposed rule and the generic environmental impact analysis encompassed by that rule. However, if the NRC

nevertheless does adopt such a rule, the issues of need and alternatives should definitely be Category 3 issues, and the modified Option 2 approach described above should be considered.

(Note: This is the same comment as S008.002.)

Comment: S011.001 **Page:** 2/3/6/12
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The Pennsylvania Public Utility Commission (PAPUC) believes that Category 1 determinations, which are not subject to further review in individual plant license renewals, substantially eliminate public participation, including participation by State and local governments. The GEIS and the subsequent Staff Discussion Paper oversimplify complex issues. The PAPUC opposes the use of a GEIS in an area as complex and controversial as nuclear energy, and believes that this warrants the numerous requests already received that the proposed rule be withdrawn.

Comment: S011.002 **Page:** 2–3/12–13
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

It is the opinion of the PAPUC that the GEIS and the four options to address State concerns proposed by NRC staff do not go far enough to resolve the issues attendant to Federal preemption of State authority. The PAPUC recommends that the proposed rule and GEIS be withdrawn, or that the NRC adopt a fifth option. This fifth option is an endorsement by the PAPUC of an approach suggested by the NYSEO (see Comment S006.005). This option would require an amendment of the proposed regulation by the NRC, preserving the States' jurisdiction and decision making authority with respect to need and alternatives.

Comment: S011.003 **Page:** 3–4
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC objects to the NRC's presumption of need for nuclear generating capacity and to its extremely narrow assessment of energy alternatives, including alternative generation. "Need" is defined in the GEIS not as a function of demand, but as an amount of generating capacity equivalent to the generating capacity of the subject nuclear power plants; thus, "need" for that capacity is presumed to exist. Further, that "need" is presumed to encompass all 118 operational nuclear power plants which may request license renewal. A generic assumption of "need" without reference to the jurisdiction, and the substantive and procedural concerns of State agencies is a clear intrusion upon State regulatory authority.

If the proposed rule is promulgated in its present form, Federal and State regulatory commissions will be confronted by utilities asserting that the "need" for nuclear generating capacity has already been addressed and answered in the affirmative in a collateral, Federal proceeding, and that State commissions must accept that determination. That is unacceptable and constitutes a further intrusion upon the PAPUC's regulatory authority and responsibility.

Comment: S011.004 **Page:** 4–5/9/10–11
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC believes that the proposed rule and GEIS conflict with the mandatory requirements of several Federal laws. NEPA regulations in 40 CFR 1506.2 require that Federal agencies discuss with relevant agencies any inconsistency of a proposed plan with any approved State or local plan or laws. It would be virtually impossible for the NRC to comply with this requirement if a GEIS is promulgated that precludes meaningful participation by the States and is binding on all nuclear facilities into the next 20 years.

The NRC appears to have considered neither IRP mandates of the Energy Policy Act of 1992, nor the Public Utility Regulatory Policies Act of 1978.

In passing the AEA, and in subsequent amendments, Congress intended that the States retain their traditional responsibility in regulating electric utilities for determining questions of need, reliability, cost, and other related State concerns. Assessment of need is a traditional State regulatory function. The U.S. Congress formalized this regulatory authority in enacting the Energy Policy Act of 1992 when it encouraged the States to implement IRP.

Comment: S011.005 **Page:** 5
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC believes that a generic finding with respect to need and the proper "mix" of alternate energy sources presupposes specific forecasting and utility expertise that is beyond the experience and jurisdiction of the NRC, and is in violation of least cost planning (LCP) and IRP principles.

Comment: S011.006 **Page:** 6–8
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC believes that the NRC preemption of State authority is not relieved by disclaimers contemplated to date or by the four options set forth in the NRC Staff Discussion Paper. It finds none of these options acceptable for the following reasons:

> Option 1 does not relieve States' preemption concerns at all, rather this option formalizes that preemption by expressly attempting to replicate State-level adjudications and analyses.
>
> Option 2 encroaches upon State jurisdiction by reasserting that need and alternatives are factors in an NRC license renewal decision, and by implying that a State's analysis and determination of need and alternatives must meet NRC guidelines. Obviously, the NRC is not the review authority for State action, nor could any State Commission, or review court for that matter, acquiesce in such a proposition which, at best, renders State regulation an adjunct to an ultimate Federal decision making process.
>
> Option 3 is really not an option at all. It merely confirms the NRC's approach to "need" as a presumption that all nuclear generating capacity is needed. This "generic" conclusion is

not acceptable as need is determined at the State level, and the NRC should defer to and be guided by State decisions in that regard to the maximum extent possible under NEPA.

As explained in the Discussion Paper on page 11, what the NRC is contemplating in Option 4 is that need for power and alternative energy sources will be considered for "disclosure purposes" only, and will not be cited as a factor in the NRC's decision on whether to renew a license. Need, however, will still be addressed in the GEIS to demonstrate that, " . . . the policy on which this [the GEIS] is based is reasonable." This option, while superficially attractive, does not go far enough to confirm that the NRC is not preempting the States in their regulatory responsibilities. A much stronger, more unequivocal statement, such as "Option 5" proposed by the NYSEO (See Comment S006.005), is needed.

Comment: S011.007 **Page:** 8–9
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC observed that the NRC Discussion Paper and options presuppose that an economic justification for relicensing nuclear facilities could be sustained, generically, if it can be shown that the alternatives to relicensing would involve the construction of new capacity so that the capital costs of constructing the alternative would outweigh the refurbishment costs associated with relicensing. NRC staff presumes that any "new capacity" would be a new, coal-fired plant. NRC staff seems to have an implied bias against "dirty" coal-fired energy, but that bias does not consider the impact upon coal-fired plants of key, related legislation, such as the Clean Air Act, in making a cost-benefit analysis. NRC staff does not consider the possibility that "new capacity" may also be fueled by relatively clean natural gas or based on renewable energy technology.

Comment: S011.008 **Page:** 9–10
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

As indicated in Comment S011.004, the Energy Policy Act of 1992 contains IRP mandates. The PAPUC has issued a policy statement on energy supply alternatives consistent with IRP principles:

> The Commission [PAPUC] believes that energy supply alternatives such as conservation, load management, and alternate energy supply products are viable supply options which must be considered by the jurisdictional electric utilities as alternatives to capacity expansion and to reduce operating costs.

IRP is a dynamic process that takes place in annual, not 20-year, increments. In considering alternate energy sources, IRP is not based on coal-fired plants as the only, or even as the most likely, source of new generation capacity. It must be updated on a regular basis with an opportunity for public participation and comment.

Comment: S011.009 **Page:** 11
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The PAPUC believes that the NRC's Discussion Paper makes an extremely generalized and purely economic cost-benefit analysis that is based on unsupported presumptions and weighted heavily in favor of relicensing nuclear facilities. This result-driven analysis does not comport with the site-specific review contemplated under the NRC's current regulations. Further, this analysis continues to intrude upon State jurisdiction over utilities in need and alternate energy assessment.

Comment: S012.001 **Page:** 1–2; 9
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

Although the Massachusetts Department of Public Utilities (MDPU) supports the concept of reducing regulatory duplication inherent in the GEIS approach, it shares similar concerns as those noted in the NRC Staff Discussion Paper as they relate to need and alternatives. Nonsafety-related components of the review process historically have been overseen by the States and, under current IRP approaches to regulation of the electric power industry, it is important for the States to retain this oversight. "Need" and "alternatives" pertain almost exclusively to plant economics and are inexorably linked to the resource planning processes that are properly within the jurisdiction of the States.

Comment: S012.002 **Page:** 2; 3
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

The MDPU believes that, in fulfilling its obligations under NEPA, the NRC should recognize that State IRP proceedings represent the appropriate forum and most effective means by which to resolve issues of need and alternatives, and that the NRC should pursue opportunities to rely on State planning processes. The MDPU also noted that the regulations promulgated by the CEQ require cooperation with State and local agencies "to the fullest extent possible to reduce duplication" (see 40 CFR 1506.2). Further, the MDPU noted that this approach was adopted by the EPA in its review of the environmental assessment (EA) for the Taunton Energy Center in Taunton, Massachusetts, whereby the EPA deferred to a Massachusetts agency on the issue of need for the "new source," noting that the State review process is rigorous, site-specific, and complements the EPA's role in project review on the issue of energy needs and other issues.

Comment: S012.003 **Page:** 2–3; 12–13
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

The MDPU urges the NRC to adopt license renewal regulations that will permit it to rely on State review processes with respect to issues that are within the States' jurisdiction. In particular, the NRC should restrict any proposed rule changes that would incorporate a GEIS approach to only those issues that are clearly applicable to all affected nuclear power plants, and to defer to the individual States on the review of need and alternatives as they relate to the relicensing of specific nuclear power plants. Such an approach could be accomplished using Options 2, 3, or 4 as set forth in the Staff Discussion Paper; however, Option 4 would be the most appropriate choice.

Option 4 should be modified, however, to permit the NRC to defer the evaluation of need and alternatives to affected States if the NRC can find that the States will evaluate these issues within the context of IRP proceedings.

Comment: S012.004 **Page:** 3–4
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

The MDPU believes that independent assessments of need and alternatives by the NRC would be inconsistent with IRP principles and law. Judicial precedent dictates that the States have a primary right to evaluate decisions regarding the inclusion of new and continuing resources in an electric company's resource portfolio.

In the Energy Policy Act of 1992, Congress has recognized the importance of IRP in energy policy and the authority of States in this area by encouraging all States to implement IRP processes. (Massachusetts had already implemented IRP prior to passage of this Act, and several years ago enacted a comprehensive set of regulations.) In implementing their obligations under this Act, the States will address the need for, and alternatives to, continued operation of nuclear power facilities. Therefore any similar effort by the NRC would, at best, represent unnecessary and duplicative regulatory efforts.

Comment: S012.005 **Page:** 5–8
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

The MDPU believes that for the NRC to conduct independent assessment of the need for, and alternatives to, a particular facility outside of any IRP process could lead to inappropriate results and undemine the emerging competitive wholesale generation market. First, the need for a power plant cannot be accurately projected decades in advance; resource alternatives and their environmental and other characteristics also cannot be known. Second, it is not necessary for the NRC to seek to predict the need for a facility years in advance of the expiration of its operating license because the emerging competitive wholesale generation market offers "real-time" solutions to questions of need and alternatives. If a facility is needed, it will be able to secure power sales contracts at the time that it is needed.

State IRP processes often establish frameworks by which an electric company can routinely "test" the need for various existing and new resource options against alternatives available in the competitive wholesale generation market. Massachusetts' regulations require jurisdictional electric companies to assess the need for additional capacity across a planning period that is limited to 10 years; importantly, new need projections must be submitted every 18 to 30 months. Therefore, these regulations make accommodation for the routine reassessment of the need for, cost-effectiveness of, and alternatives to existing generating facilities, pursuant to established standards.

Comment: S012.006 **Page:** 8
Commenter: Gordon et al. **Org:** Massachusetts Department of Public Utilities

The MDPU believes that independent assessments of need and alternatives by the NRC would be impractical for the nuclear facilities serving New England because individual nuclear power facilities operating in New England often meet the needs of customers of several electric companies in different States. To accurately assess need and alternatives for any given facility would thus require an evaluation of the needs and alternatives of several electric companies from different State jurisdictions. It is unlikely that an accurate assessment of the needs and alternatives of the several companies that receive power from such a facility could be achieved by the NRC without analyses from the various State commissions.

Comment: S013.001 **Page:** 1
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

[NOTE: This docket contains only a response from the NRC to YAEC indicating that the March 4, 1994, close of the comment period will not be changed. See Docket S018 for YAEC comments subsequently submitted.]

Comment: S014.001 **Page:** 1
Commenter: A. Nogee **Org:** Massachusetts Public Interest Research Group

The Massachusetts Public Interest Research Group (MASSPIRG) filed joint comments with the Massachusetts Citizens for Safe Energy on October 15, 1990, and adopts those comments by reference. The MASSPIRG also endorses the written comments of the NYSEO, and the Minnesota State agencies.

Comment: S014.002 **Page:** 2–4
Commenter: A. Nogee **Org:** Massachusetts Public Interest Research Group

The MASSPIRG believes that nuclear plant license renewal cannot be generically found to be a least-cost option, especially at this time. The MASSPIRG agrees with the characterization by the NYSEO that making generic, as opposed to site-specific, assumptions about the need for generating capacity and alternatives is "ridiculous." Moreover, the NRC's proposed generic finding is inconsistent with a 1988 analysis by the Energy Information Administration of the DOE, entitled *An Analysis of Nuclear Power Plant Operating Costs* (DOE/EIA-0511), dated March 1988, which concluded:

> Continued escalation in operating costs could erode any cost advantage that operating nuclear power plants now have . . . If operating costs continue to escalate, it may become economical to close some of the older plants, and thus the assumption of a 40-year operating life may be optimistic."

Furthermore, the MASSPIRG's own plant-specific analyses of the cost-effectiveness of continued operation versus retirement of the Pilgrim nuclear station in 1987 (added as Attachment 1 to these

comments) and of Yankee Rowe—along with the relatively recently announced early retirement of five nuclear units—also demonstrate the impossibility of reaching such a generic conclusion. In 1988, the MASSPIRG analyzed the costs and benefits of continuing to operate the Yankee Rowe nuclear plant, and found that retiring the plant would save $114 million to $267 million, net present value (Attachment 2).

Moreover, a recent MASSPIRG examination of the contract costs of new coal plants that have been proposed to serve Massachusetts ratepayers shows that they would be more expensive than utility energy efficiency programs, contracts with a proposed Maine wind energy farm, proposed landfill gas plants, proposed biomass plants, proposed small hydro development, and proposed natural gas combined-cycle plants (Attachment 3). Indeed, in the most recent utility Request for Proposals, coal plants have finished no higher than third from last of 35 to 40 proposals.

For all these reasons the MASSPIRG suggested, at the Chicopee hearing, that the proposed generic finding on the need for and cost-effectiveness of nuclear license extensions would destroy the NRC's credibility with infomed citizens and with State governments.

Comment: S014.003 **Page:** 4–5
Commenter: A. Nogee **Org:** Massachusetts Public Interest Research Group

The MASSPIRG believes that the NRC cannot ignore the NEPA requirement to find that proposed license extensions are needed and are the most economical alternatives. The MASSPIRG concurs with the many State officials who commented on the authority of State utility regulators to approve or to disapprove utility generating plans on economic grounds. In most cases, States are likely to have more resources and expertise to evaluate these issues. It would be reasonable for State reviews to precede NRC reviews, therefore, and perhaps for the NRC to adopt the records of State proceedings. However, interested parties must retain the right to present new or additional evidence and to argue before the NRC on the issues of need and alternatives.

Comment: S014.004 **Page:** 5
Commenter: A. Nogee **Org:** Massachusetts Public Interest Research Group

The MASSPIRG agrees with the proposal by the liaison officer of the State of New York at the Chicopee hearing (see details on proposed Option 5, Comment S006.005).

Additionally, the MASSPIRG would add the following: Need for capacity and alternatives decisions must be made as close to the date of the license renewal as possible and must rely on the best information available at that time.

Comment: S015.001 **Page:** 1
Commenter: W. L. Stewart **Org:** Virginia Power

Virginia Power supports the current Part 51 rulemaking to improve the efficiency of environmental review, and agrees with the NRC's initiative to identify and codify generic environmental issues that pose no significant impact in a GEIS. Virginia Power also agrees that

the nuclear industry has extensive operating experience that allows the evaluation of the types and magnitude of environmental impacts associated with license renewal and extended operations. Finally, Virginia Power agrees with the findings in the GEIS that license renewal is needed and is environmentally preferable.

Comment: S015.002 **Page:** 2–3
Commenter: W. L. Stewart **Org:** Virginia Power

Virginia Power noted that in SECY-93-032 and during the public workshops, it was reported that the NRC had reached an agreement with the CEQ and the EPA on major Part 51 procedural concerns. It was agreed among the agencies that a site-specific SEIS, rather than an EA, will be required for each license renewal proceeding. According to this agreement all environmental issues, regardless of their generic resolution in the GEIS, will need to be addressed as part of the site-specific environmental reviews and will be subject to public comments. Litigation of generic environmental issues is also facilitated as a result of the agreement. Virginia Power urges the NRC to strive to make the maximum possible utilization of the GEIS, and to minimize the number of issues to be addressed on a site-specific basis. This is a major change from the NRC's original intent in the proposed rulemaking to allow for the use of an EA and a finding of no significant impact (FONSI). Virginia Power opposes this apparent reversal and strongly urges the NRC to proceed with the proposed change to 10 CFR 50.20(b)(2) provided in 56 FR 47016 dated September 17, 1991. Further, Virginia Power recommends that the NRC implementing regulation, 10 CFR Part 51, be revised to allow the NRC to prepare either an EA or an EIS, depending on site-specific information, for the following reasons:

1. The NRC has apparently reversed its position based exclusively on the comments received from EPA and the CEQ while not considering other comments received in favor of the proposed rule change. The NRC has the flexibility it needs to allow for extensive public participation without requiring an SEIS for all license renewal applications, and the EA could be issued in draft form for public review and comment before a FONSI determination or decision to prepare an EIS is made.

2. The EA/FONSI process is a significantly more efficient environmental review process than the EIS process.

3. Licensees may choose to apply for renewal periods that are substantially less than the 20 years allowed by the regulations. This is not directly recognized by the regulation, but would tend to make a FONSI determination even easier to reach. (Virginia Power is actively pursuing a 5-year renewal initiative for the North Anna and Surry Power Stations. Its initial analysis indicated that there should be no adverse environmental impacts. Therefore, Virginia Power believes that an EA/FONSI would be an appropriate determination for its license renewal.)

Comment: S016.001 **Page:** 1
Commenter: F. J. Murray, Jr. **Org:** New York State Energy Planning Board

While the New York State Energy Planning Board (NYSEPB) appreciates the attempts made by the NRC Staff to address the concerns raised by New York and other States in their initial comments, it does not believe that its major concerns are adequately resolved by the modifications and four options discussed in the NRC Staff Discussion Paper. New York proposes a new "Option 5" (see Comment S006.005) in lieu of the 4 options presented by the NRC. The NYSEPB believes that Option 5 would allow the NRC to satisfy its NEPA obligations without intruding on the States' historic role as regulator of utility resource decisions for all issues other than nuclear safety. The NYSEPB urges the NRC to modify its proposed rules and adopt New York's proposed Option 5 in its entirety.

(See Docket S006 for the rest of New York's comments.)

Comment: S017.001 **Page:** 1–2
Commenter: Craig/Visnesky **Org:** Illinois Commerce Commission

The Illinois Commerce Commission (ICC) continues to be concerned that the proposed rule would make generic conclusions for two of the most controversial aspects of the EIS: those being a finding of "need for" and "economic benefit" of the relicensed nuclear capacity, decades early, for all 109 commercial nuclear generating stations eligible for license extension. Site-specific EISs only address issues not previously "resolved" by the proposed rule and associated GEIS. Once the generic determinations are made, those issues cannot be reopened without encountering problematic rulemaking procedures or an evidentiary demonstration of new and significant information. This situation shifts the NRC's burden of environmental disclosure to the States and the public. Even though the State commissions may be able to meet this burden, it requires a significant investment of resources by the States.

Comment: S017.002 **Page:** 2–3
Commenter: Craig/Visnesky **Org:** Illinois Commerce Commission

The ICC believes that the proposed rule encroaches on, or at a minimum erodes, the State's authority over the determination of the need and economic efficacy of future capacity acquisition decisions as required under Sections 8.402 of 83 of the Illinois Public Utility Act (LCP law). Designation of need and alternatives as Category 1 issues completely disregards the States' traditional role and the ICC's specific statutory requirements in the determination of need for new resources. This situation creates two problems. First, the NRC's generic determinations in this rulemaking may become presumptive findings in subsequent utility or State LCP or IRP proceedings. Second, States may be forced to intervene in the NRC proceedings at the time of each individual nuclear power plant relicensing application if the GEIS determinations regarding need and alternatives differ from those approved by the State public utility commission. The resolution of key differences between findings in State proceedings and prior NRC determinations would impose significant administrative burdens on the State commissions in both Federal and State court proceedings. The NRC's stated intention not to preempt State authority is of little

solace to States who must fund intervention in Federal proceedings or appeal orders in State or Federal courts even if the State should ultimately prevail.

(This is similar to Comment S001.002.)

Comment: S017.003
Commenter: Craig/Visnesky

Page: 3
Org: Illinois Commerce Commission

The ICC believes that the proposed rule is lacking in full environmental disclosure to the NRC Commissioners and the public as required by NEPA. Failure to rely on State LCP, IRP, or similar proceedings neglects the most timely and complete information available regarding need and selection of capacity alternatives. Information from State environmental reviews under their "mini NEPAs" or existing State environmental policies is also excluded. In addition to full disclosure of environmental information, NEPA requires public participation in the development of the information itself. The proposed rule fails to encourage public input and participation in the NRC's environmental review process by not incorporating State LCP, IRP, or similar processes, which were largely developed to improve public participation in the review of utility resource acquisition decisions. The ICC believes that States who have implemented IRP processes and those which will do so under the Energy Policy Act of 1992 requirements should be given deference by the NRC as having fulfilled the public review process of NEPA.

(This is similar to Comment S001.003.)

Comment: S017.004
Commenter: Craig/Visnesky

Page: 2–4
Org: Illinois Commerce Commission

The ICC recommends that the following modifications to the proposed rule be adopted:

1. Redesignation of need and alternatives as Category 3 (site-specific evaluation and findings required) issues to be considered fully by the NRC in its environmental review of individual nuclear power plant relicensing applications.

2. Implementation of an environmental review process whereby the NRC (1) fully considers the evidentiary record developed in State LCP, IRP, or similar proceedings, including supporting data and analysis, as the most complete and timely information available regarding need for and alternatives to new resources, and (2) accords substantial weight to State determinations in those proceedings.

3. Inclusion of an explicit statement in the body of the proposed rule that the rule in no way preempts State jurisdiction over the determination of the continued need for specific nuclear power plant capacity, and that NRC consideration of need for and alternatives to capacity does not constitute a "rebuttable presumption" that the capacity is required and can be considered to be the most economical of alternative capacity options available. The NRC's

consideration of need and alternatives would only be intended to fulfill its environmental review duties as required under NEPA.

(Same Comment as S001.005.)

Comment: S017.005 **Page:** 4–5
Commenter: Craig/Visnesky **Org:** Illinois Commerce Commission

The ICC wishes to assuage any concerns that parties may have regarding the State LCP or IRP process as being de facto anti-nuclear. Although Illinois law requires that all initial sources of new supply come from conservation, demand side management (DSM), renewables, or purchased power, it also requires that the selected options be least cost, efficient, reliable, and environmentally safe.

Comment: S018-A.001 **Page:** 2
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

The YAEC believes that, among the options presented, Option 4 would best meet the position that regulation of the issues of need and alternatives should remain within a State's energy planning jurisdiction. However, that explicit option may not be entirely sufficient for some States. YAEC's concern is that by inclusion of those issues in this NRC review, even merely for disclosure purposes, licensees could be in the position, as has been the case in the past, of having to address these same issues in multiple regulatory venues. The multiple review occurs irrespective of whether the rate setting or generation planning regulator is a State public utility commission or the Federal Energy Regulatory Commission. To be forced to visit these same issues more than once is, in YAEC's view, redundant regulation and an unwarranted expense for both utilities and the public.

Comment: S018-A.002 **Page:** 2–3
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

The YAEC believes that the NRC can fulfill its obligations even if it does not consider the issues of need for power and alternative sources of energy presented in the GEIS. The YAEC believes that the apparent divergence is a result of mischaracterization of what the major Federal action really is in this case. In actuality, the facility is in place and is being used to produce needed electricity. If it were not, the applicant would not be seeking to renew the license. The renewal by the NRC merely enables the licensee to preserve the option for continued use of the facility for consideration by the State regulatory and energy planning agencies. They, in turn, will consider the continued use of the facility in the context of their ongoing demand projections and the availability of alternatives to fulfill projected needs. The purpose of the GEIS remains to identify all relevant impacts and to categorize these in terms of significance, as it does quite well. The scope of the Federal action in this instance should be recognized as a permissive step to facilitate the exercise of an option provided that no unacceptable adverse environmental impacts exist. In this context, the disclosure and consideration of need and alternatives, as presented in the GEIS, are beyond the scope of the decision and need not be presented in the GEIS.

Comment: S018-A.003 **Page:** 2–3; 12–13
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

The YAEC pointed out a technical shortcoming of the GEIS: it assumes a renewal scenario of a major plant shutdown and a 9-month retrofit period prior to the resumption of operation under the renewed license. The existing license renewal rule (10 CFR Part 54) and the February 3, 1994 NRC directive for its revision are both focused on the continuation of operation in an uninterrupted manner. Indeed, the issuance of the Maintenance Rule (10 CFR 50.56) is cited as a fundamental acknowledgment of the adequacy of the continued operation of the facility unchanged into the renewal period. By recharacterizing the nature of the NRC decision to one which enables the exercise of an option to continue, the flawed balancing analysis, which has included this grossly incorrect shutdown assumption, can be avoided. Such a change materially improves the accuracy, and thus the credibility of the GEIS.

Comment: S018-B.001 **Page:** 2–8; 14
Commenter: J. Gallo **Org:** Gallo and Ross

Gallo and Ross prepared a Memorandum of Law to address how the NRC might implement Option 4 from the NRC Staff Discussion Paper in a manner that satisfies the objections of the States. Gallo and Ross contend that most States participating at the February 1994 Part 51 workshops supported Option 4 because it would limit the application of the need for power and alternative energy sources discussions required to satisfy the NEPA disclosure mandate. No conclusions on these issues would be made in the final GEIS under Option 4.

The removal of the information found objectionable by the States can be justified by relying on the actual purpose of the proposed Federal action, namely, to establish a stable license renewal process to preserve, for future consideration by licensees and State energy planners and regulators, the option of operating nuclear power plants beyond current license terms. This restatement of purpose leads to the logical conclusion that only the "no action" alternative need be evaluated in the GEIS, and that the only "need" discussion necessary is an explanation of the reasons for preserving the license renewal option.

Gallo and Ross believe that the GEIS's statement of purpose should be:

> S.2 Purpose
>
> The agency's Part 54 and Part 51 rulemaking and the preparation of this GEIS are components of the proposed Federal action to establish a reliable and predictable license renewal process for the purpose of preserving for licensees and their State regulators the option of operating nuclear power plants beyond current license terms. This GEIS was prepared, as part of this goal, to simplify the NEPA process for license renewal. The findings of generic impacts, that are identified and completely evaluated in the GEIS, would be codified in 10 CFR Part 51 so that they may be applied with limited further analysis in future environmental reviews for renewal at individual plants.

The GEIS was not written to evaluate the environmental impacts of the Part 51 rulemaking itself. It was written to evaluate, categorize, and codify in Part 51 the generic environmental impacts of

continued operation during the renewal periods of 118 nuclear power plants. This action would avoid duplicative licensing work in individual license renewal applications, and thereby, contribute greatly to the overall goal of creating a reliable and predictable licensing process to preserve future options.

Option 4 can be adopted provided the statement of purpose in the final GEIS is restated as discussed above. This necessarily would eliminate the States' objections since the alternative energy source and need determinations in the draft GEIS can be omitted from the final document.

Comment: S018-B.002 **Page:** 8–9
Commenter: J. Gallo **Org:** Gallo and Ross

Gallo and Ross state that given the actual overriding purpose of the GEIS (see Comment S018-B.001), the only alternative that logically must be discussed in the GEIS is the no action alternative. This finding should be made in the final GEIS and codified in Part 51 as a Category 1 item. The "alternatives," discussed in the draft GEIS, need not be evaluated because they would not preserve the license renewal option. Simply stated, the employment of other generation sources and DSM measures as alternatives will not preserve the nuclear plant license renewal option for future consideration by plant licensees and their state regulators and energy planners. Thus, these alternatives are irrelevant to the NRC's actual purpose.

Comment: S018-B.003 **Page:** 10–11
Commenter: J. Gallo **Org:** Gallo and Ross

Gallo and Ross believe that the NRC must establish a need for the proposed Federal action as revised (see Comment S018-B.001). In doing so, Chapter 8 should be rewritten to delete (1) information and conclusions concerning the need for renewed plant operations to meet future energy needs of the country, and (2) the assumption that existing capacity provided by nuclear plants will be needed after the licenses for such plants expire. Instead, the NRC should discuss the reasons why it is prudent and necessary to preserve the option of providing future energy capacity from the license renewal of nuclear plants. This evaluation would include energy need projections to about 2030, based on nationwide information developed by the DOE and other experts in the field. The discussion would serve the limited purpose of showing that some level of energy production beyond capacity without the 118 nuclear plants is likely to be needed. Notice could be taken, based on the work done by the pilot-plant owners, the owners groups, other utilities, and the NRC's NPAR program, that plant refurbishment for renewed license purposes is likely to involve a modest increment of capital investment in the course of normal operation. This would suggest that a renewed plant <u>may</u> be a low-cost source of future energy generation. Based on these premises, it is both reasonable and necessary to preserve the license renewal option for future consideration. This conclusion should be designated in the final GEIS and codified in Part 51 as a Category 1 item.

The final GEIS could also disclose a general description of the present and changing state of the electric utility industry. This could include the recent aggressive actions of State regulators to meet future energy needs through competitive means and DSM measures, the introduction of IRP

nationally under the Energy Policy Act of 1992, and the trend of utilities to merge and reorganize to meet competition from independent power producers and others.

Comment: S018-B.004
Commenter: J. Gallo

Page: 11–13
Org: Gallo and Ross

Gallo and Ross believe that the NRC's construction permit model for evaluating need for power and alternative energy sources will not work for license renewal because license renewal is quite a different proposed action. Renewed operating licenses will be obtained generally 15 or more years before existing reactor operating authority expires. No commitments or intentions to operate beyond 40 years will have been made by that time by nuclear plant licensees, and State regulators will not have decided whether or not to permit such continued operation. Indeed, none could be made. Licensees must first make the case for continued operation beyond 40 years to State regulators and energy planners, a process that will not occur until years after renewed licenses are issued.

The NRC proposed Federal action is intended to assure, by early licensing, that its renewed licensing requirements do not become critical path obstacles to the use of an otherwise economically-preferable asset as a future source of energy. Thus, it is entirely reasonable for the NRC to structure its NEPA process to coalesce with this goal. Furthermore, any perceived departure from agency practice and guidance (implicitly, from Part 51 itself), governing the NEPA review requirements for a construction permit, would not represent arbitrary and capricious agency action as long as a reasonable basis for change exists. That basis exists for license renewal.

Comment: S019.001
Commenter: D. W. Edwards

Page: 2–3; 4
Org: Yankee Atomic Electric Company

The YAEC urges the NRC to proceed with its originally proposed change to 10 CFR 50.20(b)(2), allowing for the preparation of an EA, a FONSI if no significant environmental impacts were found, and preparation of an SEIS only if a FONSI cannot be made. The YAEC is greatly disappointed to see the apparent reversal of this position as a result of private agreements reached between the NRC, EPA, and CEQ, and urges the NRC to make the best possible use of the GEIS to minimize the number of issues to be addressed on a site-specific basis to those for which the potential exists for a significant impact.

The YAEC believes that as a result of SECY-93-032, the proposed process is now the old, costly, time-consuming process of repetitive and duplicative EISs for a full range of potential issues, and that a great deal has been lost. The YAEC believes that the NRC has the flexibility it needs to allow for extensive public participation, without requiring an SEIS for each license renewal application. The scope of issues selected, based upon the expert knowledge contained in the GEIS, and the simplified process of the EA can be used to optimize the NRC's and therefore the public's cost to achieve this review. An EA which permits public review and comment at the draft stage is the right approach.

[Note: These and the following are YAEC's supplemental comments, which are similar to the S015 comments. See S018-A and B for YAEC's comments specific to the treatment of need and alternatives.]

Comment: S019.002 **Page:** 2
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

The YAEC noted that apparently some within the [NRC] staff expect that most EAs would result in the need for an EIS. The YAEC disagrees, and expects that many EAs would result in a FONSI because the significant impacts—those associated with construction—have been absorbed and the impacts of plant operation are relatively benign. The YAEC believes that even the issue of endangered species is likely to be less significant than perceived because most plants that would be seeking renewal have conditions or restrictions in their licenses intended to mitigate impacts on sensitive plant and animal species. The YAEC believes that the GEIS, prepared specifically to identify and catalogue the impacts of the hundreds of reactor years of experience, supports the view that little ongoing impact is occurring to specific species or the environment in general. Even if there is a new concern for an existing species or new species that have inhabited the local region, an EA could highlight the need for additional study for the few cases needing it.

(See Comment S015.002.)

Comment: S019.003 **Page:** 3
Commenter: D. W. Edwards **Org:** Yankee Atomic Electric Company

The YAEC believes that the GEIS is unrealistically conservative in that a 9-month refurbishment shutdown is assumed prior to operation under the renewal license. This is a flaw that should be corrected because it is philosophically inconsistent with the underlying premise of 10 CFR Part 54.

Comment: S020.001 **Page:** 1
Commenter: R. W. Bishop **Org:** Nuclear Energy Institute (formerly NUMARC)

The Nuclear Energy Institute (NEI) believes that a focused and efficient environmental review, limited to pertinent considerations and aided by generic findings where practical, is very important to ensure that license renewal is a reasonable, stable, and predictable process. While the NEI suggests that the NRC can and should modify its NEPA review of need for power and alternative energy source issues, the NRC should retain the approach set out in the proposed amendments to Part 51 and the GEIS for license renewal.

Comment: S020.002 **Page:** 2; Encl-6
Commenter: R. W. Bishop **Org:** Nuclear Energy Institute (formerly NUMARC)

The NEI believes that none of the four options identified by the NRC would fully resolve the States' expressed concern that the NRC will make findings inconsistent with subsequent State

utility planning decisions and infringe upon the States' traditional authority to regulate public utilities. Therefore, the NEI is proposing an approach that is consistent with the intent and requirements of NEPA while satisfying the States' desire to make clear their primacy in the area of economic regulation. After reviewing applicable case law, the NEI believes that the NRC may eliminate from its NEPA review consideration of need for power and alternative energy sources based on two fundamental principles of NEPA. First, an agency need only consider reasonable alternatives, not remote and speculative alternatives. (At the time of license renewal application, which may be filed up to 20 years prior to expiration of the original license, alternatives to an existing nuclear plant's continued operation during the period of extended operation are remote and speculative, and lacking sufficient information for any further meaningful inquiry.) Second, with the exception of the no action alternative, an agency need not consider alternatives that do not serve the purpose of the proposed action. *Citizens Against Burlington, Inc. v. Busey* holds that consideration of a no action alternative is lawful.

State regulation of the need for and choice of generating capacity is clear. As a practical matter, the NRC can neither duplicate nor predict State decision making. Finally, need and the relative impacts, benefits, and costs of alternatives constantly change. In the same vein, State regulatory decision making is a continuing process, particularly with the advent of IRP under the Energy Policy Act of 1992.

Thus, the NRC should not define its proposed action in any manner suggesting that it is making such a determination, or that such a determination is a goal. Instead, the NRC should define the proposed action as renewing the specific facility license in order to make continued operation one option that the State might allow in the future. In addition to the no action alternative, the NRC should consider only those alternatives that serve this purpose. The NRC is only considering whether a specific nuclear facility may be safely operated during the period of extended operation—not whether it will operate.

[Note: There is considerable discussion in the docket of cited court cases in defense of NEI's recommended approach.]

Comment: S020.003 **Page:** Enc 6-8
Commenter: R. W. Bishop **Org:** Nuclear Energy Institute (formerly NUMARC)

The NEI believes that of the four options, only Option 1 (if properly implemented) appears feasible. However, it would still require consideration of matters that the NEI believes are not required by NEPA and would not eliminate entirely the potential for conflicting NRC and State decisions. Option 1, as the NEI suggests modifying it below, is therefore considered second-best to its recommendation (see Comment S020.002). Options 2 and 4 are legally infirm and would not accomplish the States' objective. Option 3 accomplishes so little as to be easily dismissed.

If the NRC does not accept the NEI's recommendation, the only practical way to respond to State concerns to minimize conflict between the NRC and State decisions is to make the NRC's decisions on need for power and alternative energy source issues as generic and limited as possible. Narrow, generic findings (in effect, general presumptions) in the GEIS are less likely than detailed, plant-specific findings, to create conflict or interfere with subsequent State determinations.

Option 1 offers a framework that, while less desirable than the NEI's recommended approach, is a potentially reasonable approach if the NRC were to decide that it must consider need and alternatives. Option 1 correctly recognizes that NEPA does not require the NRC to analyze economic issues unrelated to environmental impacts or to consider in any depth alternatives that are not clearly environmentally superior to the proposed action. NEPA imposes no obligation on a Federal agency to engage in LCP. Thus, economic analysis should not be a consideration unless an environmentally superior alternative is defined.

If there is no reasonable, environmentally preferable alternative, need for the capacity is an adequate qualitative justification for the action without further economic analysis. The significant cumulative effects factor triggering economic analysis in Option 1 should therefore be dropped. If the proposed action does not involve significant cumulative environmental impacts, NEPA does not require and the NRC should not be preparing an SEIS at all. Conversely, a court might assume that preparation of an SEIS reflects the NRC's judgment that the effects are cumulatively significant, in which case economic analysis might always be required under the third factor of Option 1.

Option 1 may be applied to the GEIS to eliminate unnecessary economic analysis and simplify the conclusions. In essence, the GEIS could be revised to support two Category 1 presumptions: (1) that existing capacity is needed; and (2) that there is obviously no environmentally superior alternative to the continued operation of a nuclear unit. These presumptions would suffice to avoid complicated economic analysis, would make no conclusions on economic issues that might be decided in State IRP or LCP proceedings, and would therefore have minimal impact on State deliberations.

However, this option would not eliminate the States' concerns altogether. Moreover, such an approach might still result in a full economic inquiry by the NRC in cases where an intervenor or commenter provided significant new information. Consequently, while Option 1 as applied to generic Category 1 findings in the GEIS would be a step in the right direction, it would not go far enough to eliminate the potential controversy between the NRC and the States.

Comment: S020.004 **Page:** Enc 8-10
Commenter: R. W. Bishop **Org:** Nuclear Energy Institute (fomerly NUMARC)

The NEI commented that States' interest in Option 2 at the public meetings apparently stemmed from the mistaken belief that a State's analysis could be adopted by the NRC in such a manner as to insulate it from challenge. Such an approach is clearly unlawful under NEPA. In *Calvert Cliffs Coordinating Committee v. AEA*, the Court held that NEPA's broad mandate requires the NRC to make its own independent evaluation of the applicable environmental factors and does not allow it to defer to certifications by other agencies. The Court also held that the NRC may not insulate an EIS from review by the Atomic Safety Licensing Board (ASLB) in licensing proceedings. A procedure that would adopt a State's analysis without independent review by the NRC and adjudication before the ASLB would clearly violate NEPA.

Unlike the industry's recommendation, Option 2 fails because it assumes that need for power and alternative energy source issues are matters that must be considered in the NRC's NEPA evaluation, and then attempts to avoid such consideration. The industry's recommendation, on the

other hand, determines that these issues need not be considered because of the limited purpose of the proposed Federal action. The existence of subsequent State decision making simply limits the effect and purpose of the NRC action. It supports the reasonableness of the industry's recommended approach.

The NRC adoption of State analysis without solicitation and consideration of public comments would also violate NEPA and the CEQ regulations. Public participation in previous State proceedings would not satisfy NEPA's comment requirements because such participation would be limited to persons receiving notice of and having a right to participate in the State action, and would provide no opportunity for comment on the NRC's independent evaluation.

The NRC could, of course, consider a State's analysis in preparing the draft SEIS and, to the extent that the NRC deemed appropriate, include that analysis in the draft SEIS. In essence, the NRC would simply be consulting with the State in preparing its required NEPA analysis. However, this approach would not alleviate the States' concern. In fact, it would compound the problem because the NRC would be required under NEPA to independently review the State's analysis, and might explicitly reject the State's findings.

If the NRC accepted a State's analysis as the starting point of the evaluation of need for power and alternatives, it would be obligated to receive and respond to public comments on the analysis, to consult with other Federal agencies and consider their views, to perform an independent review of the analysis, and if the analysis is challenged in the license renewal hearing, to adjudicate the validity of the analysis. The difficulties posed by Option 2 are compounded by the fact that, for some plants, more than one State may be involved in the ratemaking and other regulatory processes related to electric power generation. Therefore, this option is potentially the most intrusive into State decision making and is the most likely to interfere with State determination.

Option 2 also raises other serious concerns. If the NRC adopts a procedure that requires or allows a State analysis of need for power and alternative energy sources as part of the NRC's NEPA review, there is a risk that license renewal proceedings could be significantly delayed until the State analysis was developed. It is even conceivable that State inaction could amount to a de facto veto of a license renewal application. This would prevent the NRC's fulfillment of its statutory obligations under the AEA. Having a State review the economics of license renewal before technical requirements are determined would put the cart before the horse. It makes far more sense for the NRC to proceed with its decision on license renewal before State proceedings are conducted so that any necessary capital additions and increases in operation and maintenance (O&M) costs can first be determined.

Comment: S020.005 **Page:** Enc 10
Commenter: R. W. Bishop **Org:** Nuclear Energy Institute (formerly NUMARC)

The NEI believes that Option 3 would accomplish very little, if anything. While the NRC would assume that existing capacity is needed, an evaluation of alternatives would still be required, and the States' concern over conflicting NRC findings on these issues would not be resolved.

Comment: S020.006
Commenter: R. W. Bishop

Page: 10–11
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented that Option 4 would avoid NEPA's public comment and independent review requirements by treating need for power and alternative energy sources as matters to be disclosed, but not considered substantively. This option, if implemented as discussed at the workshop, would not be lawful. NEPA is not merely a disclosure statute. It requires a Federal agency not only to publicly disclose the environmental impacts of and alternatives to a proposed Federal action, but also to take a "hard look" at and consider such matters to the fullest extent possible in its decision making process. A procedure that provides information pertinent enough to disclose and then fails to "fully consider" that information in the decision making does not satisfy NEPA's "hard look" requirement.

This option also raises the problem of timing similar to that associated with Option 2. If the NRC intends to disclose the States' analyses, individual license renewal proceedings could be significantly delayed while State proceedings are ongoing, or, potentially, result in a de facto veto of the license renewal application. Further, without the NRC first having determined the technical requirements for continued operation, the State analyses would necessarily suffer from uncertainties in the assumptions concerning any capital additions required for and O&M cost increases associated with license renewal.

Comment: S020.007
Commenter: R. W. Bishop

Page: 2–3; Enc 11–14
Org: Nuclear Energy Institute (formerly NUMARC)

With regard to the modifications to Part 51 which the NRC has negotiated with the CEQ and the EPA, the NEI continues to believe that the NRC can and should generically resolve environmental issues related to operating license renewal. Significant benefits attained through the use of a generic rulemaking are that it conserves NRC's, licensees', and the public's resources by avoiding duplicative reviews of factual issues that are common to all plants, and it ensures a more timely, predictable, and stable process. The NEI is particularly concerned about three aspects of the negotiated changes.

1. Use of an EA in individual license renewal proceedings.

   The NEI believes that the elimination of the option to prepare an EA does not serve the public interest. The current proposal to prepare an SEIS in all cases appears to prejudge the impacts of license renewal without any supporting factual basis. The tentative conclusions of the GEIS indicated that the impacts of license renewal appear insignificant and no information in the regulatory record indicates otherwise. The decision to prepare an SEIS in all cases, therefore, appears to be arbitrary and capricious. This is particularly evident for applications seeking license renewal for short periods.

   It will be extremely costly and an inefficient use of public resources to prepare an SEIS in those cases where it is readily obvious from the evaluation in an EA that no significant impacts will result from the requested license renewal. The NRC still is required to identify, *inter alia*, the bases for the FONSI determination where one is made.

The NEI believes that the issuance of an individual plant-specific EA in draft form is a reasonable response to the CEQ's and the EPA's concern, and urges the NRC to retain the use of an EA, which would be circulated for public comment in individual proceedings.

2. Standard for review of Category 1 and bounded Category 2 issues.

Under the revised approach, the NRC apparently will consider all comments on all analyses regardless of category. For Category 1 and bounded Category 2 analyses, however, the NRC has already agreed to "reopen" its consideration of the relevant issues if "new and significant" information is provided by a commenter. It is very important for the NRC to adhere to the standard set out for the waiver of an NRC regulation (see 10 CFR 2.758). To permit a lesser standard is to dilute the value of the generic analyses and potentially incur duplicative reviews and unnecessary delay through the consideration and, possibly, litigation of issues which previously have been determined.

3. Ensuring an expeditious review process where "new and significant" information has been submitted.

Under the NRC's CEQ/EPA negotiated approach, NRC staff would be permitted, with regard to new and significant information adjudged potentially to have industry-wide application, to seek approval of the NRC through some unspecified process to suspend the rule's application with respect to that analysis, to delay the individual proceeding at issue, or to hold all pending applications until the rule can be amended. The NRC should simply suspend the application of the rule with respect to the generic analysis applicable to that issue. Individual application proceedings should be allowed to continue and the environmental concern to which the new and significant information is addressed would be required to be handled on a case-by-case basis without reference to the generic analysis. To do otherwise would be to place the licensee in the untenable position of being prohibited from proceeding even if it is capable of addressing the issue or modifying its actions without reliance on the generic analyses. Thus, the NEI believes that the NRC should revise its agreement with the CEQ and the EPA to specify that, in the above described circumstances, a licensee may proceed without reference to the generic analysis at issue and need not await the outcome of the revised rulemaking.

B-5. Summary of Written Comments on the Proposed Supplement to the Proposed Rule (59 FR 37724)

Comment: SPR01.001
Commenter: M. I. Lewis

Page: 1
Org: Individual

Commenter stated that, through its supplemental proposed rulemaking, the NRC is once again reviving the notion of "incentive regulation" put forth in NUREG/CR-5509, which attempts to eliminate the barriers to unbridled nuclear expansion. Category 1 assumes generically that there is a need for the electricity from the nuclear plant petitioning for renewal of its operating license. This is neither a right assumption, nor the province of the NRC. [Determination of need] is the regulatory function of the free market or the State regulator.

Comment: SPR02.001
Commenter: S. L. Hiatt

Page: 1
Org: Ohio Citizens for Responsible Energy

The Ohio Citizens for Responsible Energy supports the NRC's recommended approach as set forth in the supplemental proposed rule, published in 59 FR 37724, and fully agrees with the NRC's reasoning for not recommending the States' approach.

Comment: SPR03.001
Commenter: H. Wodtke

Page: 1
Org: Individual

Commenter indicated that the government or any of its agencies or representatives shall not abridge the rights of citizens to present comments and testimony on any subject that affects their lives and safety, and that of their descendants. He asks the following questions:

"1. If all aspects of the generation of nuclear power is so safe, why has the U.S. Department of Energy not built their offices atop a low-level radioactive waste disposal facility?

2. Why is it a published fact that the nuclear-industry complex has determined that 10,000 deaths per year, as a result of actions of the nuclear industry complex, is acceptable?"

Comment: SPR04.001
Commenter: D. Sampsel

Page: 1; 3–7
Org: State of Minnesota

The State of Minnesota commented that it has concluded that there is need for additional modification of the supplemental proposed rule before Minnesota's concerns can be alleviated. Minnesota believes that the proposal may still intrude impermissibly into areas of State authority and violate NEPA (see Minnesota's 1992 and 1994 comments). The NRC should consider withdrawing the proposed rule and GEIS so that decisions regarding relicensure are made on a plant-specific basis. If the NRC chooses to proceed with this rulemaking, the final rule must be modified to address the concerns noted below:

A. **An explicit statement is required in the rule text and in each individual licensing decision that the rule in no way preempts State jurisdiction over the determination of**

continued need for generating capacity and alternatives, and that the NRC's findings are intended only to assist the NRC in meeting its NEPA obligations. While the explanatory language accompanying the supplemental proposed rule suggests that the NRC is acknowledging the State's authority over any decisions regarding need, costs, or alternatives, more explicit clarification is needed, setting forth the State's role and the NRC's role in relicensing decisions as has been repeatedly requested by the States and others since 1985. Three statements in the commentary contained in the notice of the supplemental proposed rule should be incorporated into the text of the rule and GEIS:

1. The proposed definition is intended to convey that, absent findings in the Atomic Energy Act (AEA) safety review or in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC will not interfere with the energy planning decisions of State regulators and utility officials.

2. A renewed license is not a mandate or a commitment to operate, but is simply documentation that the licensee can meet the NRC's public health and safety requirements.

3. The GEIS would contain no discussion of the need for power, the economic competitiveness of nuclear power, or other economic considerations related to these issues.

If the above statements are incorporated as suggested, they will address a substantial portion of Minnesota's jurisdictional concerns.

B. **Previously identified technical inadequacies must be addressed, including the reclassification of certain issues to Category 3 from Categories 1 and 2.** It is unclear what changes in issue inclusion, definition, or category designation will occur as a result of the July 1994 supplemental proposed rule, and thus, it is not possible to comment completely as to whether the supplement is responsive to State objections.

C. **All NRC project-specific environmental impact statements (EISs) and relicensing decisions should defer to State determinations on issues of need for generating capacity and alternative energy sources to the maximum degree possible pursuant to NEPA.** As part of this rulemaking, to the extent that the environmental review looks at need and alternatives, the NRC must implement an environmental review process whereby the NRC considers and gives substantial weight to the record developed in State integrated resource plans (including the underlying data and analysis) because to fulfill its public disclosure obligation under NEPA, NRC decisions on individual relicensing applications must be made on the most recent and complete information available. To the extent that need and alternatives are included in the GEIS as Category 1 items, the required reconciliation of inconsistencies between the NRC and State determinations will be impossible. Information from States' environmental reviews under "little NEPAs" and States' existing environmental policies and standards should also be included in the NRC environmental reviews. The Energy Policy Act of 1992 and its subsequent implementation, with the oversight and assistance of the DOE, should substantially alleviate NRC staff concerns expressed on page 37725 of the proposed supplemental rule.

D. **Adequate State and public participation is required to achieve full disclosure under NEPA.** Although Minnesota expressed grave concerns in this area in testimony and written filings, the supplemental proposal remains silent on this issue. Minnesota remains concerned that the proposed rule may still obstruct public participation, and highlights the following points from its March 1994 filing: (1) changes proposed in response to CEQ's and EPA's comments do not in themselves significantly allow discussion of issues at the time a license renewal application is filed; and (2) once generic determinations are made, those issues cannot be reopened without overcoming difficult and cumbersome rulemaking procedures, or demonstrating new and significant information. This impermissibly shifts the burden of environmental disclosure to the States and to the public.

As previously indicated in Minnesota's March 4, 1994 comments, all of the above proposed modifications are required to address their concerns.

Comment: SPR05.001
Commenter: A. G. Berwick

Page: 1–2
Org: Environmental Protection Division, Office of Attorney General, MA

The Massachusetts Environmental Protection Division commented that while it applauds the NRC's view that fundamental issues of State energy policy, such as the need for power, should be left to State decision makers, the NRC must also address the need for a plant's power in order for the NRC to fulfill its obligations under NEPA. The Environmental Protection Division supports Option 2 in the NRC's discussion paper, as amended by the Environmental Protection Division's letter of March 3, 1994, so that the environmental analysis done at the time of relicensure does not preclude, control, or preempt a State's analysis performed closer to the time of the current license's expiration. Meaningful analysis of complex issues like need and alternatives is impossible in the context both of generic resolution of relicensure issues and plant-specific resolution of issues a decade or more before the expiration of the first license.

Comment: SPR05.002
Commenter: A. G. Berwick

Page: 3
Org: Environmental Protection Division, Office of Attorney General, MA

The Massachusetts Environmental Protection Division remains troubled by the NRC's generic treatment of the alternatives issue and is unpersuaded that alternatives are appropriate for generic analysis. This issue clearly calls for specific analyses of available alternative energy sources in the particular region involved at the time of the individual plant's relicensure. Analogous to the examination of the need for a facility's power, this analysis should also explicitly avoid preclusion of a State's differing analysis at a point in the future that is much closer to the time of the current license's expiration. As energy technology rapidly changes—particularly in ways that are sensitive to regional variations in the availability of renewable energy resources—States should be free to evaluate fully the alternatives to nuclear power and the environmental consequences of such alternatives.

Comment: SPR06.001
Commenter: C. D. Gray

Page: 1
Org: National Association of Regulatory Utility Commissioners

The National Association of Regulatory Utility Commissioners (NARUC) commented that the NRC's environmental review for renewal of operating licenses should not interfere with State resource planning processes or other State regulatory actions concerning whether individual plants should continue to operate after their initial license term. In that regard, questions concerning the need for relicensing of an individual plant are fundamental elements of the economic regulation of electric utilities that are properly within the purview of State regulatory commissions. As the State parties have made clear in this proceeding, State regulatory and resource planning agencies expect to address and resolve so-called "need and alternatives" issues involved in plant relicensing in light of prevailing conditions in individual utility service areas. The NARUC believes that the NRC should be solicitous of the central role of the States as the electric services industry responds to the competitive forces triggered by the restructured transmission system and bulk power marketplace. Accordingly, the NARUC suggests that the NRC reconsider its decision to reject the approach proposed by New York. New York's approach, perhaps with some modifications to address NRC staff's concerns, can meet the NRC's regulatory obligations, while respecting the regulatory role of the States.

Comment: SPR07.001
Commenter: D. N. Morey

Page: 1
Org: Southern Nuclear Operating Company

Southern Nuclear Operating Company is in total agreement with the Nuclear Energy Institute's (NEI's) comments provided to the NRC in response to the supplemental proposed rule.

Comment: SPR08.001
Commenter: J. P. O'Hanlon

Page: 1
Org: Virginia Power

Virginia Power believes that the approach recommended by NRC staff represents a practical compromise and addresses the States' concerns without compromising the NRC's responsibility to implement NEPA. Virginia Power also endorses the NEI position and comments provided separately.

Comment: SPR08.002
Commenter: J. P. O'Hanlon

Page: 1–2
Org: Virginia Power

Virginia Power requests that NRC staff reconsider their decision to (1) require an EIS and not allow an environmental assessment (EA) and a finding of no significant impact; and (2) address all environmental issues, regardless of their generic resolution in the GEIS, as part of the site-specific environmental review. Virginia Power believes that the NRC already has the flexibility it needs to allow for extensive public participation without requiring a supplemental EIS (SEIS) for all license renewal applications. To require an EIS for all license renewal applications does not seem to be justified; there will be no tangible benefit and considerable unwarranted expense.

Comment: SPR09.001
Commenter: E. J. Gleason

Page: 1
Org: New York State Energy Office

The New York State Energy Office (NYSEO) commented that the supplemental proposed rulemaking as described in the *Federal Register* notice (59 FR 37724) explanatory text substantially addresses the concerns raised in NYSEO's comments submitted on March 12, 1992 and March 3, 1994. The NRC's redefinition of purpose and need for the proposed action (i.e., whether license renewal is needed to preserve continued nuclear operation as a reasonable resource option for a State's consideration) realistically reflects the traditional NRC, State, and utility roles in resource decision making. The NYSEO urges the NRC to incorporate recognition of these roles explicitly in the text of the rule.

Comment: SPR09.002
Commenter: E. J. Gleason

Page: 1
Org: New York State Energy Office

The NYSEO commented that it is important that an NRC finding of need, as redefined in the supplemental rule, be considered as a Category 3 issue because continued operation is a unit-specific issue. A site-specific examination will allow for State participation in order that the most thorough and timely information regarding a site or unit can be considered.

Comment: SPR10.001
Commenter: R. W. Bishop

Page: A2
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented that the NRC's supplemental proposed rule is lawful and should resolve the States' concerns. The supplemental proposed rule recognizes the primacy of State regulatory decisions regarding future energy options, and that the choice of energy options also will be made by utility decisions. It also correctly characterizes the NRC license renewal process as one which preserves (1) the option for operating nuclear plants beyond their original license term, and (2) the advantages of generic decision making on environmental issues.

Comment: SPR10.002
Commenter: R. W. Bishop

Page: A2–A5
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI suggests that the NRC give further thought to its proposed analysis of the no action alternative.

It believes that the NRC's consideration of the environmental impacts of other sources of energy in the context of the no action alternative assumes that replacement power will be needed and that, therefore, the environmental impacts of the possible ways by which that power could be supplied must be evaluated. This is unnecessary because the purpose of the major Federal action here is not a general one of supplying power to the region in which the plant at issue is located. Alternative forms of generating capacity that could supply such power are not reasonably related to preserving the option of continued operation of the specific unit(s) at issue.

While the NRC's proposed supplement has reduced the likelihood of any perceived usurpation of State authority to choose generating capacity, its treatment of the no action alternative perpetuates the possibility of such conflict. The NRC's approach to alternative energy sources could foreclose a State from choosing the nuclear option on grounds other than those associated with its mandate under the AEA with respect to public health and safety, where Congress and the Supreme Court have clearly indicated there is no Federal preemption. The proposed supplement would allow the NRC to make findings that could be viewed as precluding subsequent State deliberations to which States are legally entitled.

This analysis of the no action alternative can be avoided by recognizing that there will always be an implicit value in preserving the option of license renewal. First, there is value in preserving the ability of State regulators and utilities to make future decisions about generating capacity. This value is not purely economic; instead, it is an interest on the part of both government and the public in integrated resource planning. Second, the continued safe and efficient operation of an existing nuclear plant beyond its initial license expiration date can reasonably be expected to produce net economic or environmental benefits. Because the possibility of these benefits cannot be discounted, preserving the option of continued operation also has a positive economic and environmental value. Thus, as long as it is recognized that there is a possibility that continued operation might produce net benefits, one must also recognize that there is a related positive value to preserving that option.

If this implicit value is recognized, there is no need for analyses of other generating technologies or for speculation about impacts that might occur decades in the future. This value is legally sufficient to allow the NRC to reject the no action alternative.

The NEI recommends that the NRC's analysis of the no action alternative simply consist of recognition that the no action alternative (i.e., rejection of license renewal) as it applies to need for power and alternate energy source considerations eliminates a valuable option and interferes with subsequent State and utility resource planning.

Comment: SPR10.003
Commenter: R. W. Bishop

Page: A5
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented in response to an NRC question expressed at the May 16, 1994 public meeting of whether the approach recommended by NEI might not also obviate any consideration of the effects of extended operation of a nuclear plant seeking license renewal (perhaps suggesting that the NEI's approach might be too limiting). The NEI stated that that is not its intent. The NRC's evaluation of the effects of extended operation for all matters other than need for power and alternative energy sources is appropriate for two reasons. First, the NRC is the best agency to quantify the environmental effects of future nuclear plant operation, and since these effects could eventually flow from the NRC's decision (subject to intervening State decision making), their quantification and disclosure is appropriate under NEPA. However, this does not mean that a need for power and the effects of alternative energy sources must also be quantified, because (under NEI's recommended approach) the NRC would not be basing its decision to preserve the option of extended nuclear plant operation on a cost-benefit balance of alternative energy sources. Second, evaluation of the effects of extended operation is relevant to decisions involving any

necessary changes to the plant's design or current licensing basis. Thus, under NEI's recommended approach, the evaluation in the GEIS of all matters other than need for power and alternative energy sources would continue to be a meaningful review, disclosing to the public the effects of extended operation if State and utility resource planning results in selection of the nuclear option.

Comment: SPR10.004
Commenter: R. W. Bishop

Page: A5
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented that even though it agrees with the NRC's choice to propose implementing the supplement, the NRC should explain, in the Supplementary Information accompanying the final rule, why other options initially proposed by the NRC to address the States' concerns were not selected. The July 25, 1994 *Federal Register* notice adequately explains why a modified version of Option 2 was rejected in favor of the recommended approach, but does not address the other three options.

Comment: SPR10.005
Commenter: R. W. Bishop

Page: A6
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented that the NRC should clarify the procedure to be used if a party seeks to challenge the determinations in the GEIS or their applicability to a particular plant. The July 25, 1994 *Federal Register* notice states that if, in an individual license renewal proceeding, new and significant information "created a doubt" concerning previous conclusions in the GEIS, the NRC would consider that information to determine if the previous determinations in the GEIS were no longer valid for that particular plant (59 FR 37726). If this statement is intended to establish the standard for waiver of alternatives made in the GEIS, it is too vague and inconsistent with established NRC procedures for obtaining a waiver of a rule. No justification is provided for making an exception to those procedures. The NEI does not believe that a logical basis exists for making such an exception for license renewal from those established procedures.

The NEI recommends that the final rule explicitly acknowledge that the procedures and standards set forth in 10 CFR 2.758(b)(1), (c), and (d) apply to the waiver of the Part 51 license renewal regulation. Adopting an alternative standard is likely to create confusion, and the inconsistency might lead to unnecessary judicial challenge.

Comment: SPR10.006
Commenter: R. W. Bishop

Page: A6
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI commented that the final rule should amend any portions of 10 CFR Part 51 that could be interpreted as requiring a cost-benefit balance (see, e.g., 10 CFR 51.71(d) and n.3). As recommended, the GEIS would not include a cost-benefit balance for alternatives, and no such requirement exists under NEPA. Under the CEQ regulations, a cost-benefit balance is optional

(see 40 CFR 1502.23, which states, "If a cost benefit analysis relevant to the choice among alternatives is being considered. . . .").

Comment: SPR10.007
Commenter: R. W. Bishop

Page: A7–8
Org: Nuclear Energy Institute (formerly NUMARC)

The NEI urges that its previous concern over the NRC's apparent decision to eliminate the option of issuing an EA in connection with license renewal applications be addressed. The NEI believes that the elimination of the option to prepare an EA is not justified and does not serve the public interest for several reasons.

First, the current proposal to prepare an SEIS in all cases appears to prejudge the impacts of license renewal without any supporting factual basis for that conclusion.

Second, eliminating the option to issue an EA is far more sweeping than is necessary to address the EPA and CEQ concern that an EA might not afford the public sufficient opportunity to comment. The NRC can address the concern simply by circulating a draft EA for public comment, as is already permitted by the NRC's rules.

Finally, it will be a costly and inefficient use of public resources to prepare an SEIS in those cases where it is obvious from the evaluation in an EA that no significant impacts will result for the license renewal.

Comment: SPR11.001
Commenter: R. E. Sanderson

Page: 1
Org: U.S. Environmental Protection Agency

The EPA agrees with the CEQ's conclusions (see SPR19 comments) that the NRC's proposed approach is inappropriate in the light of the approach suggested by the State of New York.

Comment: SPR11.002
Commenter: R. E. Sanderson

Page: 1
Org: U.S. Environmental Protection Agency

The EPA endorses the State of New York's approach as it provides a broader definition of purpose and need that will allow for a wider range of alternatives to be included in the NEPA document than does the NRC's preferred option. The EPA believes that New York's approach would both comply with NEPA and satisfy the States' concerns (see S006.005).

Comment: SPR12.001
Commenter: Gordon et al.

Page: 1–2
Org: Massachusetts Department of Public Utilities

The Massachusetts Department of Public Utilities (MDPU) believes that it is critical that State public utility commissions retain the clear authority to address need and alternatives through cost-

effectiveness evaluations. Hence, they support the NRC's "Recommended Approach" as contained in the supplemental proposed rulemaking. The MDPU Commissioners further believe this recommended approach contains a number of important features and would accomplish the following:

1. Redefine the purpose of and need for NRC action on a request for renewal of a nuclear power plant operating license to indicate that any resultant approval would preserve the continued operation of a nuclear power plant as a safe option that State regulators and utility management may consider in their energy planning decisions.

2. Require the NRC to consider the environmental impacts of a range of alternatives to license renewal so as to identify and evaluate any resources that may reasonably serve the stated purpose and need.

3. Require the NRC to consider the environmental consequences of rejecting an application for license renewal, i.e., the NRC would be required to consider the environmental impacts of the energy resources that might reasonably be expected to replace a nuclear power plant whose operating license is not renewed.

4. Change the NRC's NEPA decision standard: approval of a request for license renewal would not depend on an NRC finding that continued operation of a given nuclear power plant would be the preferred option.

[Note: Closely parallels NEI comments—see SPR10.)

Comment: SPR13.001 **Page:** 1–3
Commenter: S. Franks **Org:** U.S. Department of Energy

The DOE generally agrees with the approach recommended in the supplemental proposed rulemaking, but recommends the following clarifications when the NRC issues the final rule:

1. The NRC should explain its treatment of the options considered for resolving the States' concerns, i.e., why the options were rejected.

2. The final rule should specify the procedure to be used in the event that an intervenor seeks to challenge the applicability of determinations in the GEIS to a specific plant. The procedures currently set forth in 10 CFR 2.758(b)(1), (c) and (d) would be applied.

3. The final rule should specifically amend those aspects of 10 CFR Part 51 which could be interpreted as requiring a cost-benefit balance (see, e.g., 10 CFR 51.71(d) and footnote 3). As recommended, the GEIS would not include a traditional cost-benefit balance for alternatives. No such requirement exists under NEPA (see 40 CFR 1502.23—"if a cost-benefit analysis relevant to the choice among alternatives is being considered. . . .").

With adoption of the clarifications discussed above, the DOE believes that the NRC's approach not only resolves the States' concerns, but also significantly improves the environmental review for license renewal.

Comment: SPR13.002 **Page:** 3–4
Commenter: S. Franks **Org:** U.S. Department of Energy

The DOE does not endorse other changes such as the agreements outlined in the January 1994 NRC Staff Discussion Paper addressing the EPA and the CEQ comments (59 FR 2542). In particular, the DOE is concerned with the NRC's proposed change to prepare a SEIS rather than an EA for every license renewal application. The DOE suggests that a draft EA be published for public comment to afford the public sufficient opportunity to participate in the proceeding. The DOE believes that this change to the original proposed rule would address the CEQ and the EPA concerns as well as be consistent with the NRC's primary objective for the rulemaking, which was to improve the efficiency of the environmental review process required for license renewals.

Comment: SPR13.003 **Page:** 4
Commenter: S. Franks **Org:** U.S. Department of Energy

The DOE urges the NRC not to recategorize the findings in the GEIS unnecessarily. The DOE believes that the original "Category 1" findings were factually supported, and the NRC procedure for waiving a rule (10 CFR 2.758) provided a sufficient mechanism to allow consideration of such issues in individual cases where special circumstances made particular generic findings inapplicable. The DOE is concerned that if, in response to comments, the NRC decides to redesignate too many of the findings as "Category 3" (subject to reevaluation, challenge, and litigation without any threshold), the decision effect and benefit of the GEIS might be lost.

Comment: SPR14.001 **Page:** 3–4
Commenter: J. M. Grant **Org:** Yankee Atomic Electric Company

The Yankee Atomic Electric Company (YAEC) expressed concern about the NRC's analysis of the no action alternative. Here, the NRC proposes to evaluate on a generic basis the environmental impacts of several sources of electric power generation. If the environmental impacts of nuclear power fall within the same range as the impacts of other sources, the NRC would consider itself justified in rejecting the no action alternative.

In YAEC's view, the generic evaluation of energy generation impacts from various sources in the manner discussed above would unnecessarily destabilize the license renewal process. Given the constantly changing technology of electric power generation capability, the environmental impacts of various generation sources are likely to change over the short term, and thereby, more readily subject generic determinations on such matters to challenge in individual license renewal cases. Successful challenges would result in a reexamination of the GEIS determination to "preserve the option" in individual license renewal cases. A valid and persuasive basis exists to properly reject the no action alternative, one that does not involve the weighing of competing environmental impacts.

The no action alternative can be rejected generically on the basis of the "preserving the option" rationale. The strength of this rationale serves not only to shape the nature of the Federal action for license renewal (as recognized by the NRC), but also to justify rejection of the no action alternative. As recognized by the Congress and the States, a pressing need exists to create a comprehensive and coordinated State/Federal regime of electric utility system planning and regulation for the nation's future energy needs. This is a powerful and persuasive basis for favoring the renewal of nuclear power plant licenses over the no action alternative.

Comment: SPR14.002 **Page:** 4–5
Commenter: J. M. Grant **Org:** Yankee Atomic Electric Company

The YAEC opposes the NRC's decision to prepare an SEIS instead of an EA. The NRC's proposed decision to dispense with cost-benefit balancing in the NEPA evaluations for renewed licenses provides a further reason to use EAs in lieu of SEISs. During the public meeting on March 16, 1994, the Office of General Council indicated a concern that a GEIS could not logically be linked with an EA; rather the GEIS for license renewal seemed to go hand-in-hand with an SEIS (meeting transcript, p. 102, lines 14–18). The force of this argument, however, loses any persuasive value now that the GEIS and the site-specific NEPA document will no longer (assuming the revised purpose of the NRC's proposed action is finalized) strike a cost-benefit balance. It seems entirely logical to identify and assess generic impacts in a GEIS and to identify and assess local impacts in an EA. Concerns about public participation can be accommodated by providing for public comment on the EA.

Comment: SPR15.001 **Page:** 1
Commenter: R. E. Denton **Org:** Baltimore Gas and Electric Company

The Baltimore Gas and Electric Company agrees with the NRC that its approach, as presented in the supplemental proposed rulemaking, has merit and is a workable alternative. It also endorses the comments submitted by the NEI, which recommends a number of changes to the proposal.

Comment: SPR16.001 **Page:** 2–3; 5–6
Commenter: D. J. Buckley **Org:** Pennsylvania Public Utility Commission

The Pennsylvania Public Utility Commission (PAPUC) commented that the supplemental proposed rule and GEIS submitted by the NRC is a welcome step by the NRC in recognizing the primacy of the States in energy planning. While the tone of the staff discussion, and some of the statements contained therein, go far to resolve the differences between the States and the NRC, the proposed rule and GEIS might still be construed in such a way as to intrude upon State regulatory authority. A number of clarifications and specific statements are needed in the final rule and GEIS to prevent this intrusion or misinterpretation of the NRC's intent.

The PAPUC requests that the NRC's definition of "purpose and need" be expanded as follows:

> The purpose and need of the proposed action is to preserve the option of continued operation of nuclear power plant[s] for State regulators and utility officials in their future

energy planning decisions. This definition is not an endorsement by the NRC of nuclear power as a preferred energy source. Absent findings in the AEA safety review or in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC will not interfere with the energy planning decisions of State regulators and utility officials. A renewed license is not a mandate nor a commitment to operate but is simply documentation that the licensee can meet the NRC's public health and safety requirements. The GEIS will contain no discussion of the need for power, economic competitiveness of nuclear power, or other economic considerations related to future energy planning decisions.

(See other comments as well from PAPUC for more recommended clarifications.)

Comment: SPR16.002
Commenter: D. J. Buckley

Page: 3–4; 6–8
Org: Pennsylvania Public Utility Commission

The PAPUC concurs with NRC staff that there are only two alternatives which may result from their recommended approach: renewal of an operating license or nonrenewal. Under this scheme, the NRC will examine in the GEIS the full range of environmental impacts of other sources of energy because it maintains that there will be environmental impacts attendant to nonrenewal since, presumably, the nuclear plant's generation will have to be replaced by some other source of energy. The PAPUC is troubled by this because it appears that, in effect, the NRC may pass final judgment upon the relative economic and social desirability of all sources of electric generation. Again, and as set forth in its original comments, the PAPUC questions whether such a GEIS will not stray into economic analysis, intrude upon State jurisdiction and, potentially, be interpreted as a "back-handed" endorsement of nuclear power. It may appear to some from NRC staff discussion in the supplemental rule that the NRC is attempting to preserve economic analysis under the guise of "environmental externalities." To avoid this, PAPUC requests that the final rule specifically state the following:

> Under both the renewal and nonrenewal ("No action") alternatives, the NRC will not make a finding in the GEIS that existing nuclear power plants are the preferred source of energy. The Commission recognizes the primacy and expertise of the States in the area of energy planning and in assessing the environmental impact of other sources of energy. The Commission will not make a determination on economic issues, whether explicitly raised as such or presented under the guise of "environmental externalities."
>
> Further, in each individual relicensing action, if new information creates a doubt concerning previous conclusions in the GEIS and its [sic] applicability to a specific plant, the NRC will consider that information to determine whether previous determinations in the GEIS are valid for that particular plant.

Comment: SPR16.003
Commenter: D. J. Buckley

Page: 4; 8–9
Org: Pennsylvania Public Utility Commission

The PAPUC recommends that the replacement of the "obviously superior" standard with a "reasonable range of alternatives" approach in the supplemental proposed rule be dropped.

The PAPUC does not see a great deal of difference in the end result of the application of either standard. If a nuclear plant is not to be relicensed, then any EA of energy generation alternatives is properly reserved to the States. The NRC's approach appears to be a "back-handed" attempt to have the NRC pass on the desirability of energy generation alternatives.

While a certain level of comparison among energy sources may be necessary to understand the relative environmental impact of a nuclear plant, the NRC must be clear that the primary goal of the GEIS will be focused on the environmental impact of a nuclear plant granted relicensure. The mere fact that the NRC presents its relicensure decision as falling within the "reasonable range" of alternatives cannot and must not become a mandate to the States for the inclusion of nuclear power in energy planning.

Comment: SPR17.001
Commenter: R. F. Phares

Page: 1
Org: Illinois Power

Illinois Power concurs with the revised definition and the supplemental proposed rulemaking. It believes this will leave the economic issues associated with the need for generating capacity to the States and utilities, permit the NRC to focus on environmental issues regarding license renewal, and simplify the license renewal process.

Comment: SPR18.001
Commenter: R. P. Sedano

Page: 1
Org: Vermont Department of Public Service

The Vermont Department of Public Service (VDPS) finds the supplemental proposed rulemaking unclear, ambiguous, and perhaps redundant. It urges adoption of the State approach.

Comment: SPR18.002
Commenter: R. P. Sedano

Page: 2
Org: Vermont Department of Public Service

The VDPS commented that the NRC's recognition of State jurisdictional authority must be translated into a clear statement of this in the rule itself. The following statements in the proposed rule must become a part of the final rule rather than simply notes of consideration.

1. The purpose of license renewal is to preserve the nuclear option so "that State regulators and utility officials may consider [the option] in their future energy planning decisions" (59 FR 37725, Col. 2).

2. "The NRC will not interfere with the energy planning decisions of State regulators and utility officials" (59 FR 37725, Col. 3).

3. The redefined purpose and environmental standard would allow the NRC to perform its NEPA review and also "demonstrate an appreciation of the primacy and expertise of the States in the area of energy planning" (59 FR 37726, Col. 1).

Comment: SPR18.003 **Page:** 2–3
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the proposed redefinition of the purpose of license renewal attempts to obfuscate the clear national environmental policy enacted by NEPA, which is to evaluate major Federal actions such that environmentally preferable alternatives are chosen. As stated in VDPS's comments of March 16, 1992, this basically involves an evaluation of (1) nuclear waste from continued operation of nuclear plants compared with air emissions from petroleum sources, (2) the viability of newer technologies with lower environmental impact and higher costs, and (3) the purchase of foreign energy. The VDPS believes this environmental evaluation must be made. The original proposed rule, although flawed, intended to create a process to accomplish this evaluation. Under the proposed redefinition, it is unclear when or whether this evaluation would be made.

Comment: SPR18.004 **Page:** 3
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the proposed redefinition of the purpose of license renewal is inconsistent with 10 CFR Part 54 (license renewal) rule, which evaluates the safety of continued operation for a specific time period, and carries the presumption that the plant will operate for that period. A site-specific application will contain a request for a renewed operating license for a specific period of time. Therefore, the NEPA review must balance the environmental impacts of operation over this period of time with the environmental impacts of other alternatives. The real major Federal action is allowing the operation, not granting the option.

Comment: SPR18.005 **Page:** 3
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the environmental preferability review must be clearly identified and consistent with national environmental policy. The State approach (59 FR 37725, Col. 1) establishes a method of accomplishing the environmental review while upholding the interests of the States. The meaning and effect of the supplemental proposal is unclear. Either the proposal intends to avoid the environmental preferability review, to which the VDPS strongly objects, or the proposal intends that States perform the review, in which case the following statement must to be added to the rule:

> "States shall be responsible for determinations of issues of need for continued operation of nuclear plants, substitution of alternative energy sources, and environmental preferability determinations of energy sources."

Comment: SPR18.006 **Page:** 4
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the proposed redefinition of the environmental standard is unclear and empty of substance such that the proposed review has no meaning and only results in unnecessary

work. This standard (59 FR 37726, Col. 1) appears designed almost to ensure the renewal of licenses. Yet, renewal with the present environmental preferability standard is far from ensured. What constitutes a "reasonable range"? Would license renewal ever be in the "unreasonable range"? The VDPS believes this proposal is unnecessary since the environmental preferability review must be performed somewhere in the process, and it is this environmental preferability review which matters for license renewal.

Comment: SPR18.007 **Page:** 4–5
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that it is unclear whether the NRC intends to retain the Category system described in the GEIS. It is similarly unclear whether the NRC intends to retain the Category 1 designation for alternative energy sources. The original proposed rule excludes Category 1 items for consideration in the site-specific application. It is unclear whether this is still the NRC's intent since no statement to the contrary is included in this supplemental proposed rule. The environmental aspects of alternative energy sources must be designated Category 3.

Comment: SPR18.008 **Page:** 5
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the meaning and effect of the site-specific application is unclear. If the redefined purpose of generic license renewal is to preserve the option of operation, what is the meaning of the site-specific application? What is the form of the request to actually operate, and how does this fit into existing regulations?

The VDPS also questioned the effect of the category scheme used in the GEIS. Does the NRC intend that all Category 1 designations not be considered in the site-specific "preserving the option" review, but all Category 1 designations be considered in the "environmental preferability" review by the States? If the category scheme is retained, the VDPS believes the following statement is necessary in the text of the proposed rule:

> "The characterizations and categorizations of environmental impacts in the GEIS shall not be determinative and dispositive for State evaluations of [the] environmental preferability of alternative energy sources."

Comment: SPR18.009 **Page:** 5–6
Commenter: R. P. Sedano **Org:** Vermont Department of Public Service

The VDPS commented that the discussion of the State approach in the supplemental proposed rule is deficient because it does not indicate that the GEIS must be revised to address the numerous technical inadequacies identified in State comments. The VDPS made numerous additional comments and requests for Category redesignations on March 16, 1992, which have not been addressed. The VDPS believes that not addressing these technical inadequacies would be an abridgement of the public participation intended by NEPA.

Comment: SPR18.010
Commenter: R. P. Sedano

Page: 6
Org: Vermont Department of Public Service

The VDPS commented that, regarding guidelines for working with the States, the NRC has a successful history of working with State planning processes in the construction-permit stage of nuclear plants. In those cases, applicants' environmental reports reflected State planning processes for need and alternatives. The NRC EISs used State information from these reports, and also verified the information through the resolution of State comments. The VDPS recommends that similar cooperation with State planning processes be used for license renewal. Guidelines, if required at all, (1) would not be burdensome, (2) would not be different from typical agreements and guidelines produced regularly by the NRC, and (3) would not be nearly as complicated as the procedures and guidelines that would be required by the supplemental proposed rule.

Regarding the States' ability to make need and alternative determinations, the intent of the State approach is that State determinations should be used to the extent that State processes exist. Therefore, the NRC would not be expected to be burdened by States that may not be equipped for or capable of submitting need and alternative determinations.

Comment: SPR19.001
Commenter: E. Blaug

Page: 1–4
Org: Council on Environmental Quality

The CEQ finds the NRC's approach inappropriate in light of the suggested State approach, which appears to satisfactorily resolve all concerns. The narrow statement of purpose and need, and the restricted alternatives analysis conflict with NEPA's mandate that agencies consider all reasonable alternatives to a proposed action. The underlying need for a proposed action, which defines the range of alternatives in the NEPA review, is an objective description of the reason that a project, and not necessarily the proposed action, is being considered. In determining the scope of alternatives, the emphasis is on what is "reasonable" rather than merely on whether the proponent or applicant likes a particular alternative, or is capable of carrying it out. In fact, the CEQ regulations at 40 CFR 1502.14 describe the alternatives analysis as the "heart" of the environmental impact analysis.

The NRC's recommended approach does not provide for an appropriate scope of alternatives. The NRC should address other energy sources as separate alternatives, rather than as "environmental consequences" to the no action alternative. The requirement for a rigorous alternatives analysis is appropriately met with the recommended State approach, under which the State would develop the alternatives analysis (including alternative energy sources), based on the need for power. This approach is similar to that used by a number of Federal agencies and their State applicants, including the Federal Highway Administration, the Federal Aviation Administration, and the Federal Energy Regulatory Commission (FERC).

The NRC statement that "for the purposes of [the] license renewal GEIS, the proposed approach would replace the obviously superior standard with a standard which requires the environmental impacts of the alternatives considered to be so superior to the impacts of nuclear power as to justify the preclusion of nuclear plant operation . . ." appears to place from the outset an inappropriate bias toward license renewal over any other alternative. While section 1502.14(e) of the CEQ regulations requires agencies to identify a preferred alternative in the draft or final EIS,

this provision contemplates that agencies cannot identify a preferred alternative prior to the draft EIS. The NRC's recommended approach appears to place a weighty and improper "burden of proof" on other alternatives.

Finally, the two cases cited by the NRC for the proposition that its recommended approach "is consistent with the trend of current NEPA case law . . ." do not articulate a trend, particularly in light of the vast body of nearly 25 years of contradictory NEPA interpretations. The CEQ concludes that if the proposed action is the subject of a request for a Federal permit or regulatory approval, the Federal agency should consider both public and private purpose and need. While courts have certainly stressed the need to consider the objectives of the permit applicant, they have also reemphasized the requirement for the agency to exercise independent judgment as to the appropriate articulation of purpose and need.

Allowing States to develop their own needs and alternatives analysis will promote cooperation between the States and the NRC, and will reduce duplication between NEPA, and State and local requirements. The CEQ does not believe that guidelines (for determining acceptability of State analyses) would intrude on a State's planning process because it would be used internally by the NRC to determine whether a particular State's analysis can be incorporated into the NRC's NEPA documentation, or whether the NRC will develop an independent analysis should it determine the State's analysis is inadequate or nonexistent.

The CEQ offered to assist the NRC in developing guidelines for determining the acceptability of State analyses. It also recommends that the NRC consult with agencies such as the FERC, which has developed a *Hydroelectric Project Relicensing Handbook* that delineates how applicants' analyses meet FERC's standards for review and incorporation into NEPA analyses prepared for relicensing actions.

Comment: SPR20.001 **Page:** 1
Commenter: C. K. McCoy **Org:** Georgia Power Company

Georgia Power Company endorses the comments of the NEI (see SPR10 comments).

APPENDIX C

CONCERNS AND NRC STAFF RESPONSES

C-1. Topic: Alternatives to License Renewal (ALT)

Alternatives to License Renewal (ALT)

Concern Nmbr: ALT.001
Topic: Alternatives to License Renewal
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W11.014 W11.042 W11.048 W12.024 031.001 054.019 054.020 054.037 061.005 079.027 079.070 079.072 079.073 079.075 079.101 079.102 079.107 079.108 079.110 087.117 087.117c A113.002 106.002 117.002
Concern: EPA and State agency representatives believe that the alternatives issue must be designated at least Category 2 because of the economic threshold analysis requirement, i.e., the conclusion that license renewal is the best alternative holds only for plants that meet the economic thresholds. Moreover, the EPA stated that because it is difficult to predict what technological advances may be available by the time a licensee applies for license renewal, the evaluation of alternatives must be part of a site-specific document. In support of the need to evaluate alternatives on a site-specific basis, the other commenters cited the following: (1) the comparison of renewable sources must be for specific bounding plants, not to the aggregate capacity for license renewal; (2) justification of need and alternatives cannot be resolved generically for periods far in advance of license renewal; (3) the specific economic structure in certain States (e.g., Vermont) makes the ratepayers still responsible for operating costs even though a plant no longer produces power, and therefore, State involvement at a specific time in the life of the plant is needed; (4) the requirement to limit the comparison of nuclear power production to coal-fired plants is inadequate and fails to provide the necessary balancing analysis between economic and environmental considerations; and (5) to deal with the uncertainties in the analysis, the resource determinations should be delayed until the time of the application when better data and methods for analysis, and more information will be available.

Response: In the final amendments to 10 CFR Part 51, the NRC has eliminated consideration of economics for almost all aspects of its license renewal reviews, and therefore the economic threshold analysis has also been eliminated. Economic costs will be considered only if it is essential for a determination as to the viability of an alternative or if the issue of economic costs is relevant to mitigation.

An analysis of the environmental impacts of alternative energy sources is presented in the revised GEIS, but is not codified in the Part 51 rule. Therefore, at the time of a license renewal application, an applicant will use the GEIS as an aid in preparing a site-specific comparison of the impacts of alternative energy sources with the proposed action (i.e., license renewal). Similarly, the NRC will refer to the GEIS and the alternatives analysis prepared by the applicant in considering alternatives as part of the site-specific supplemental environmental impact statement (SEIS). In addition, the NRC will consider any new information, which has significant bearing on the prior GEIS analysis, provided by members of the public or State agencies during the site-specific comment period. Since the comparison of alternative energy sources with license renewal will not occur until the site-specific application review when new and significant information will be considered, "alternatives" could be considered similar to a Category 2 issue. However, the NRC has eliminated any categorization of the site-specific conclusion regarding "alternatives." The new categorization scheme adopted in the final rule is appropriately limited to the review of environmental issues.

Concern Nmbr: ALT.002
Topic: Alternatives to License Renewal
Subtopic: State's responsibilities
Associated Comment Nmbr(s): W11.051 W11.052 W12.025 W12.030 060.002 079.103
Concern: The Attorneys General of the States of Connecticut, Minnesota, New York, Vermont, and Wisconsin; the State of Vermont; and workshop participants representing the Minnesota Department of Public Service (MDPS), the Public Service Commission of Wisconsin (PSCW), and the Nuclear Management and Resources Council (NUMARC) raised concerns that the NRC's findings on alternatives preempts State jurisdictional responsibilities.

The Attorneys General believe that the determination of alternatives is a State's responsibility "because it involves economic choices both between competing technologies and the assessments of the costs to the environment of nuclear power generation." Thus, they believe that the alternatives issue should be designated as Category 3. The Tellus Institute Study performed for the State of Vermont suggested that if the proposed rule is adopted in its present form, an applicant for license renewal may attempt to use the rule in State proceedings to argue that the NRC findings on need and alternatives preempt State determinations. The NUMARC representative also noted that the States make the decision on which is the right source of power for their jurisdiction. It is not the NRC's responsibility to determine which factors will be considered in the decision, although costs will presumably be included. In this regard, the Minnesota representative suggested that the NRC should put in writing whether the issue (of alternatives) "will or will not affect" how States do their business. If the issue affects the States, then the effect should also be clearly stated.

Response: The GEIS includes a range of alternatives that the NRC has determined are reasonable means of meeting power generation requirements. The information in the GEIS regarding alternatives will be used to facilitate the consideration of alternatives to license renewal during the site-specific review. In response to concerns raised during the comment period, the NRC has changed its approach to the analysis of alternative energy sources in the proposed rule; the NRC will now consider only the environmental impacts of each alternative. The NRC will not include any consideration of economics or of the economic competitiveness of alternative energy sources in determining the acceptability of license renewal as compared to the range of reasonable alternatives. A site-specific SEIS will be prepared to compare the environmental impacts of license renewal with the environmental impacts of the alternatives. The NRC's consideration of alternatives in this context in no way preempts State authority in the areas of utility economics and alternatives. The NRC's decision to grant a renewed license will consider whether the impacts of license renewal, when compared to the alternatives, are sufficiently adverse that it would be reasonable for the NRC to deny license renewal as one of the many power generation options the State and utilities can use in meeting their power generation needs. As such, the NRC will not reach conclusions regarding the economic acceptability of other alternative means of generating power. The NRC has revised the Part 51 rule to include an explicit statement in this regard.

Concern Nmbr: ALT.003
Topic: Alternatives to License Renewal
Subtopic: State/NRC agreement
Associated Comment Nmbr(s): W11.020 W11.050
Concern: Representatives at the workshop from the Vermont Department of Public Service (VDPS) and the Yankee Atomic Electric Company (YAEC) suggested a new type of State agreement program. The Vermont representative suggested that the NRC consider an agreement program in which the need and alternatives evaluation for the environmental impact statement (EIS) would be performed for the NRC by the States at the time of each specific plant license renewal application. Although the YAEC representative apparently endorsed the idea of a State/NRC agreement, he disagreed with State representatives' views about designating the alternatives issue as Category 3. Specifically, he noted that the entire process would benefit if some innovative, constructive way could be found for a utility to take credit for the State assessment of the need for the plant. This would be in the public's interest because issues would be addressed in a common forum.

Response: The NRC has determined that the issue of whether the plant or power is needed should not be considered by the NRC in its NEPA decision regarding license renewal. The basis for this determination is contained in the Statement of Consideration for the final Part 51 rule. In general, since license renewal is not a mandate for, but rather the option of, continued operation, consideration of need for power or need for a particular plant is a decision that will be made by the State and utilities. The NRC will consider only the environmental impacts of license renewal compared with the range of environmental impacts of other reasonable generating sources. Therefore, given the approach in the final rule, there is no need for the NRC to rely on State determinations regarding economic issues related to license renewal. The NRC, however, will consider any available State information regarding the appropriate scope of reasonable alternatives in the site-specific SEIS. The NRC will also consider economic costs, in some cases, for the limited purpose of determining the range of reasonable alternatives for the consideration of appropriate mitigation measures.

Concern Nmbr: ALT.004
Topic: Alternatives to License Renewal
Subtopic: Economic analysis
Associated Comment Nmbr(s): 087.118
Concern: Because threshold values given in Appendix H of the GEIS were based on an economic comparison with coal-fired plants, the EPA questioned whether such a comparison is appropriate in areas of the western U.S. where geothermal energy is said to be a potential alternative to nuclear plant license renewal.

Response: The final amendments to the Part 51 rule regarding license renewal delete the requirement for performing an economic comparison of a nuclear power plant's license renewal with replacement of the generating capacity using a coal-fired plant. In addition, since consideration of economic competitiveness has been eliminated from the NRC's license renewal decision, Chapter 8 and Appendix H of the draft GEIS have been deleted. Chapter 8 of the revised GEIS discusses the alternatives to license renewal.

Concern Nmbr: ALT.005
Topic: Alternatives to License Renewal
Subtopic: Economic analysis-waste storage and disposal
Associated Comment Nmbr(s): W11.037 W11.070 W11.073 079.060 079.061
Concern: Representatives at the workshop from the VDPS and MDPS pointed out that the cost data do not reflect the disposal of waste or additional interim storage costs, and that the additional volumes of low-level radioactive waste (LLW) are also not identified in the report. Moreover, the costs which might be associated with LLW and high-level waste (HLW) disposal are embedded within the operation and maintenance (O&M) costs, but it's not clear how those O&M costs consider the future costs of LLW and HLW storage and disposal. (Vermont's written comments noted that radioactive waste disposal costs are a particularly sensitive part of nuclear plant operating and decommissioning costs; and that the cost of LLW disposal increased from $2 per ft^3 in 1974 to about $30 per ft^3 in 1989, with current projected costs for the future ranging from $150 to $400 per ft^3). The Minnesota representative commented that more detailed infomation is needed to determine how sensitive the 2.6 cents/kWh used in the GEIS is to "some very uncomfortable scenarios" for dealing with waste, and the associated cost and uncertainty involved.

Response: Since the NRC has revised its approach to eliminate consideration of economics, the consideration of nuclear O&M costs (including future LLW and HLW disposal costs) falls outside the scope of NRC's consideration. It is expected that State and utility officials' decision regarding the operation of a nuclear power plant under a renewed license will consider such economic costs. The NRC, however, will limit its decision to the environmental impacts of license renewal in comparison with the range of impacts expected from alternative sources of energy.

Concern Nmbr: ALT.006
Topic: Alternatives to License Renewal
Subtopic: Economic analysis-fuel production and waste disposal
Associated Comment Nmbr(s): W11.059 W11.060
Concern: A representative from the New York State Department of Environmental Conservation (NYSDEC) suggested that data on the amounts of energy used in the nuclear fuel cycle should be provided. In addition, the MDPS representative implied that there could be hidden subsidies for both fuel production and waste disposal; they should be identified in the analysis.

Response: The NRC has eliminated consideration of economics from its license renewal NEPA reviews. Therefore, consideration of the economics of the nuclear fuel cycle is outside the scope of its NEPA review.

Concern Nmbr: ALT.007
Topic: Alternatives to License Renewal
Subtopic: Economic analysis-units of measure
Associated Comment Nmbr(s): W11.003
Concern: A General Electric (GE) representative pointed out that the comparison of alternatives should be based on a single figure of merit (e.g., mills/kWh).

Response: The NRC has eliminated consideration of economics from its license renewal NEPA reviews. Therefore, a comparison of alternatives based on an economic figure of merit is outside the scope of its NEPA review.

Concern Nmbr: ALT.008
Topic: Alternatives to License Renewal
Subtopic: Data on nuclear generating capacity
Associated Comment Nmbr(s): W11.023
Concern: A DOE representative suggested that the nuclear generating capacity data should be updated since the GEIS used 1989 data and the more recent 1990 data have significant differences.

Response: The NRC has determined that consideration of need for generating capacity is beyond its jurisdiction for conducting a NEPA review of license renewal applications. Therefore, all nuclear generating capacity data have been eliminated from the GEIS.

Concern Nmbr: ALT.009
Topic: Alternatives to License Renewal
Subtopic: Cost of alternatives
Associated Comment Nmbr(s): W11.039 079.092b
Concern: At the workshop, a representative from the MDPS noted that recent data suggests that there are now very cheap alternatives that are becoming available. This issue should be considered because it affects the credibility of the GEIS. Similarly, the State of Vermont commented that technologies that currently have high costs may be economically attractive decades in the future, at the time of license renewal for many plants. Additionally, even if the costs of renewable technologies are higher than license renewal, where the environmental impacts are lower than license renewal, they should be analyzed in the "balancing portion" of the NEPA evaluation.

Response: The NRC will no longer consider economics in its comparison of alternative generating sources with license renewal. The NRC uses economics for the limited purpose of determining which generating sources should be considered as reasonable alternatives, which are described in Chapter 8 of the revised GEIS. In other words, the NRC will eliminate those generating sources which would clearly be unreasonable to consider in the scope of reasonable alternatives because of their economic infeasibility. As discussed in the statement of considerations, consideration of and decisions regarding alternatives will be made at the site-specific review stage. At that time, NRC staff will consider information prepared in Chapter 8 of the GEIS and any additional information regarding alternatives.

Concern Nmbr: ALT.010
Topic: Alternatives to License Renewal
Subtopic: Cost of new nuclear units
Associated Comment Nmbr(s): W11.004 W11.021 W11.029
Concern: At the workshop, representatives from the DOE, the PSCW, and GE questioned the $5,000/kW cost of new nuclear units, which is much higher than that used in the DOE and industry studies ($1,200–1,500/kW). Moreover, since it appears that the Electric Power Research Institute (EPRI) Technical Assessment Guide was not used, the Wisconsin representative asked that the source of the cost data be provided.

Response: The NRC will not consider the costs of power production in its NEPA review of license renewal applications. Therefore all data on the cost of producing power have been eliminated. The NRC also will not consider the economic competitiveness of power generation technologies. The economic decision to operate a plant is a decision appropriately reserved for State and utility officials; the NRC has no authority to regulate State and utility business decisions.

Concern Nmbr: ALT.011
Topic: Alternatives to License Renewal
Subtopic: Comparison of alternatives
Associated Comment Nmbr(s): W11.017 W11.025 W11.057 006.004 054.038 059.002 059.005 061.002 075.004 079.004 079.049 079.050 079.064 079.066 079.089b 079.090 081A.003 085.004 087.117a 087.117b
Concern: Concerns were raised regarding the approach used for comparing the alternatives. The EPA specifically stated that, if geothermal power is potentially competitive in certain areas, then GEIS Chapter 9 should have included it in the comparison of alternatives. Moreover, the EPA pointed out that any comparison of alternatives should include a discussion of the radiation dose associated with routine atmospheric emissions of naturally occurring radionuclides in the fly ash of coal plants. This point was also raised in a comment submitted by the Environmental Protection Division of the Massachusetts Office of the Attorney General, indicating that there should be more comparative analyses of the alternatives, particularly with regard to health impacts, LLW disposal, and accidents at nuclear power plants for those plants using alternative fuels.

The State of Minnesota asserted that failure to assess combinations of wind, solar, hydro, geothermal, biomass, and fossil fuel alternatives is a serious flaw since it neglects a utility's ability to serve its customers with a mix of power supply based on load characteristics, cost, geography, and other considerations.

A PSCW representative added that by focusing on conventional coal technology, the analysis did not adequately consider the full range of fossil technologies, including new coal technologies and gas-fired power plants.

A VDPS representative stated that the proposed rule 10 CFR 51.53(c)(3)(ii)(J) improperly selects "a coal-fired plant" as the only alternative to compare economically with license renewal. Such a limitation disagrees with both the supplemental notes (at 56 FR 47019) and the draft GEIS

(p. 9-1). Moreover, the variations of possible alternatives and the economic uncertainties render it impossible to reach a generic conclusion for any plant. Specifically, the Vermont electrical generation system is such that the Vermont Yankee nuclear plant does not fit within the generic envelope postulated by the GEIS, and alternatives to the renewal of its license must be evaluated on a site-specific basis.

Response: The GEIS includes a range of alternatives that the NRC has determined are reasonable means of meeting the intent of the proposed action. A site-specific SEIS will be prepared to perfom a comparison of the environmental impacts of license renewal with those of the alternatives. The NRC agrees that a mix of alternative generating sources could conceivably replace the generating capacity lost if license renewal were not chosen. However, consideration of all the various mixes of alternative energy sources would logically yield an infinite number of alternatives. The NRC and CEQ NEPA regulations require the consideration of a reasonable range of alternatives. Therefore, the NRC believes that consideration of discrete alternative sources of energy is reasonable and appropriate given the circumstances. Any comparison of economic competitiveness among alternatives, however, has been eliminated from the NRC's consideration. Therefore, consideration of a coal-fired plant as the only alternative to compare economically with license renewal has been deleted from the GEIS. (It should be noted, though, that the NRC's comparison of the environmental impacts of license renewal with the environmental impacts from the range of reasonable alternatives will inherently bound all expected environmental impacts from various combinations of alternative energy sources.)

Concern Nmbr: ALT.012
Topic: Alternatives to License Renewal
Subtopic: Comparison of alternatives
Associated Comment Nmbr(s): W11.072
Concern: A representative from the MDPS said that the health effects of longer onsite storage could be greater than officially reflected in Federal documents. Therefore, a comparison of alternatives that does not take this into consideration is seriously inadequate.

Response: The NRC agrees that both LLW and spent fuel could be stored on site for longer periods than reflected in Table S-3 (10 CFR 51.51) and supporting documentation, and thus the attendant health effects may not be accounted for in these documents. Additional information is provided in revised Chapter 6 of the GEIS, which indicates that the parameters in Table S-3 can be applied to support the long-term storage of LLW and spent fuel. Close inspection of the health effects of the nuclear fuel cycle reveals however, that injuries and disease attributable to waste management operations are quite small. Increasing the storage time for radioactive waste would result in additional exposure and radiation dose commitments, but these would be negligibly small because of rigid controls on allowable exposures.

Concern Nmbr: ALT.013
Topic: Alternatives to License Renewal
Subtopic: Comparison of impacts
Associated Comment Nmbr(s): W11.015 W11.071
Concern: A VDPS representative noted that the crucial comparison for alternatives is that of

operational emissions with additionally generated volumes of HLW and LLW. These impact comparisons do not appear clearly in the GEIS. In support of his position, the representative brought up the issue of uncertainty in siting radioactive waste disposal facilities (e.g., not clear whether a LLW disposal site can be found in Vermont; and relicensing could require a second HLW repository). He also pointed out that there is an uneven method of comparing the impacts of alternative sources (e.g., biomass or natural gas) with the impacts from license renewal. The real impacts from license renewal, which for the most part are additional HLW and LLW, are obscured by having to look through voluminous processes like Table S-3 and the waste confidence hearing. A direct comparison should be made, i.e., whether it is worse to have 20 more years of HLW and LLW as compared with wood or natural gas emissions.

Response: The NRC has revised the Part 51 rule to perform a comparison of the environmental impacts of license renewal with the environmental impacts of alternative energy sources during the individual plant review. The NRC agrees that the real impacts of license renewal (including the impacts associated with HLW and LLW) should be compared with the real impacts of alternative energy sources (including natural gas). The NRC believes, however, that this comparison may not necessarily be a "direct" comparison because the impacts do not always differ in magnitude alone. For example, a comparison of 20 more years of HLW and LLW to the toxic emissions from a fossil fuel plant is difficult because they each yield such different impacts. Therefore a "direct" or one-for-one comparison is not always possible. Often, the NRC must make comparative value judgments for these differing impacts using available environmental analyses. Appropriate analyses include specific NRC analyses codified by rule, such as the Waste Confidence Rule (WCR) (10 CFR 51.23), Uranium Fuel Cycle Environmental Data (10 CFR 51.51, Table S-3), and Environmental Impact of Transportation of Fuel and Waste (10 CFR 51.52, Table S-4). The NRC considers these analyses to be appropriate in determining the magnitude of the impacts associated with license renewal and comparing them with the impacts associated with alternative energy sources.

Concern Nmbr: ALT.014
Topic: Alternatives to License Renewal
Subtopic: Advanced nuclear technologies
Associated Comment Nmbr(s): W11.022
Concern: A DOE representative suggested that the discussion of advanced technologies differentiate between those reactor types that are being designed with passive safety features versus the modular high temperature gas-cooled reactor and the liquid metal reactor.

Response: Only research the advanced light-water reactors (LWRs) with passive safety features is being sponsored by the Federal government, therefore the modular high temperature gas-cooled reactor and the liquid metal reactor are not discussed in the revised Chapter 8 of the GEIS. (See Section 8.2.12.)

Concern Nmbr: ALT.015
Topic: Alternatives to License Renewal
Subtopic: Demand forecast
Associated Comment Nmbr(s): W11.013 W11.044 054.031 079.089a

Concern: At the workshop, representatives from the VDPS and the NYSDEC pointed out that the GEIS economic inputs for need and alternative evaluations are not accurate as stated. In its written submission, the State of Vermont reiterated this issue. Essentially, the commenters cited the following points as reasons for why they believe the evaluations are inaccurate: (1) the NEPOOL forecast for the year 2005 is for 134 TWh, 14 percent lower than the NRC's base case forecast for that year; (2) the NEPOOL forecasts in April, 1991 predicted significantly lower demand in New England relative to the 1994 forecast used in the GEIS; (3) demand side management (DSM) forecasts expected for New England are significantly higher than those used in the high conservation case in the GEIS (e.g., the GEIS assumes 5.4 percent less generation in 2000, whereas Vermont believes that 20 percent less can be achieved by the year 2000); and (4) in New York, the State policy is to reduce the "base case" forecasted demand (on top of programs in place up through 1989) by 50 percent. In addition, the State of Minnesota noted that the NRC inappropriately extrapolates short-term projections decades beyond the original author's intent and does so without explanation or justification (see p. 8-4 for demand; p. 8-6 for DSM programs; and p. 8-8 for conservation).

Response: Demand forecasting has been eliminated from the GEIS, consistent with the NRC's decision to eliminate the consideration of "need for power" from its license renewal NEPA reviews.

Concern Nmbr: ALT.016
Topic: Alternatives to License Renewal
Subtopic: Demand side management
Associated Comment Nmbr(s): W11.031 W11.038 W11.043 005.005 054.032 054.033 079.021c 079.042 079.044 079.045 079.046 079.051 079.083c 079.084 079.086 079.091 090.014 090.015
Concern: The States of Vermont, Minnesota and New York, the Minnesota Public Interest Research Group (MPIRG), and a private citizen raised concerns related to DSM. The State of Vermont believes that the NRC greatly underestimated the amount of energy reduction available by DSM measures and that a tremendous amount of energy conservation is available, albeit at increasing cost. Vermont believes that DSM should be considered as an alternative to license renewal and that the DSM forecasts given in the GEIS are pessimistic. Finally, Vermont pointed out that the amount of reliance on DSM is based, to a large extent, on Federal and State regulatory decisions on research and development. Minnesota asked whether there is a way to obtain an aggregate number for the reduction in energy demand as a result of conservation programs since the 8.4 percent reduction used in the GEIS represents an increment above what was included in the base case, which also considered conservation. This would help in comparing numbers used in the GEIS with the 20 percent reduction that some States are using. Minnesota also recommended that other data on high DSM scenarios be examined, and that the NRC look into the unfolding opportunities for conservation and DSM in the electric industry (re: *Scientific American* article). The New York representative observed (at the workshop) that the GEIS does not analyze a variety of scenarios. Specifically, there's no high-level of DSM analyzed. He felt there should be an analysis or discussion of situations where the government becomes heavily involved, that is, something more than just price-driven energy conservation. The MPIRG commented that the GEIS regional forecasts lack specific data regarding State-level forecasts (GEIS, Volume 1, Tables 8.2–8.9). These forecasts also do not reflect the higher achievement

levels and projected potentials accompanying recent State implementation of aggressive conservation programs. The private citizen stated that alternatives are preferable to license renewal because they provide very large benefits, such as DSM, and substantial savings that overwhelm any predicted savings from refurbishment and license renewal.

Commenters made the following additional points and projections for DSM:

1. The high-conservation case developed in the GEIS used an Oak Ridge National Laboratory (ORNL) report that assumed a 17 percent discount rate. The NRC should have modified the ORNL results using a 5 percent discount rate to be consistent with the nuclear plant life-extension analysis.

2. The NRC's expected 3.8 percent DSM potential for 2010 is so conservative as to suggest a "rosy scenario" comparison for license renewal. The NRC "high" conservation scenario of 5.4 percent savings by the year 2000 and 8.4 percent in the year 2010 reinforces this perception.

3. A recent EPRI study concludes that 24 to 44 percent can be saved on electrical generation, and a Rocky Mountain Institute (RMI) study projected that 75 percent can be saved. As EPRI and RMI representatives at a recent discussion on conservation potential emphasized, "the differences between these estimates are less important than their agreement that substantial amounts of electricity can be saved in a cost-effective manner."

4. The study *America's Energy Choices* found that 43 percent savings could be achieved by 2010 with aggressive government policies, enough to help offset the nuclear capacity loss for New England and for the U.S. in the year 2030.

5. A recent General Accounting Office (GAO) study on DSM, GAO/RCED-92-13, notes that in Massachusetts, California, and the Pacific Northwest States, DSM programs can satisfy over one-half of new electricity demand.

6. The 8.4 percent carried over from the need section is considerably lower than some States, such as New York and Vermont, are now considering.

7. A 1989 New York State energy forecast predicts an electricity demand growth of 1.6 percent to 2.1 percent per year between 1988 and 2008. According to some analysts, this implies that electricity demand will increase 26,000 GWh/year between 1988 and 2000. Furthermore, very little of the savings potential in existing buildings and equipment is incorporated into the State's forecast.

8. A recent estimate by Minnesota Agencies of the DSM potential for a major Minnesota electric utility projected 9 percent annual energy savings from the base forecast by the year 2010. Minnesota feels that the NRC has failed to demonstrate the basis for its DSM estimate, and that Section 8.4 of the GEIS ignores the trend change from demand side technologies, and the possible sudden losses of major industrial load due to industries leaving, closing down, or choosing to generate part or all of their own load.

9. A study done for the State of Minnesota in 1988 shows that a potential 52 percent savings through aggressive conservation exists in Minnesota. Also in Minnesota, in the recent certificate of need hearings on dry cask storage at Northern States Power's (NSP) Prairie Island (PI) nuclear facility, testimony showed that aggressive implementation by NSP of electricity improvements in commercial and industrial lighting and motors alone could almost displace the PI electricity output. During the hearing, an NSP witness allotted that utilities in the U.S. and Canada are pursuing conservation programs which will replace percentages of their systems requirements comparable to PI's contribution to NSP's system. These savings are magnified when used in combination with other generating options, such as renewable energy resources. Further, NSP allowed that at least 8,000 GWh of conservation potential existed in its service territory. One witness testified that the technical conservation potential that is cost-effective from the consumer's perspective is greater than the PI output and capacity several times over.

10. Some utilities are testing Amory Lovins' view that if maximum use were made of energy efficient technologies in U.S. homes and businesses, no new baseload generating plants would be needed.

Response: Demand forecasting, including analyses regarding the energy reduction capability of DSM, has been eliminated from the GEIS, consistent with the NRC's decision to eliminate the consideration of "need for power" and demand forecasting from its NEPA review for license renewal. DSM (i.e., conservation) and power importing are not alternative electric generation sources, but rather these are potential measures that State and utility officials could use to reduce the need for power generation, should license renewal be denied (i.e., no action alternative). Potential environmental impacts of these measures are discussed in the revised GEIS (see Sections 8.3.14 and 8.3.15).

Concern Nmbr: ALT.017
Topic: Alternatives to License Renewal
Subtopic: Biomass energy/Categorization
Associated Comment Nmbr(s): W11.007 W11.016 W11.058 054.044 079.023 090.029
Concern: The States of Vermont, Minnesota, the MPIRG, and representatives at the workshop from the NYSDEC, the VDPS, and GE pointed out that there needs to be more discussion of biomass energy as an alternative source. Minnesota noted that the discussion in the GEIS suggests the site-specific viability of biomass fuel, which means that the issue of alternatives cannot be defined as Category 1. Moreover, the NRC does not appear to consider a biomass fuel scenario using plantation wood production. Instead, it assumes that previously undisturbed land will be harvested for biomass fuel, resulting in associated negative impacts. Vermont believes that wood gasification technology may prove to be environmentally preferable to nuclear license renewal, and that elimination of biomass as an option on economic grounds cannot be reasonably concluded at this time. The GE representative observed that the GEIS does not account for the significant amount of land that is required for biomass energy.

The MPIRG submitted extensive comments relating to biomass energy. The MPIRG noted that the NRC concludes that "biomass power is a source of baseload capacity that could be used to replace or offset nuclear capacity, where it is found to be economical. However, biomass power

production does not offer a significant environmental or economic advantage over license renewal. Therefore, biomass power is not clearly a preferred near-term alternative to license renewal" (GEIS, Volume 1, p. 9-19). The MPIRG argues that the advantages, both economic and environmental, are far superior than the NRC might like to think. The MPIRG presented information from testimonies at a hearing regarding the addition of an Independent Spent Fuel Storage Installation (ISFSI) at the Prairie Island generating plant.

Based on those testimonies, the MPIRG believes that the conclusions about biomass in the GEIS are very shortsighted. The environmental and economic advantages of biomass clearly outweigh those of nuclear power. Granted, nuclear power is not contributing significantly to global warming, but is it helping to decrease it? Nuclear power also has enormous safety concerns surrounding it, including operation and radioactive waste. The amount of jobs created through the relicensing of nuclear plants cannot compare to the enormous amount of employment attributed to biomass technology.

Response: A discussion of the environmental impacts of biomass has been included in the GEIS analysis of alternatives (wood/wood wastes and energy crops). Biomass is considered to fall within the range of reasonable alternatives.

Concern Nmbr: ALT.018
Topic: Alternatives to License Renewal
Subtopic: Coal impacts
Associated Comment Nmbr(s): W11.005 W11.026 W11.028 005.006 005.007 054.036 075.020
Concern: The State of Minnesota, a private citizen, and representatives at the workshop from the PSCW and GE recommended revisions and/or additional discussion related to coal plants. They made the following points:

1. The GEIS should recognize that coal plants larger than 75 MW should be able to operate for 40 years. Furthermore, the GEIS assumes that coal plants smaller than 300 MW will not be refurbished. (It is not clear whether the NRC considered plant life extensions with new boiler technologies and/or different fuels.)

2. The potential sale of coal byproducts, such as slag (from sulfur) and ash, is not discussed. (Wisconsin utilities sell 35 to 83 percent of the ash generated at coal-fired plants.)

3. Table 9.1 does not clearly show the magnitude of differences in emissions for three fossil fuels. Also, State air regulations (e.g., Wisconsin) require the control of fugitive dust.

4. The environmental impact of the use of high-sulfur coal in the uranium enrichment process is not considered. Moreover, since uranium used by U.S. power plants comes from other countries, emissions from uranium enrichment operations significantly affect the environments of those countries.

Response:

1. The revised GEIS includes "Delayed Retirement of Existing Non-Nuclear Plants" as one of the alternatives to license renewal. By 1998, the DOE estimates that 3,500–3,700 coal-fired plants will be 30 years old or older, making them candidates for repowering. The revised GEIS concludes that adverse environmental impacts from current plants should be reduced with repowering. SO_2 could be reduced by 90–99 percent and NO_x from 60–92 percent depending on the technology. If repowered plants are switched from once-through cooling to closed-cycle cooling, substantial benefits to aquatic biota could also occur, since millions of gallons of water each day could remain in the natural water body. The revised GEIS also does not include any repowering decision assumptions that use the size of a coal-fired plant as an influencing factor.

2. The GEIS has been revised to indicate that solid waste generated by coal-fired plants can be reduced by sale of slag and ash for other purposes.

3. The revised GEIS (Chapter 8) indicates in qualitative terms that air emissions of pollutants from oil and gas-fired plants are less than from coal. Factors, including type of coal, plant age, efficiency and types of pollution control equipment, contribute to a wide variation in emissions from one plant to another.

4. The GEIS now notes for advanced LWRs, "Approximately 400 ha or 1,000 additional acres would be committed to uranium mining and processing during the life of the advanced LWR. Impacts should be similar to those of other clearing and land-use operations associated with uranium mines and mills and would involve some adverse air and water quality impacts and health risks." The GEIS does not assess impacts occurring in other countries as a result of their domestic policies.

Table S-3 (10 CFR 51.51) provides estimates of the emissions from coal-fired plants that provide electricity to uranium enrichment plants per reference reactor year. The revised Chapter 6 addresses the impacts of the uranium fuel cycle.

Concern Nmbr: ALT.019
Topic: Alternatives to License Renewal
Subtopic: Cogeneration
Associated Comment Nmbr(s): W11.019 W11.045 W11.046 W11.047 056.014 090.017
Concern: The DOI and the MPRIG, in their written comments, as well as representatives at the workshop from the MDPS, the VDPS, the PSCW, and a public interest group pointed out that the GEIS should consider cogeneration as a viable alternative source of power. Although very location specific, cogeneration can be economically competitive. It also requires less water and has fewer impacts on fisheries than existing nuclear power generation technology.

The MPIRG commented that non-utility generation, much of which is from cogenerators, should be broken out in the GEIS (Volume 1, p. 8-10). State legislatures are pushing for more non-utility generation, and estimates for its contribution to the reduction of electricity generation requirements will change and vary from region to region. Because it is not known how big this contribution will be 10, 20, or 30 years from now, it is unwise to lock it in at speculative levels set by a Category 1 classification based on 1989/1990 projections.

Response: The revised GEIS does not specifically address the issue of cogeneration as a separate alternative, although it is discussed under the natural gas and wood/wood waste alternatives. The NRC's NEPA review for license renewal will be limited to a comparison of the environmental impacts from license renewal with those from discrete alternative generating sources. Since cogeneration plants utilize existing conventional generation technologies, their environmental impacts are effectively bounded by the analyses of the discreet alternative generating sources. The GEIS analysis does not make any distinction regarding utility and non-utility operation because this has no bearing on the environmental impact. Further, the NRC has eliminated consideration of need for power and any analyses of power demand from its NEPA review for license renewal.

Concern Nmbr: ALT.020
Topic: Alternatives to License Renewal
Subtopic: Geothermal power
Associated Comment Nmbr(s): W11.006 W11.056 054.043
Concern: Representatives from MDPS and GE, at the workshop, and the State of Minnesota in a subsequent written comment raised the following concerns regarding the treatment of geothermal energy in the GEIS. Minnesota pointed out that the NRC must, at the very least, recognize that geothermal power must be assessed for plants in most States. The GEIS excludes scenarios where geothermal energy production is part of a portfolio of alternatives, or where low-quality resources, such as groundwater heat exchange heat pumps, are used. Additionally, Minnesota suggested that the pending reauthorization of the Resource Conservation and Recovery Act (RCRA) be considered in the GEIS since this might have an effect on the reinjection of waste effluents back into the ground.

The GE representative pointed out that the analysis of geothermal power, particularly for California, should consider the impacts of the Clean Air Act of 1990 (CAA), which may require geothermal plants to get permits for atmospheric emissions. He noted that there also may be some additional EIS or justification needed before waste effluents are injected back into the ground.

Response: Geothermal technology has been considered in the revised GEIS and, where appropriate, will not be eliminated from the range of reasonable alternatives considered in the site-specific SEISs. Since the NRC's review will be limited to a consideration of the environmental impacts, any negative economic impact associated with compliance with the CAA is beyond the scope of the NRC's NEPA review for license renewal.

Concern Nmbr: ALT.021
Topic: Alternatives to License Renewal
Subtopic: Imported power
Associated Comment Nmbr(s): W11.018 W12.022 079.021a 079.024 079.025 079.028a 079.029c
Concern: A representative from the VDPS at the workshop, and the State of Vermont in a subsequent written comment suggested that purchased power from Canada be analyzed as an alternative to license renewal, and that the generic impacts from purchasing power from Canada be included in Table 9.1. (The purchase of power from Canada would appear to offer significant environmental advantages over license renewal for the State of Vermont.) The representative also

suggested that the NRC's authority and responsibility under NEPA to evaluate the environmental impacts of this alternative and the legal ramifications of this, if any, be addressed.

Response: The environmental impacts of conservation and power importing are discussed in the revised GEIS, not as electric generation sources, but rather as consequences of denying license renewal (i.e., the no action alternative) and as tools that State and utility officials can use to reduce the need for power generation.

Concern Nmbr: ALT.022
Topic: Alternatives to License Renewal
Subtopic: Natural gas
Associated Comment Nmbr(s): W11.033 079.026 079.029a 079.093
Concern: The State of Vermont commented that the exclusion of natural gas from consideration as an alternative so far in advance of specific plant application, based on uncertain economic forecasts, is undesirable. The relatively low level of air pollution emitted from combined cycle technology plants make them attractive from an environmental perspective, and relatively low construction and operating costs make them economically attractive. A representative at the workshop from the NYSDEC also pointed out that there is a very large potential for natural gas in New York, which is very price competitive when combined as a cogeneration facility.

Response: Natural gas has been considered in the revised GEIS and will not be eliminated from the range of reasonable alternatives in the site-specific SEISs. However, the consideration of the economics of various power generation technologies (i.e., construction and operating costs) has been eliminated from the NRC's NEPA review for license renewal unless consideration of such economic factors are essential to determining whether an alternative is viable and thus should be considered as part of the reasonable range of alternatives discussed. Therefore, any consideration of the price competitiveness of natural gas when combined as a cogeneration facility is beyond the scope of the NRC's review.

Concern Nmbr: ALT.023
Topic: Alternatives to License Renewal
Subtopic: Photovoltaics
Associated Comment Nmbr(s): W11.032 W11.040 054.040 093.005
Concern: At the workshop, representatives from the MDPS and the NYSDEC noted that although photovoltaics are unlikely to be a big supply source, they could at some point be very important on the demand side. Hence they believe that these types of analyses should be included in the GEIS.

In its written comments, the State of Minnesota noted that the NRC's brief assessment of solar photovoltaic systems fails to consider the possibility of significant technological change in coming decades or its effect on relicensing applications for plants located in areas of relatively greater solar photovoltaic potential. Moreover, the analysis uses capital costs for solar photovoltaic capacity that are 145 percent of those used by other government utility regulators; and neglects the possibility of declining costs in the future. Also, the NRC's analysis focuses only on large-scale facilities. The NRC's own estimate demonstrates that solar photovoltaic capacity in 2020 could

provide one-eighth of the aggregate of the nuclear power lost should nuclear plant licenses not be renewed.

The New England Coalition on Nuclear Pollution, Inc. (NECNP) disagreed with the GEIS assumption that land use is a major negative impact of photovoltaic technology. The assumption is based on the requirement for new land, which the Coalition believes will not be required. Currently, the technology is primarily used in remote applications requiring available roof area and not new land. Furthermore, the International Council of Shopping Centers reported in 1991 that 4.5 billion square feet of retail space exists in shopping malls. This roof area could support photovoltaic facilities with a capacity of 13,950 MW using the 7,400 acre per 1,000 MW standard indicated in NUREG-1437, Volume I, page 9-9. This is equivalent to 14 large nuclear power plants and has no land use impact.

Response: Based on the NRC's decision to neither consider the issue of need for power nor perform any analyses of power demand in its license renewal NEPA reviews, any consideration of photovoltaics in either regard is beyond the scope of the NRC's review. However, the NRC considers photovoltaic technology as a discrete electric generation source and will not eliminate it from the range of reasonable alternatives. The revised GEIS discussion of the photovoltaic technology as an alternative energy source considers all the expected environmental impacts from this technology, including large land use requirements. Although it is theoretically possible to site photovoltaics on the roof tops of shopping malls, it is highly unlikely that a significant portion of a State's electric generation needs would be met solely this way. The distribution and control networks required for such an arrangement would prove highly problematic. In a more likely scenario, photovoltaics could be used to provide immediate power to service the buildings on which they are mounted, such that a reduction of a utility's power demand is achieved. As mentioned above, this is beyond the scope of the NRC's review. It should be noted that the NRC's lack of consideration of a particular variation of power generation, theoretical or otherwise, in no way precludes a particular State or utility from proceeding with such an alternative. The NRC cannot possibly analyze all conceivable combinations of alternative energy sources in its NEPA reviews. Therefore, the NRC has limited its review to a reasonable range of alternatives that, it believes, are representative of available technologies.

Concern Nmbr: ALT.024
Topic: Alternatives to License Renewal
Subtopic: Pumped hydro
Associated Comment Nmbr(s): W11.062 W11.067 054.042 079.022
Concern: The States of Vermont and Minnesota pointed out that, in combination with other alternatives, hydropower is a significant potential resource that should be considered in nuclear plant relicensing applications. A representative from the MDPS at the workshop suggested that, if pumped hydro is considered, the assessment of environmental impacts should include the power purchased to pump the water up the hill and the emissions based on the amount of consumed energy. Finally, a GE representative at the workshop noted that pumped hydro offers a significant energy storage capacity, but is not mentioned in the document. (There are about 35 plants in the U.S. with pumped hydro storage at about 17,000 MW of capacity.)

Response: The NRC has decided that consideration of economics and factors other than environmental impacts are beyond the scope of its NEPA review for license renewal. Thus, it will consider only the environmental impacts of license renewal compared with the range of environmental impacts of other reasonable generating sources. Pumped hydro was not considered as an alternative energy source because it does not have the potential for being a discrete electric power generation source. Since pumped hydro consumes power pumping the water back into the reservoir during low power demand periods, it serves only as a method for reducing the overall cost of meeting power needs during high demand periods and for providing system reliability.

Concern Nmbr: ALT.025
Topic: Alternatives to License Renewal
Subtopic: Solar energy
Associated Comment Nmbr(s): W11.008 W11.064 054.041
Concern: The State of Minnesota noted that the conclusions reached in the GEIS regarding solar thermal power are based on considering this alternative in isolation from other alternatives. As with solar photovoltaic systems, the NRC's assessment focuses on large-scale facilities. Many solar thermal applications are more like DSM. Consequently, environmental impact issues related to remote locations, transmission line corridors, and land use are all improperly addressed. At the workshop, a GE representative noted that a system using lined focusing troughs should be incorporated into the analysis of solar energy since heliostats and receivers are typically only used for central station solar thermal plants. (Concern ALT.029 is also on solar energy.)

Response: DSM applications of solar energy are focused on reducing the requirements for power generation. The NRC has decided not to consider the issue of need for power, therefore, consideration of the DSM application of solar power is not addressed as discrete alternative energy source in the revised GEIS. DSM, however, is a factor in the NRC's consideration of conservation contained in the GEIS. The NRC considers the supply side application of solar power in the revised GEIS and provides an analysis of its environmental impacts.

Concern Nmbr: ALT.026
Topic: Alternatives to License Renewal
Subtopic: Wind power
Associated Comment Nmbr(s): W11.041 W11.061 W11.065 W11.066 W11.068 054.039 090.028
Concern: Comments regarding wind power made at the workshop by representatives of the MDPS and GE, as well as those submitted in written form by Minnesota and the MPIRG are as follows:

1. Wind power generation could be a feasible alternative for certain States (e.g., Minnesota).

2. The synthesized wind data (1977 data) presented in Figure 9.1 should be updated since there is a 1988 version of the map.

3. The land that is most likely to be used for wind generation is agricultural, not undisturbed land, so the environmental impact could change. (Regarding the loss of agricultural land as

an impact, Minnesota noted that experience in California indicates that dual use of land for wind power and agriculture can actually increase land values.)

4. The GEIS states that the reason wind turbines are spread over a large area is to mitigate agricultural and economic losses or to provide for multiple land use, but the real reason is to minimize turbulence and maximize energy capture.

5. The assessment of the environmental impact of wind power should consider its placement, similar to that used for placing power lines and pipelines.

6. Capital costs provided by the NRC are 112 to 150 percent those estimated in the report "Minnesota's Wind Energy."

7. The NRC should incorporate a sensitivity analysis using capital costs for wind power equal to $1.41/kW (single turbine cost) and $775/kW (100 unit cost) as provided in the aforementioned Minnesota report.

8. The discussion of wind power siting in a forested region is highly improbable.

9. The NRC's own analysis (see GEIS, pp. 9-1 to 9-5) indicates that wind power is a potential alternative which must be considered in the relevant timeframe.

Response:

1, 9. Wind power has been considered as an alternative energy source in the GEIS and will not be eliminated from the range of reasonable alternatives. The consideration of wind power entails an analysis of the expected environmental impacts from wind generation.

2, 3, 4, 5, 8. The GEIS has been revised to reflect the points made by the commenters.

6, 7. The NRC has decided to eliminate consideration of economics from its license renewal NEPA review in comparing alternatives to the proposed action. Therefore, discussions regarding capital costs and sensitivity analyses for capital costs of wind power is now beyond the scope of the NRC's review.

Concern Nmbr: ALT.027
Topic: Alternatives to License Renewal
Subtopic: Compressed air
Associated Comment Nmbr(s): W11.063
Concern: A GE representative pointed out that compressed air is also maturing as an energy storage technology. The first plant (110 MWe with 26-hour capacity) is being operated by the Alabama Electric Cooperative.

Response: Compressed air is an energy storage technology and is beyond the scope of the alternatives to the proposed action. The alternative energy sources considered in the GEIS are discrete electric generation sources.

Concern Nmbr: ALT.028
Topic: Alternatives to License Renewal
Subtopic: Impacts of license renewal
Associated Comment Nmbr(s): W11.074
Concern: A NYSDEC representative observed that the relicensing process and additional 20 years of plant operation provides an opportunity to look at new mitigative technologies. If a plant is going to be operating for an extended period of time, there seems to be a greater responsibility to ensure that significant impacts are addressed over the 20 or 30 years of extended operation, and this could warrant the additional capital expenditures.

Response: The revised GEIS addresses, where possible, mitigation of the environmental impacts of license renewal. Also, the revised rule specifies that the site-specific SEIS must address mitigation of any environmental impact for which mitigation was not addressed in the GEIS.

Concern Nmbr: ALT.029
Topic: Alternatives to License Renewal
Subtopic: Solar energy
Associated Comment Nmbr(s): 061.003
Concern: The public interest group, Ohio Citizens for Responsible Energy (OCRE) indicated that the potential contribution of solar energy as an alternative to nuclear power may be greater than that stated in the GEIS. Whereas the GEIS assumes that solar thermal energy must be converted to electricity, this ignores the optimal use of solar technology, with its point-of-use installation of rooftop collectors. The direct use of solar energy for space and water heating is more efficient than conversion to electricity, and the installation of collectors on rooftops precludes the need for large remote "farms". (Concern ALT.025 is also on solar energy.)

Response: The direct use of solar technology for energy purposes without electric conversion, such as rooftop heating collectors, are not considered in the solar energy alternative because the NRC based the scope of alternatives on the purpose and need statement, which limits alternatives to different methods of electric generation.

Concern Nmbr: ALT.030
Topic: Alternatives to License Renewal
Subtopic: Analysis of alternatives/Conservation
Associated Comment Nmbr(s): 001.002 061.004 079.021b 079.052 079.053 079.054 079.055 088.001 090.023 090.026 097.004
Concern: The State of Vermont, the MPIRG, the Cape Cod Commission, the OCRE, and two private citizens all raised the issue of conservation and efficiency in relation to the analysis of alternatives. The following points were made:

- The NRC does not adequately address conservation (which may reduce energy needs), efficiency, and storage technology (e.g., pumped storage) as alternatives to license renewal. Moreover, the savings associated with aggressive conservation/load management strategies are significant.

- The NRC's assumption that relicensing is necessary to meet the energy capacity requirements of service areas does not allow consideration of viable alternative energy sources being developed such as wind, solar, photovoltaic cells, hydropower, biomass, and solar thermal power. Dismissal of these options due to technological, availability, or economic reasons is inappropriate at this time since renewal would not begin until 2010 and beyond. Even if their eventual costs are higher, their environmental impacts are lower, and they should be analyzed in the balancing portion of the NEPA evaluation.

- Nuclear power plant licenses will not expire all at once, but in a staggered fashion. In 2005 only 1 x 10^9 kWh will need replacement; in 2010 only 13 x 10^9 kWh. Only after 2010 will the figure climb at an accelerated pace. The staggered expiration pattern of nuclear plants means that conservation, efficiency, and renewables need not be available at once in 2010 to replace the 108 GW x 60 percent capacity factor = 64.8 GW now generated by nuclear power plants. Thus, a Category 1 classification is unjustified and would unwisely lock in electrical energy policy that may need changing 20 years from now.

- The NRC's assessment of the possibilities that renewable energy resources have to offer in replacing retired nuclear plants is overly pessimistic. Volume 1 of the GEIS shows that a combination of renewables could provide much more energy than would be lost through expired licenses. Graphs 1 and 2 show a cumulative effect of the loss of nuclear power plants and the corresponding amount of energy produced by renewables for a period of 30 years. As is apparent from the graphs, renewable energy resources have serious potential in contributing to the overall energy picture.

(These comments are also reflected in concerns ALT.017, ALT.020, ALT.021, ALT.022, ALT.023, ALT.024, ALT.025, ALT.026, ALT.027 and ALT.029 which speak to the benefits of the individual technologies mentioned above.)

Response: The GEIS has been revised to eliminate the Category 1 designation for alternatives to license renewal. The GEIS no longer dismisses any reasonable energy technology and consequently, considers a wide range of renewable energy sources as viable alternatives to license renewal. Additionally, the GEIS addresses conservation of energy and power import as alternatives that States and utilities may use to reduce their need for power generation capacity or as possible consequences of denial of a renewed license. However, consistent with the NRC's elimination of need for generating capacity analysis and economic cost-benefit balancing and its focus on environmental impacts, the economics of conservation measures and the ability of these measures to meet capacity requirements are no longer factors in the NRC's NEPA review of license renewal applications.

The rule has been revised to require a site-specific review of alternatives to license renewal. The NRC will consider the environmental impacts of license renewal and the alternatives in making a license renewal decision. However, it will neither consider the economics of the range of alternatives nor the issue of need for generating capacity in license renewal reviews.

Concern Nmbr: ALT.031
Topic: Alternatives to License Renewal
Subtopic: Analysis of alternatives/site-specific analysis
Associated Comment Nmbr(s): 061.008
Concern: OCRE commented that it is essential to examine all the available options for generating electricity on a site-specific basis, which includes (1) the costs and benefits of incorporating severe accident mitigation design alternatives (SAMDAs) in existing facilities; (2) license renewal without incorporating SAMDAs; (3) building a new nuclear power plant; and (4) using non-nuclear generating capacity. The commenter believes this is the only way to fulfill NEPA's mandate to assess alternatives.

Response: The site-specific SEIS will include a comparison of the environmental impacts of license renewal with the environmental impacts of alternative generating sources. This comparison includes nuclear as well as non-nuclear generating capacity. As part of the license renewal process, the NRC has also decided to consider the mitigation of severe accidents for those plants where such consideration has not been included in a final EIS (FEIS) or related supplement. (See the Statement of Considerations for the final rule for a detailed discussion of the NRC's consideration of severe accident mitigation alternatives.)

Concern Nmbr: ALT.032
Topic: Alternatives to License Renewal
Subtopic: Analysis of alternatives/Economic analysis
Associated Comment Nmbr(s): 097.003
Concern: On the economic analysis of alternatives, a private citizen noted that the GEIS does not provide a detailed cost analysis that includes all operating costs of the plants.

Response: As discussed in more detail in previous responses the NRC has decided not to consider economics in its license renewal NEPA decision; therefore, the discussion of alternative energy sources in the revised GEIS does not include detailed cost analysis.

Concern Nmbr: ALT.033
Topic: Alternatives to License Renewal
Subtopic: Analysis of alternatives
Associated Comment Nmbr(s): 054.007 064.003 075.004a 079.028b 079.029b 079.085 086.006 090.004 090.024 090.027 093.004
Concern: The States of Vermont and Minnesota, the PSCW, the MPIRG, the NECNP, Trout Unlimited, and the Union of Concerned Scientists (UCS) disputed the NRC's generic finding that the alternatives to license renewal offer no advantage. They believe that alternatives to license renewal cannot be considered generically for the following reasons:

1. The potential contributions of demand side and renewables are substantially less than expected or projected in other referenced documents. It is inconsistent that a scenario for renewable resource development based on aggressive government policies for research, development, and demonstration (RD&D) is used in the calculation of energy deficits in Appendix H of the GEIS, but the scenario is dismissed in the main body of the GEIS. The

States believe that the proper approach is to use the amount of energy that could be realized if government policies were directed towards the realization of the full potential for renewables, and to assess their actual status at the time that the resource decision has to be made. Consequently, renewable energy alternatives may offer significant environmental advantages over license renewal.

2. The comparative costs and benefits of renewable sources versus nuclear relicensing must be evaluated on a case-by-case basis, and environmental impacts should be considered. Each plant, when applying for license renewal, should be required to do a complete study of cost-effective combinations of alternatives to license renewal, including environmental costs (i.e., fuel, O&M, storage, and decommissioning). Additional items to be considered in comparing alternatives are DSM, load management, and the importance of individual facilities to regional energy delivery systems. The MPIRG noted that renewable energy technologies (RETs) are not hindered by the lack of resources, rather their development depends greatly on institutional factors. MPIRG believes that utilities must become actively involved in gaining a better understanding of emerging technologies so that they can assist in a change to a renewable energy future. Allowing license renewal applicants to avoid addressing the RET possibilities in their service areas hinders the advancement of clean, efficient power generation.

3. Most RETs should be commercially competitive with conventional energy sources within the timeframe established by the NRC. Resource availability will not pose a significant constraint for most renewable energy sources. Analysis (*America's Energy Choices: Investing in a Strong Economy and a Clean Environment*, 1991) indicates that a combination of improved energy efficiency, renewable energy sources, and "clean" fossil-fuel sources could meet all U.S. energy needs in 40 years without relicensing nuclear power plants or constructing new ones. A table in NUREG-1437, Vol. 1, Chapter 9 suggests that 270 percent of the energy provided by nuclear power could be replaced by a combination of wind, solar photovoltaics, biomass, hydropower, and natural gas.

4. The GEIS approach is flawed in that it did not consider the aggregate contribution of renewable energy sources to replace nuclear power. Also the GEIS failed to consider the fact that the combinations of alternative energy sources to replace nuclear power will vary from region to region.

5. The GEIS fails to give any credence to the possibility that the U.S. might not need nuclear power at all in the future. The U.S., with its wealth of technology, has the opportunity to become a world leader in clean, renewable energy generation. The study, *America's Energy Choices*, also projects that if aggressive policies emphasizing energy efficiency and clean, RETs were adopted, the following would be achieved: (a) cut our projected national energy requirements in half by 2030, with renewable energy contributing more than 50 percent of the energy supply; (b) save consumers and industry $5 trillion in fuel and electricity bills over the next 40 years, while costing about $2.7 trillion for new technology investments, for a net savings of $2.3 trillion; and (c) lower carbon dioxide emissions more than 25 percent from 1988 levels by 2005, and more than 70 percent by 2030.

Response: The GEIS and Part 51 rule have been revised to eliminate any generic conclusion regarding the acceptability of license renewal over other alternative energy sources prior to the site-specific license renewal review. Additionally, the NRC will not make any judgments regarding the acceptability or unacceptability of alternative energy sources or DSM programs. However, a generic analysis of the expected environmental impacts associated with conservation is included in the revised GEIS. The GEIS also considers the environmental impacts of renewable energy sources. The GEIS and Part 51 rule no longer consider the economic costs and benefits of alternative energy sources relative to license renewal and no longer address the issue of whether electric power (via nuclear or non-nuclear) is needed. The issue of utility economics and whether a particular plant is needed are decisions reserved for State and utility decision makers.

With regard to consideration of a mix of alternative energy sources, the NRC recognizes that combinations of various alternatives may be used to replace the power generated by extending the operating life of nuclear power plants beyond 40 years; however, the number of such combinations could be infinite and consequently unmanageable in a NEPA review. Therefore, the NRC believes that a consideration of the environmental impacts of individual alternatives is more appropriate. Moreover, the NRC believes that the environmental impacts of individual alternatives bounds the impacts from mixes of alternatives.

Concern Nmbr: ALT.034
Topic: Alternatives to License Renewal
Subtopic: Economic analysis
Associated Comment Nmbr(s): 075.021
Concern: The PSCW noted that the EPRI Technical Assessment Guide (EPRI P-6587-L, Vol. 1, Rev. 6, September 1990) has recent cost estimates for several technologies. Costs for fossil fuel power plants should include the cost of SO_2 allowances in the operating costs. Future legislation regarding global warming may require purchase of offsets for CO_2 emissions (See draft GEIS, Vol. 1, Chapter 9; Vol. 2, Section H).

Response: The revised GEIS only discloses the environmental impacts of license renewal and other alternative energy sources. It no longer includes any economic or cost-benefit analysis.

Concern Nmbr: ALT.035
Topic: Alternatives to License Renewal
Subtopic: Air quality
Associated Comment Nmbr(s): 063.015 080.005
Concern: NUMARC commented that the GEIS analysis should consider the economic and environmental impacts of the CAA, specifically, the mandates setting of a 10 million ton cap on SO_2 emissions and a 2 million ton per year reduction in NO_x for fossil fuel plants. Consolidated Edison provided a similar comment, and said that the GEIS should more fully develop the air quality (air emissions avoidance) consequences of license renewal policies, particularly since nuclear power generates no CO_2, NO_x, or SO_2 emissions. The utility believes that such a consideration should be paramount in evaluating various Part 51 alternatives.

Response: Except in limited circumstances as discussed in the response to Concern ALT.009, the NRC no longer considers the economics of license renewal or any other alternative energy source in its NEPA review for license renewal since it has determined that State and utility officials are responsible for addressing the economics issue as part of their energy systems planning activities. The NRC only considers the environmental impacts of license renewal in comparison with the environmental impacts of a reasonable range of alternative energy sources. This consideration includes the comparison of the environmental impacts from toxic emissions of fossil plants with the impacts of expected effluents from a nuclear power plant.

C-2. Topic: Aquatic Ecology (AQE)

Aquatic Ecology (AQE)

Concern Nmbr: AQE.001
Topic: Aquatic Ecology
Subtopic: Aquatic ecology-refurbishment/Categorization of issues
Associated Comment Nmbr(s): W03.004 031.007 081.004 081A.004
Concern: A representative of the NYSDEC disagreed with the NRC conclusion that nearly all aquatic ecology issues are minor. In particular, he pointed out that the ecological impact of cooling water withdrawal continues to be a major concern primarily because of high water use. If nuclear plants are to be operating for an additional 20 years, he recommends that the NRC include consideration of current standards of mitigative technology in the GEIS, so in that they have their intake and discharge configuration reviewed as if they were a new facility. He indicated that, since many licensed and operating nuclear power plants received their condenser cooling system approval prior to the advent of new technologies, the best available technology (BAT) that is economically achievable may be different given the additional 20 years of plant life. Thus, system retrofits may be appropriate for mitigation of the impacts.

The New York State Energy Office (NYSEO), the Maryland Department of Natural Resources (MDNR), a public interest group (the Nuclear Infomation and Resource Service [NIRS]), and a private citizen commented further on this concern. NYSEO voiced the concern that NRC has failed to consider the long-term aquatic impacts from continued operation and submitted the same suggestions as above. In addition, the agency recommended that site-specific evaluations be made for each plant where aquatic impacts are of concern, making it a Category 2 issue.

NIRS disagrees with the proposed Part 51 conclusions on the effects of nuclear power plants on water and marine life. A 1989 Marine Review Study financed by a Califomia utility found that San Onofre-2 and -3 seawater cooling systems kill between 21 and 57 tons of fish per year. The systems also take in and discharge so much seawater that they spread out sediments and other debris, which clouds the water. The underwater light is reduced to as little as 16 percent, which hampers the development of juvenile kelp. Additionally, Fermi-2 and other Great Lakes reactors are using chlorination and molluscicides to control zebra mussels and Asiatic clams. Furthermore, more fish have been killed by the Salem plant than have been caught commercially.

The private citizen is concerned that the older plants do not uniformly reflect the implementation of later findings and requirements, and most do not meet the most current, basic, specifications for a nuclear power plant. Citing the results of the above referenced Marine Review Study, he commented that the issues of degradation and destruction of the marine environment resulting from ocean water intake/outflow need to be raised at renewal hearings.

Response: For those aquatic ecology issues that are Category 1, the GEIS analysis finds that implementation of mitigative measures developed for each nuclear plant site to control impacts during and since the original plant construction will minimize adverse effects on aquatic ecology. With regard to the suggestion that the NRC include consideration of current mitigation standards in the GEIS, this is already implicitly considered. The information gathering effort to support the GEIS included consultation with other agencies, review of recent literature, and obtaining information directly from the utilities. Furthermore, Section 511(c) of the Clean Water Act

(CWA) prohibits the NRC from imposing any limitations other than those imposed under the Act. Accordingly, the NRC will defer to those agencies responsible for implementing the requirements of the CWA (through issuance of National Pollutant Discharge Elimination System [NPDES] or State Pollutant Discharge Elimination System [SPDES] permits) to ensure that the license renewal impacts on aquatic ecology are mitigated.

The commenters offered other examples of residual aquatic impacts that they believe are not acceptable. The periodic review of the NPDES permit every five years constitutes a mechanism for addressing and further mitigating such impacts. Mitigation need not await license renewal. The NRC will continue to accept the determination of the magnitude of the impact implicit in the CWA permits and approvals.

Concern Nmbr: AQE.002
Topic: Aquatic Ecology
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W03.009
Concern: A representative of the Arizona Department of Environmental Quality (ADEQ) did not understand why some NPDES permit-related issues were designated Category 2 and others were designated Category 1. It appears that issues related to aquatic fauna are Category 2, and discharge or water use conflicts are designated Category 1, even though issues in both areas have to go through the same NPDES permitting process.

Response: The GEIS has been revised substantially and the issue categories are defined in clearer terms. In general, the water quality issues designated in the GEIS as Category 1 are those issues that are expected to have the same level of significance for all plants or for a set of plants with specified characteristics (e.g., plants with once-through cooling systems versus plants using cooling ponds). The conclusion of whether an issue is Category 1 or 2 does not depend on whether or not the plants have to comply with other permitting requirements (e.g., NPDES or CAA permits). However, in the case of water quality, the NRC will defer to the agencies responsible for issuing the NPDES or SPDES permits to determine the magnitude of impacts to the aquatic environment and specifically to determine the need for mitigation.

The NRC also notes that the issue of potential water use conflict for plants with once-through cooling systems is Category 1, but it is Category 2 for plants with closed-cycle cooling systems or for those that use cooling ponds.

Concern Nmbr: AQE.003
Topic: Aquatic Ecology
Subtopic: Heat shock-once through
Associated Comment Nmbr(s): W03.012
Concern: A Virginia Power representative suggests the use of the term "thermal discharge effects" instead of "heat shock".

Response: Relevant portions of the GEIS have been examined to ensure that the proper term is used.

Concern Nmbr: AQE.004
Topic: Aquatic Ecology
Subtopic: Aquatic issues-Riparian zones
Associated Comment Nmbr(s): W03.013 W03.014 018.001
Concern: At the workshop, a representative of the ADEQ identified two specific areas in which the GEIS should be more inclusive: (1) the issue of "riparian zones" should be addressed since the vegetation region along a water course can be affected by water withdrawal and is important in maintenance of the habitat; and (2) aquatic insects should be included, along with fish and shellfish, under aquatic ecology in the GEIS because of their role in the food chain.

Nuclear power plants have the potential to impact riparian zones in the following ways:

- Refurbishment or maintenance activities can damage or destroy riparian systems, potentially impacting threatened or endangered species.

- Water use conflicts can reduce available water for in-stream uses and affect groundwater levels in arid regions.

- Discharges via air (e.g., salt drift) or water can adversely affect riparian vegetation.

- Vegetation removal and/or water level fluctuations due to water discharges can destabilize stream banks.

- Thermal releases can affect riparian vegetation.

Additionally, aquatic insects can potentially be impacted by thermal discharges.

The ADEQ reiterated this same concern in its formal written comments and provided additional amplification regarding the importance of the riparian zone and aquatic insects.

Response: In response to the comment on riparian zones, a statement has been added in Section 3.6 of the GEIS to indicate that riparian habitat is an important resource. A description of the potential effects of consumptive water use on riparian zones has been added in Section 4.3.2.1. The section on "Premature Emergence of Aquatic Insects" has also been revised to better explain how heated discharges from nuclear plants can impact aquatic insects that inhabit the bottom areas influenced by the thermal plume.

As to the effect of consumptive water use on riparian zones, the discussions of water use and availability in Chapter 4 specifically address the impacts on riparian plant and animal communities.

Regarding the effects on threatened or endangered species in riparian zones, under the new definition of a Category 2 issue, impacts on threatened or endangered species will be considered in the site-specific NEPA review of the license renewal application.

Concern Nmbr: AQE.005
Topic: Aquatic Ecology
Subtopic: Aquatic issues-Reactor systems impacts on rivers and ecoregions
Associated Comment Nmbr(s): W10.004 W10.006 054.056 056.011
Concern: A public interest group (Don't Waste U.S.) representative believes the GEIS fails to account for the fact that many facilities are part of collective "reactor systems" comprised of multiple plants, which cumulatively impact some of the nation's largest rivers. As an example, the group points to the Commonwealth Edison system around Chicago and the Tennessee Valley Authority (TVA), which impact the southern end of Lake Michigan and the Tennessee River, respectively. Additionally, the group believes that the GEIS should look more closely at reactor impacts on economically valuable fisheries, such as the lobster and oyster fisheries in Niantic Bay.

The DOI voiced this same concern regarding cumulative impacts.

Minnesota commented that two nuclear power plants in Minnesota (Prairie Island [PI] and Monticello) are located in environmentally sensitive areas on the Mississippi River that are already stressed by several factors, including dams, commercial navigation, heavy recreational boat traffic, and significant pollutant and silt loadings. The cumulative contribution of the PI and Monticello nuclear power plants to this ecosystem needs to be addressed. The commenter further states that the NRC must modify its proposal to ensure that the concerns of State and Federal agencies are adequately incorporated and addressed in the NRC's consideration of the applications to relicense these two plants.

Response: Cumulative impacts of multiple power plants are considered in Appendix F. For each impact covered in the GEIS, the cumulative impacts related to such issues have been considered. Effects on fish, including commercially harvested species, are considered in Chapter 4 and in the CWA permitting and approval actions.

The State commenter, although expressing concern about impacts of multiple uses of the Mississippi River in that region, did not identify any specific impacts caused by the two power plants mentioned that the NRC could assess. The NRC knows of no impacts other than those discussed elsewhere in the GEIS that are attributable to the PI or Monticello plants.

The NRC has addressed all public, State, and Federal comments submitted and has made changes to the GEIS as appropriate.

Concern Nmbr: AQE.006
Topic: Aquatic Ecology
Subtopic: Aquatic issues-impacts on aquatic systems
Associated Comment Nmbr(s): 010.006 031.005 043.002 056.004 087.023
Concern: The EPA questioned whether aquatic ecology impacts resulting from refurbishment activities may be different from those associated with initial plant construction or routine operation. Significant improvement in receiving water quality over the past 20 years and the resulting return of indigenous populations of in-stream biota may necessitate reassessment on a site-by-site basis of the aquatic ecology impacts resulting from refurbishment activities. Such considerations should include potential disturbances in water current patterns, increased stream and

sediment loadings of pollutants expected to be discharged, and alterations in thermal patterns within the water column (thermal plume residence, thermal barriers, cold shock). In light of this and the GEIS's statement that there has been measurable accumulation of toxic metals (copper) in sediments and other impacts (e.g., gas bubble disease (GBD), depressed dissolved oxygen), this issue needs to be changed to Category 3. Within the site-specific evaluation, sublethal impacts (depressed reproduction, increased predation, species density shifts) should be more adequately considered. (See Section 3.5, p. 3-3; p. 10-9.)

The DOI believes that despite the regulation of condenser cooling systems by the EPA or its designated State permitting agencies, entrainment, impingement, and thermal effluent issues should be addressed in site-specific NEPA documentation at the time of relicensing. The relicensing process must serve to identify impacts and needed mitigation associated with continued plant operation. Applicants for relicensing should consult with the appropriate State and Federal agencies regarding the identification and mitigation of concerns associated with plant water intakes and discharges. Conflicts about water use issues should be resolved by the utility and appropriate State and Federal agencies.

The NYSEO disagreed with the conclusion in the draft GEIS that aquatic ecology issues are of minor impact and, as Category 1 and 2 issues, do not require site-specific analysis during relicensing. The NYSEO indicated that impacts to aquatic ecology from cooling water withdrawal can be significant and continue to be a major concern. The NYSEO noted that biological monitoring has consistently demonstrated that impacts imposed on an aquatic ecosystem in producing electricity are directly related to the volume of water used, and provided data for the Hudson River to illustrate their concerns. The NYSEO argued that aquatic ecology impacts, such as entrainment and impingement of fish and shellfish, must be reviewed on a site-specific basis at the time of relicensing. Furthermore, the existence of an NPDES permit or accepted 316(a) or 316(b) demonstration should not be used as the defined bounds that allow for a generic conclusion to be reached in the GEIS.

Two public interest groups commented about impacts to marine environments. The first group, Neighbors United to End Nuclear Dumps (NU-END), alleged that there have been damaging effects to the marine blood worm population due to thermal changes in Montsweag Bay as a result of reactor discharge. The second group, the Florida Coalition for Safe Energy (FCSE), urged that each plant requesting relicensing be subject to an EIS which would consider the effects of cooling water discharges on marine life.

Response: In Chapter 2 and Appendix B of the GEIS, the NRC identified potential refurbishment activities that could occur at nuclear power plants in preparation for relicensing. The NRC concluded that refurbishment would not require site development activities involving land clearing, grading, excavation or construction as was required for initial construction. Refurbishment activities would generally involve mechanical and electrical work within the controlled area and may not necessitate any new buildings. Potentially, the most significant refurbishment or maintenance activities that may occur at some plants would be steam generator replacement and construction of facilities for onsite storage of spent fuel. NRC staff has performed environmental

assessments (EAs)[1] for both types of activities. These assessments demonstrate that the aquatic impacts of such refurbishment activities are small.

With regard to the specific surface water effects cited by the EPA, the plant modifications made during refurbishment are not expected to result in any significant change in plant operating characteristics. Such effects are not expected to occur where they are not already occurring. Neither are such effects expected to occur as a result of the refurbishment activities themselves.

With regard to the issue of sublethal impacts, see response to Concern Number AQE.011.

The DOI, NYSEO, and public interest group comments relate to aquatic impacts associated with current and future operation rather than to the impact of refurbishment. The commenters feel that impacts are occurring due to the withdrawal or discharge of cooling water at nuclear power plants, and all felt that the environmental review for license renewal should address this issue. The CWA, as amended, explicitly addresses regulatory control of impacts from the intake and discharge of cooling water. The NRC is aware that attainment of the goals of the CWA may necessitate more stringent effluent limitations or controls at certain facilities. The NRC will require that each applicant for relicensing possess a CWA Section 401 certification and that provisions of the Act be met.

With regard to the DOI's comment about water use conflicts, see response to Concern Number SWQ.004.

With regard to impacts to Hudson River fisheries, the NRC notes that the State of New York and the EPA evaluated the cumulative impacts of water use by all power producers, including fossil units and hydroelectric generating units in addition to the Indian Point plants, in determining the optimum control. On May 19, 1980, the EPA, the NYSDEC, the Hudson River utilities, and others entered into the Hudson River Cooling Tower Settlement Agreement for the control of the power plants' discharges to the Hudson River. On May 15, 1991, the agreement was renewed, as the Hudson River Settlement Agreement (see NRC Docket No. 50-286) between the NYSDEC and the Hudson River utilities. The NRC was not a party to the this Agreement although NRC had committed to accepting it as the mechanism for controlling the impacts at an acceptable level. That agreement, in the form of a consent order, is being reexamined by agencies responsible for implementing the CWA. The parties to the original settlement agreement concluded that aquatic life was adequately protected without further mitigation at the Indian Point site.

Where it is expected that a listed or proposed aquatic species or habitat may be impacted, the NRC would coordinate the review with the DOI and with the NPDES permitting authority to ensure that effluent limitations in the NPDES permit protect the listed species.

Regarding the NYSEO statement that Categories 1 and 2 do not require site-specific analysis for license renewal, it should be noted that definitions of the issue categories have been revised.

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[1] For example: NUREG-1011, *Final Environmental Impact Statement Related to Steam Generator Repair at Point Beach Nuclear Plant, Unit No. 1*, NRC, September, 1983; NRC, Docket No. 72-2, *Environmental Assessment Related to the Construction and Operation of the Surry Dry Cask Independent Spent Fuel Storage Installation*, NRC Office of Nuclear Material Safety and Safeguards, April 1885.

There are now only 2 issue categories, instead of the 3 in the proposed rule. All Category 2 issues require site-specific review.

Although NU-END expressed concern that the thermal discharge at Maine Yankee is impacting the blood worm fishery in Montsweag Bay, those agencies responsible for regulating the thermal discharge in accordance with the CWA did not indicate that such a problem exists. Attention to this concern on the part of the responsible permitting agencies should not await relicensing, but should be considered at the time of renewal of the NPDES permit.

Regarding the FCSE's suggestion for a site-specific evaluation of impacts to marine environments, the GEIS analysis has considered such impacts and has found that impacts on impingement of fish and shellfish, entrainment of fish and shellfish, and heat shock on fish and other aquatic organisms are Category 2 issues, which will require site-specific evaluations. Other impacts related to aquatic ecology, such as entrainment of phytoplankton and zooplankton, and cold shock, were found to be small for all plants, and are designated as Category 1.

Concern Nmbr: AQE.007
Topic: Aquatic Ecology
Subtopic: Contaminants in sediments or biota
Associated Comment Nmbr(s): 038.002 038.006 087.020 087.024
Concern: The EPA noted that the GEIS does not state that the copper discharge problem, corrected at the cited plant, is not also taking place at any other plants. The EPA also pointed out that the GEIS indicates that there has been very little study of metal levels in cooling ponds. Moreover, being a cumulative impact, the absence of impact over the past years of operation does not prove that accumulations will not reach damaging levels over the additional 20 years of operation. Absence of data does not necessarily indicate absence of impact.

The MDNR specifically suggested that the discharge of heavy metals by existing nuclear plants with once-through systems be designated as a Category 2 issue because discharge from copper-nickel condenser tubes may have long-term effects that will not be addressed through a Category 1 assignment.

Response: The NRC believes that copper discharge problems are not occurring at other plants. The corrosive waters that contributed to the leaching of copper at the cited plant fairly quickly impaired condenser performance, necessitating replacement of the copper-containing tubing with tubing of a more corrosion-resistant material. The unusual properties of the receiving water also contributed in the leached copper being in a toxic ionic state. Severe corrosion at other sites where similar ambient water quality conditions may exist would become known through condenser performance, if not through environmental observations.

There were also unique characteristics of the surface water body which contributed to the accumulation of copper at the cited plant. Section 4.2.1.2.4 stated that in most cases copper and other contaminants do not accumulate in the vicinity of the discharge, but are diluted or flushed from the area of the power plant by the large volumes of the receiving water.

Monitoring for heavy metals has been conducted in a few instances where potential accumulation could occur (e.g., cooling ponds with limited flushing rates). As noted in the GEIS, at those sites where metal accumulation was found to be a problem, the problem was recognized early during plant operation and was corrected by replacement of corrodible condenser tubes. The response of State and Federal regulatory and resource agencies consulted in preparation of the GEIS did not indicate a concern about accumulation of metals at other sites.

Section 4.4.2.2 cited a study designed to detect water quality and ecosystem impacts of power plant operation on 14 cooling impoundments. These 14 cooling impoundments were selected from a population of 135 steam-electric power plant cooling ponds across the United States as those most likely to provide "worst-case" conditions for identifying impacts from power plant operation. Selection was based on load ratio, i.e., impoundment surface area divided by rated plant generating capacity in MWe. The authors assumed that cooling impoundments with a low load ratio (relatively little dilution of power plant discharges) would be most likely to exhibit discharge-related water quality and ecosystem effects. Evaporation from completely enclosed ponds resulted in a gradual concentration of inorganic constituents over the years of power plant operation, but levels did not exceed those commonly tolerated by aquatic organisms. Trace metal concentrations were measured at a cooling impoundment in Texas with one of the lowest load ratios in the study. This impoundment is a completely enclosed system with high evaporative water losses and essentially no drainage, resulting in a situation which should lead to relatively high concentrations of water quality constituents. After 15 years of operation, monitoring data indicated that concentrations of some conservative parameters (e.g., hardness, chloride, and sulfate) had increased in the reservoir whereas others (e.g., silica and iron) had decreased. Trace metals did not appear to be accumulating in the impoundment, and concentrations of metals were too low to be toxic to aquatic organisms.

Because many cooling ponds have outlets, metals and other inorganic constituents are not concentrated indefinitely, but rather are flushed from the system continuously or at least periodically during power plant operation. Section 4.4.2.2 of the GEIS has been revised to reflect the fact that this study failed to find adverse accumulations of conservative water quality constituents in 14 "worst-case" examples of cooling impoundments at steam-electric power plants.

Concern Nmbr: AQE.008
Topic: Aquatic Ecology
Subtopic: Cold shock
Associated Comment Nmbr(s): 087.025
Concern: The EPA agrees that cold shock is most likely Category 1; however, mitigative measures employed should be more fully described to justify the designation.

Response: A description of mitigative measures that could be used to prevent cold shock has been added to Section 4.2.2.1.5 of the revised GEIS.

Concern Nmbr: AQE.009
Topic: Aquatic Ecology
Subtopic: Gas supersaturation
Associated Comment Nmbr(s): 087.027
Concern: The EPA observed that, according to the GEIS, GBD has been mitigated at the nuclear power plant (Pilgrim Nuclear Power Station) where large numbers of fish were affected. However, the GEIS does not indicate that GBD is not occurring at other plants; therefore, GBD should be considered Category 2. Moreover, the GEIS assertion that "plant modification associated with license renewal will not result in greater risk of GBD" does not justify its Category 1 classification if GBD is already a problem.

Response: The NRC believes that GBD is not occurring at other licensed nuclear plants. GBD is an indirect effect of discharging heated water and should be considered in the review of NPDES permit applications for steam-electric power plants. The evidence in the GEIS for absence of impacts is based on a thorough literature review, and on consultation with the regulatory and resource agencies that deal with these issues. All regions of the EPA, the U.S. Fish and Wildlife Service (FWS), and the National Marine Fisheries Service (NMFS), as well as 74 State water quality and resource agencies, were contacted about the aquatic impacts associated with nuclear power plants in their jurisdiction, specifically including the effects of thermal discharges (Appendix F). None of the agencies documented an occurrence of GBD at a licensed facility. No changes in the text are needed, and this issue remains Category 1.

Concern Nmbr: AQE.010
Topic: Aquatic Ecology
Subtopic: Low dissolved oxygen
Associated Comment Nmbr(s): 087.028
Concern: The EPA noted that, by definition, a "small" impact means that no mitigation or detailed investigation needs to be considered. But the issue of low dissolved oxygen in the discharge has been a concern and is being monitored at the Sequoyah Nuclear Plant (SNP) (GEIS, p. 4-20), which seems to contradict the definition of "small".

Response: The NRC believes that this problem is unique to the SNP. Waters low in dissolved oxygen are discharged from upstream multipurpose reservoirs operated by the TVA. The operation of the two nuclear plants has focused State and licensee attention on correcting the upstream problems. Recent changes in the release schedule of Watts Bar Dam appear to have reduced the stagnation of water near the SNP and alleviated concern about low dissolved oxygen effects. The GEIS has been revised to provide a better explanation of this situation.

Information obtained from consultation with regulatory and resource agencies, as well as review of literature on power plant impacts, indicates that low dissolved oxygen is not a widespread problem. Thus, there is sufficient basis to support the finding that this issue is Category 1.

Concern Nmbr: AQE.011
Topic: Aquatic Ecology
Subtopic: Aquatic organisms
Associated Comment Nmbr(s): 087.029
Concern: The EPA pointed out that the literature cited is too limited to adequately evaluate the sublethal effect of heat and cold shocks, or entrainment on aquatic organisms (i.e., losses from parasitism, predation, and disease). Also, the statement in Section 4.2.3.2 that "although significant localized effects of these stresses have occasionally been demonstrated, the populations' rapid regeneration times and biological compensatory mechanisms are apparently sufficient to preclude long-term or far-field impacts," is excessively presumptive and contradicts the statement under 4.2.3.1.10 that ". . . the best evidence for impacts (or lack of impacts) may come from long-term monitoring of fish populations."

Response: In preparing the GEIS, the NRC conducted a thorough review of the literature on the impacts of cooling water discharges on aquatic organisms, including sublethal effects. In its review, the NRC found no instances in which long-term monitoring of fish populations has revealed far-field, population-level effects of sublethal stresses on fish populations. As cited in draft Section 4.2.2.1.10, studies of disease and parasitism are reviewed in Langford (1983) and predation studies were examined in ORNL/TM-7801; these reviews do not point to any population-level effects from these indirect sources of mortality. Also, the comment did not identify any additional literature for consideration.

In addition to the literature review, the NRC consulted with the regulatory and resource agencies that deal with these issues. All regions of the EPA, the FWS, and the NMFS, as well as 74 State water quality and resource agencies, were contacted about the aquatic impacts associated with nuclear power plants in their jurisdiction, specifically including the effects of cooling water intakes and discharges (Appendix F). Consultations with the agencies did not reveal concerns about this issue for the power plants under consideration in this document. NRC staff knows of no evidence that indicates that disease, parasitism, or predation resulting from sublethal stresses associated with nuclear power plants has caused significant population-level impacts. No changes in the text or category, in this regard, have been made.

With regard to the statement in draft Section 4.2.3.2, the GEIS has been modified to remove the presumptive language about the possible reasons for the observed lack of long-term or far-field effects (see Section 4.2.2.2 of the revised GEIS).

Concern Nmbr: AQE.012
Topic: Aquatic Ecology
Subtopic: Entrainment/impingement
Associated Comment Nmbr(s): 087.030 087.031 087.032
Concern: The EPA noted that while Section 316(b) of the CWA establishes available technology for impingement and entrainment mitigation, the process of refurbishment for extended operation substantively changes the conditions of operation under which these determinations were made. It is appropriate that impingement and entrainment be discussed in the GEIS and considered as part of the relicensing process. This same argument also holds for Section 316(a) thermal effluent

discharge limitations, which should also be discussed in the GEIS and considered as part of the relicensing process.

Response: The NRC does not agree that the process of refurbishment for extended operation substantially changes the conditions of operation under which the 316(a) and 316(b) determinations were made. As discussed in Chapter 2 and Appendix B of the GEIS, the modifications, repairs, and replacements undertaken at each plant would not entail changes to the overall design of the plant. Therefore, basic plant operational characteristics, such as thermal performance, power output, and fuel utilization, are not expected to change. However, if substantive changes were necessary, the NRC believes that the Section 316 issues could and would be examined anew by the authorized agency. To ensure that such changes, if necessary, come to the attention of the authorized agency in a timely manner, the NRC will require that an applicant for license renewal identify substantive changes in their application to the NRC. The NRC will accept the findings of the NPDES permitting authority and the Section 401-certifying authority regarding the adequacy of mitigation for entrainment and impingement, and for thermal discharge impacts.

During the operating life of a plant, in accordance with 10 CFR 50.59, a licensee is permitted to make changes to the design or operation of the cooling water system without prior NRC approval if such changes do not involve a significant hazards consideration, do not require a change in technical specifications, or do not involve an unreviewed safety question (USQ). Such changes may be required by the NPDES permitting agency. In all cases they are subject to the controls of the NPDES permit. From time to time during the life of a nuclear plant, there may be cause for the NPDES-permitting agency to reexamine decisions made under the CWA, for example due to revision of estimated allowable heat loads under CWA Section 303(d)(D)(2) or because the operator of a nuclear power plant may propose to modify the design or operation of the condenser cooling water system. It is the NRC's expectation that any such change will be subject to the requirements of the CWA, so that any limitations necessary to achieve the objectives of this Act would be included in the NPDES permit.

Concern Nmbr: AQE.013
Topic: Aquatic Ecology
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 087.033
Concern: The EPA noted that beyond heat and cold shock, the stress of additional heat burden on organisms at the extreme ends of their temperature ranges should be addressed.

Response: Draft Section 4.2.3.1.6 has been retitled "Effects on Movements and Distribution of Aquatic Organisms." This is now Section 4.2.2.1.6 in the revised GEIS. A discussion of heat burden on organisms at the ends of their temperature ranges has been added. The consideration of impacts to organisms at the limits of their temperature ranges did not alter the conclusion that this is a Category 1 issue.

Concern Nmbr: AQE.014
Topic: Aquatic Ecology
Subtopic: Entrainment/impingement
Associated Comment Nmbr(s): 075.007
Concern: The PSCW noted that there is no mention of a possible need to change the design of the water intake structure to one causing less impingement than the original design, or to a design that reduces problems from zebra mussels.

Response: The NRC does not believe that refurbishment and continued operation authorized by relicensing will necessitate any change in cooling water usage. The NRC will defer to the agencies responsible for the issuance of permits and approvals under the CWA to determine the appropriate mitigative action to protect the aquatic environment from impacts. Changes in required mitigative action may occur in conjunction with any periodic renewal of the NPDES permit. Since license renewal will not result in a change in water use, it is not likely that renewal will necessitate any different mitigative action.

The NRC is not aware of any change made by a licensee in the design of an intake structure for the purpose of reducing problems from zebra mussels. Control of problems caused by biofouling organisms, including zebra mussels, is the responsibility of the licensees. It is unlikely that correction of a biofouling problem would await license renewal. Any action to control biofouling would have to be consistent with regulatory constraints. Regulations implementing the CWA would provide opportunity for review of any change to a discharge or to the intake structure.

Concern Nmbr: AQE.015
Topic: Aquatic Ecology
Subtopic: Chemical effects
Associated Comment Nmbr(s): 075.008
Concern: The PSCW noted that there should not be emissions of phosphates from Wisconsin nuclear power plants because phosphate detergents are banned in Wisconsin.

Response: Any restrictions on chemical discharges from power plants are regulated by existing NPDES/SPDES permits. The NRC expects all licensees to meet the terms of such permits and obey all relevant State laws.

Concern Nmbr: AQE.016
Topic: Aquatic Ecology
Subtopic: Ecosystems
Associated Comment Nmbr(s): 086.003 086.004
Concern: A public interest group (Trout Unlimited) is concerned that the short-term and long-term effects of the operation of a facility's discharges and withdrawals on a river's ecosystem and on migratory movements would not be addressed if a generic rule is adopted. In relation to the ecosystem, the effects of thermal and chemical discharges on Atlantic salmon eggs, fry, parr and smolt, and native and stocked trout populations may not be addressed. With regard to migratory

movements, the effect of water discharges and withdrawals on migratory movements of Atlantic salmon adults and smolts may not be addressed.

Response: The GEIS considered river ecosystems and impacts on migratory movements (see Section 4.2.2.1.6 of the revised GEIS). It specifically considered thermal and chemical discharge effects. No impact to Atlantic salmon or to stocked trout populations at an operating facility was identified through the literature review or the survey of State and Federal fishery experts.

Concern Nmbr: AQE.017
Topic: Aquatic Ecology
Subtopic: Water treatment
Associated Comment Nmbr(s): 038.004 038.007 038.008
Concern: The MDNR is concerned with the GEIS conclusion that facilities with approved 316(a) demonstrations and 316(b) reports do not have to address aquatic impacts, with the exception of threatened and endangered species. It pointed out that over half of the 74 nuclear facilities listed in Table 2.1 were constructed before 1980 and hence their 316(a) and 316(b) determinations are out of date. Since impact assessment methodologies have improved substantially since that time period, and many impacts considered adequate at that time may be considered inadequate today, the agency questioned how the NRC was going to ensure that balanced, indigenous populations will be protected and that existing plant technology will be used. The MDNR would like confirmation that the GEIS conclusion requiring those facilities without 316(b) evaluations to evaluate the impacts of entrainment and impingement of fish and shellfish in their license renewal application also would apply to those facilities for which the BAT determinations have not been addressed. In addition, the agency pointed out that the ANO and McGuire plants appear not to have BAT determinations. It asked whether these facilities are classified as having "unresolved" 316(b) issues and how they are treated in the GEIS.

Response: The 316(a) and (b) determinations are made implicitly at the time of each NPDES permit renewal. The 316(a) "variance" from State water temperature standards must be renewed every 5 years, and licensees must provide evidence to the permitting agency as to why the variance is still appropriate (Section 4.2.1.1 of the revised GEIS). Although 316(b) determinations are not usually periodically reconsidered, a determination by the regulatory agency under CWA Section 316(b) is not permanently binding. Where circumstances have changed, a full 316(b) demonstration could again be required by the agency responsible for doing so under the CWA. It is not the responsibility of the NRC to reexamine these issues under NEPA. In fact, the NRC is effectively barred from doing so by Section 511(c) of the CWA. The NRC will accept the applicable 316(a) and (b) determinations as determinations by the responsible agency that the residual aquatic impacts are acceptable. Where there is no valid determination, the licensee will be required to establish the magnitude of the aquatic impact by other means.

Concern Nmbr: AQE.018
Topic: Aquatic Ecology
Subtopic: Aquatic issues-impacts on fisheries
Associated Comment Nmbr(s): 054.059
Concern: The State of Minnesota noted that the extent to which thermal discharges from the PI plant affect winter fishery needs to be further evaluated from both a biological and a recreational/sociological standpoint. Cumulative impact analysis needs to be done on larval fish mortality in the Mississippi River between St. Cloud and Coon Rapids. The Monticello plant, the SHERCO plant, and hydroelectric facilities impact large volumes of Mississippi River water in this area. Larval and juvenile fish entrainment or impingement are ongoing concerns for resource managers and are tied to water withdrawal. Thus, alternative cooling system designs for the Monticello plant require adequate analysis, which would be unavailable under the proposed rule and GEIS.

Response: Regulation of these impacts is the responsibility of the agency charged with implementation of applicable provisions of the CWA. If such impacts warrant corrective action, that action need not, and probably should not, await relicensing to be examined by the responsible agency. The cooling system impacts of the PI and Monticello Nuclear Generating Plants to resources of the Mississippi River are examined by the Minnesota Pollution Control Agency (MPCA) as part of periodic NPDES permit renewal, and can be mitigated if necessary. In fact, initial problems with entrainment, impingement, and cold shock at Prairie Island were mitigated by redesign and relocation of the intake and discharge structures and by operational changes; extensive biological monitoring indicates that impingement and entrainment losses are presently insignificant (Patricia A. Bailey, MPCA, letter to G.F. Cada, July 3, 1990). The CWA Section 316(a) demonstration was partially responsible for the 1980 modification of the Monticello discharge canal to reduce cold shock mortalities. Thus, it appears that the processes established under the CWA are effective in addressing such impacts.

Concern Nmbr: AQE.019
Topic: Aquatic Ecology
Subtopic: Cooling water issue
Associated Comment Nmbr(s): 054.060
Concern: The State of Minnesota noted that a comprehensive analysis of the cooling water issue is needed to determine the optimum design and operation of a plant's cooling towers. Such an analysis should include consideration of design modifications that would improve power generation efficiency while reducing the rejected heat in the river water cooling system. At PI, for example, warm weather operation of the cooling towers has resulted in colonization of the system by a parasitic amoeba, which presents safety concerns for plant personnel. To address this, the NSP has given PI permission to chlorinate the system. However, this results in considerable mortality of fish and other organisms within the recirculation canal. The immediate and long-term impacts of such actions on the aquatic ecosystems must be addressed.

Response: Regulation of these impacts is the responsibility of the agency charged with implementation of applicable provisions of the CWA. If such impacts warrant corrective action, that action need not, and probably should not, await relicensing to be examined by the responsible agency.

It should also be noted that the issue of heat shock on fish and other aquatic organisms has been found to be Category 2. This issue will be reviewed for each plant applying for license renewal. The review will include consideration of measures to mitigate the impact.

Concern Nmbr: AQE.020
Topic: Aquatic Ecology
Subtopic: Input on specific sites
Associated Comment Nmbr(s): 010.007 010.008
Concern: A public interest group (NU-END) was concerned about the lack of site-specific consideration of aquatic ecology impacts from Maine Yankee power plant discharges. The group cited past experience such as fecal pollution of Montsweag Bay and claims of increased cancer and leukemia deaths to residents living nearby.

Response: The site-specific effects of cooling water and sanitary wastewater discharges from the Maine Yankee Atomic Power Plant are regulated by the Maine Department of Environmental Protection through the periodic issuance of NPDES permits. Discharge standards and monitoring requirements specified in the NPDES permit would take into account potential impacts to water quality and aquatic resources, as well as other sources of pollution to the waters of the Gulf of Maine.

C-3. Topic: Air Quality (ARQ)

Air Quality (ARQ)

Concern Nmbr: ARQ.001
Topic: Air Quality
Subtopic: Categorization of issues
Associated Comment Nmbr(s): 087.047
Concern: The EPA commented that a nuclear power plant may not be in conformance with the requirements of the CAA if relicensing causes or contributes to any new, or increases the frequency or severity of any existing violation. The GEIS should discuss these issues. Furthermore, air quality should be classified as Category 2 and applicants in nonattainment areas undertaking relicensing should prepare supplemental environmental documentation, which should specifically discuss project conformity with the requirements of the CAA, as amended.

Response: The NRC agrees. The impact of refurbishment activities on air quality is now designated Category 2 (see Table 9-1 of the revised GEIS). The GEIS has been revised to acknowledge the need to review this issue on a site-specific basis. An examination will be made of whether direct and indirect air emissions from refurbishment activities would exceed established threshold emission levels for critieria pollutants in sites located in nonattainment and maintenance areas (as defined in the EPA's regulations). If the air emissions are expected to exceed any of the threshold levels, then, as part of its site-specific NEPA review, the NRC will prepare a written conformity analysis with respect to compliance with the CAA requirements.

C-4. Topic: Decommissioning (DEC)

Decommissioning (DEC)

Concern Nmbr: DEC.001
Topic: Decommissioning
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W07.001 W07.009 W07.015 093.010
Concern: Representatives from the Oregon Department of Energy, the Maine State Planning Office (MSPO) and SC&A (an engineering consulting company), and the NECNP (a public interest group) expressed concern over the finding that all decommissioning issues are to be generically treated as Category 1. Oregon indicated that this finding would preclude the impacts of retrofitting expected to be necessary for many plants, such as bringing some plants up to a more restrictive earthquake standard in the Pacific Northwest. Maine indicated that a Category 1 determination was inappropriate since there is tremendous public concern (in Maine) over the disposal of decommissioning waste. NECNP noted that the technological problems of accomplishing decommissioning safely have yet to be resolved since no commercial reactor of 500–1,000 MW has been decommissioned yet. Finally, the SC&A representative identified a possible inconsistency wherein waste disposal is a Category 1 issue in decommissioning, but is a Category 2 issue in the solid waste management section of the GEIS.

Response: Chapter 7 was not intended to perform a review of the environmental impacts of decommissioning. This is accomplished in NUREG-0586, *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities*, and is supplemented by a site-specific environmental review at the termination of every nuclear plant's operating license. The purpose of Chapter 7 of the GEIS was to determine the differences between decommissioning after 40 years of operation and decommissioning after 20 years of additional operation. The review in Chapter 7 concluded that the effects of decommissioning after a 20-year license renewal are not expected to differ from those of decommissioning at the end of 40 years of operation.

The commenters' concerns regarding bringing plants up to earthquake standards are common to decommissioning after 40 years of operation and decommissioning after a license renewal period. With regard to decommissioning waste, the GEIS shows that license renewal would not appreciably increase the quantity or classification of LLW generated by decommissioning.

Concern Nmbr: DEC.002
Topic: Decommissioning
Subtopic: Non-radiological decommissioning
Associated Comment Nmbr(s): W07.004 W07.007 087.107
Concern: The EPA, and representatives from the California Energy Commission (CEC) and from Shaw, Pittman, Potts & Trowbridge, a law firm representing the nuclear industry, requested further clarification on the NRC's position regarding nonradiological decommissioning requirements. The EPA believes that the total impacts associated with returning the site to green field conditions need to be addressed. The lawyer indicated that the stated consideration of only the radiological aspects of decommissioning in the GEIS is inconsistent with what the NRC has done in the past.

The CEC representative indicated that the return of the site to pre-construction conditions is more in line with the expectations of the public.

Response: The NRC defines decommissioning as the safe removal of a nuclear facility from service, and the reduction of residual contamination to a level that permits release of the property for unrestricted use and termination of the license (10 CFR 50.82). Therefore, the question of restoring the land to a "green field" condition, which would require additional nonradiological demolition and site restoration activities, is beyond the current scope of the decommissioning requirements.

Moreover, the issue of returning the site to preconstruction conditions would be an issue common to decommissioning after 40 years of operation and to decommissioning after a 20-year renewal. Thus, this issue is also beyond the scope of consideration in the GEIS.

Concern Nmbr: DEC.003
Topic: Decommissioning
Subtopic: Radiation dose
Associated Comment Nmbr(s): W07.005 032.021
Concern: The NSP and an industry lawyer from Shaw, Pittman, Potts & Trowbridge recommended that the current decommissioning efforts of the Pathfinder reactor in South Dakota be incorporated into Table 7.1 of the GEIS.

Response: The Pathfinder reactor decommissioning effort is included in Table 7.1.

Concern Nmbr: DEC.004
Topic: Decommissioning
Subtopic: Waste management
Associated Comment Nmbr(s): W07.006 W07.011 W07.012 W07.013 W07.016 096.014
Concern: Representatives from the Pennsylvania Department of Environmental Resources (PDER), the Illinois Department of Nuclear Safety, and the Philadelphia Department of Environmental Resources, and the State of New Jersey indicated that the GEIS should provide more depth in terms of the derivation of the numbers used in the decommissioning analysis, and identified a number of areas in which the LLW portion of the analysis ought to be expanded in scope. Specifically, (1) the analysis on LLW disposal costs should reflect the wide range of variability in disposal costs from one compact to another; (2) the LLW volumes that occur from 30 to 50 years of SAFSTOR should be reexamined based on the possibility of not having a below regulatory concern (BRC) policy in place; (3) the assumption that an additional 20 years of irradiation will not cause the generation of any additional Class C or greater than Class C (GTCC) waste seems unfounded; (4) the waste volume numbers do not appear to take into account the advanced decontamination processes that are currently in use; (5) the economic impacts of having to expand existing waste storage facilities, site new facilities, or extend the period of SAFSTOR due to waste disposal limitations should be considered; and (6) NRC staff should be responsible for developing a liquid waste estimate for decommissioning (p. 7-17, line 21) for inclusion in the GEIS.

Response:

1. The issue of decommissioning costs is relevant only to the extent that the NRC requires, under 10 CFR 50.73(e), that licensees provide assurance that adequate funds will be available to decommission their facilities. Since the NRC concluded in Chapter 7 that renewal will have no appreciable affect on expected decommissioning activities, delaying decommissioning activities will result in significant discounted financial savings, assuming a positive real discount rate.

2. The NRC does not have a BRC policy, but does have criteria for the release of nuclear facilities to unrestricted access following decommissioning. The NRC/AEC has terminated licenses for 62 research reactors that have been decommissioned and met requirements for unrestricted access. Current release criteria for reactors and other nuclear facilities is specified by the NRC in SECY-92-106, dated April 6, 1992. For reactor facilities, SECY-92-106 specifies the following: (1) using Regulatory Guide 1.86 (June 1974) for surface contamination; (2) establishing an annual equivalent dose limit of 10 mrem per year from gamma-emitting radionuclides; and (3) keeping residual contamination as low as reasonably achievable (ALARA).

   A proposed rule dated August 22, 1994 (10 CFR Part 20, "Radiological Criteria for Decommissioning," 59 FR 43228) intends to codify radiological criteria for unrestricted release of reactors and other nuclear facilities and for termination of a facility license following decommissioning. The draft GEIS for that proposed rule includes analyses of a range of radiological criteria and confirms the earlier conclusions that waste volumes from decommissioning of reactors are not sensitive to the residual radiological criteria likely to be selected. The waste volumes used in the GEIS are based on the Regulatory Guide 1.86 criteria. Waste volumes are not likely to increase as a result of the new criteria, and the use of delayed dismantling (the SAFSTOR alternative) can reduce the waste volume significantly. In addition, improvements in waste compaction, volume reduction, and recycling to nuclear uses will likely decrease the total waste volumes in the future.

   In any case, Chapter 7 shows that the volumes of LLW generated by decommissioning would not be affected by an additional 20 years of plant operation.

3. NRC staff considered the possibility that 20 additional years of operation might advance wastes to higher classes. As noted in Section 7.3.2, concentrations of long half-life nuclides, such as ^{59}Ni and ^{94}Nb, determine whether wastes are Class C or GTCC. While concentrations of these nuclides would increase by no more than 50 percent, the concentration differences between waste classes are factors of 10 to 100. Therefore, few components would be advanced into or beyond Class C.

4. The comment is correct, in that advanced volume reduction and decontamination techniques were not assumed for the decommissioning analysis. This has the conservative effect of over-estimating waste volumes that would result from decommissioning.

5. Additional waste disposal facilities may be needed for 20 additional years of operation. However, these waste volumes result from operations. Decommissioning waste volumes would be essentially unchanged by license renewal. The NRC will not consider the economic

costs of expanding waste storage facilities in its license renewal decision. The economic costs of a particular generating source (including the economics of expanding waste storage facilities) are factors for the State and utility officials to consider when deciding what energy alternatives meet their needs. The NRC will consider the environmental impacts from license renewal and will not attempt to influence State and utility decisions on economic grounds.

Chapter 7 shows that renewal will have no appreciable affect on expected decommissioning activities. Therefore, delaying decommissioning activities will result in significant discounted financial savings, assuming a positive real discount rate.

6. As described in Section 7.2.5.2 of the revised GEIS, filtration and ion-exchange methods will continue to be used to decontaminate these liquids until they are disposed, with the radionuclides removed through these processes accounted for as solid waste. For nuclear power plants that are currently preparing for decommissioning, liquid waste estimates have been developed by the utilities as part of their decommissioning plans. For both the Yankee Rowe and Rancho Seco plants, radionuclide concentrations in the liquid waste expected to be disposed of (such as cooling and fuel-storage pool waters) are anticipated to be less than 1 percent of the waste concentrations during normal operations. This includes radionuclides such as ^{60}Co, ^{134}Cs, and ^{137}Cs. For tritium, which cannot be removed by these methods, liquid waste releases are not expected to exceed the normal operating period discharge rates, as described in the revised GEIS in Section 7.2.5.2. The conclusion of Chapter 7 is that an additional 20 years of operation will not increase water quality impacts of decommissioning, because radioactivity will not increase appreciably due to 20 additional years of operation.

Concern Nmbr: DEC.005
Topic: Decommissioning
Subtopic: Waste management
Associated Comment Nmbr(s): W07.008
Concern: An MSPO representative expressed concern that the issue of plant-specific license renewal should not be addressed without first going to the individual States who are responsible for the management of the LLW to make sure that the waste from decommissioning can be adequately dealt with in that time period.

Response: NRC staff agrees with the commenter that States need to be involved with the LLW management issues associated with the decommissioning of their nuclear plants. However, the NRC has determined that the waste associated with decommissioning after the initial 40 years of operation will not appreciably differ from the waste generated from decommissioning after a 20-year renewal.

Concern Nmbr: DEC.006
Topic: Decommissioning
Subtopic: Documentation
Associated Comment Nmbr(s): W07.014
Concern: An EPA representative expressed difficulty in understanding the organizational approach to the decommissioning section of the GEIS with respect to the rest of the document. Individual aspects of the refurbishment scenario (such as waste management or cost impacts) are addressed in separate chapters of the document; however, for decommissioning, all associated topics are discussed in the one chapter. He recommends that the approach for this section be explained better in the beginning of the chapter to aid the reader.

Response: The second and third paragraphs of Section 7.1 of the revised GEIS describe the purpose and scope of the chapter on decommissioning. These paragraphs are intended to aid the reader in understanding the organizational approach to the decommissioning chapter of the GEIS.

Concern Nmbr: DEC.007
Topic: Decommissioning
Subtopic: Waste management
Associated Comment Nmbr(s): 035.017 087.113
Concern: The PDER asked what would be the recommended disposal procedures for reactors, steam generators, pressurizers, pressure vessels, and other large units. It is of the opinion that the technology used to decommission nuclear plants would improve between now and the actual date of dismantlement. This technology may, in turn, decrease volumes of LLW and alter current decommissioning procedures. With regard to the decontamination of metals, the EPA noted that at the top of page 7-13, the GEIS states that activated metal cannot be decontaminated. The EPA pointed out that melt-refining and electro-refining can be used to decontaminate and recycle activated metals. If such processes are found to be cost-effective, the costs and impacts of decommissioning could be sharply reduced, especially since waste disposal costs are a major contributor to decontamination and decommissioning (D&D) costs (see Table 7.10 on p. 7-26).

Response: The NRC expects that major vessel components will be cut and disposed of in a cask for shipment to a burial site unless the waste is classified as GTCC, which will await disposition by the DOE. Most of the cutting will be perfomed underwater by plasma arc cutting of components into segmented sections that will be packaged into burial or storage casks. The utility will have to determine at the time of decommissioning if it is cost-effective to melt-refine or electro-refine activated metals to segregate them as opposed to disposing of them (the wastes) intact. Recent experience is that the melt-refining process is worthwhile for dealing with surface or subsurface ingrained contamination, where the slag from the process tends to entrain the bulk of the contamination. For activated metals, where the radionuclides are dispersed throughout the metal, the process is not applicable.

Concern Nmbr: DEC.008
Topic: Decommissioning
Subtopic: Taxes
Associated Comment Nmbr(s): 075.019
Concern: The PSCW believes that if taxes are based on the book value of the power plant, taxes near the end of plant life and the effect of decommissioning on tax payments should be small.

Response: This comment apparently refers to *net* book value, which is the amount invested in the nuclear plant minus depreciation. If a plant's taxable value were assessed based on net book value and if no significant repairs, replacements, or improvements had been made since original construction, then the PSCW's statement about the impact magnitude would be correct.

Section 9.3.7 (Socioeconomics) of the draft GEIS stated that "for those jurisdictions where plant-related tax payments account for a large portion of total revenues, plant shutdowns would be expected to have a significant negative impact . . . ." While technically correct under any circumstances, this statement could be misleading if tax payments typically are based on the net book value of an unimproved plant because then it would be rare for plant-related payments to be substantial toward the end of the operating period. This passage has been clarified to read, "Some jurisdictions may obtain several million dollars in annual tax revenues from plants. If these revenues comprise a substantial portion of the jurisdiction's revenues, the jurisdiction could have difficulty supporting its preclosure level of public services." (See Section 8.3.7 of revised GEIS.) In fact, it is common for the assessed value of a nuclear power plant to remain high over time, as explained below.

Typically, additional capital investment is made in a nuclear plant during its operating life, and this contributes to its book value, counteracting—at least in part—the effects of depreciation. Where substantial improvements are made, even the depreciated value of a plant can be substantial. But there is an even more important reason why tax payments to communities are not expected to substantially erode over the life of the plant: namely, that the assessed value of a plant generally is not determined solely by its net book value. In some instances, the value of a plant is taken from the *gross* book value, which is the amount invested in plant construction and subsequent improvements without accounting for depreciation. In other cases, the value of a plant is depreciated over time, but it is the replacement value (generally much more than book value) that is the basis for this calculation. Some States and locales establish a floor level (e.g., 40 percent of replacement cost) below which the assessed value cannot fall. In addition to these *cost* approaches, plant value also can be assessed using (1) an *income* approach, which looks at a facility's income-producing capability; or (2) a *market* approach, which establishes value based on the selling price of comparable facilities. Toward the end of a plant's operating life, all of these assessment methods can be expected to result in a substantially higher plant valuation than would the net book value approach. Tables C.9 and C.10 show that the actual assessed value of operating nuclear plants has tended to increase over time.

Concern Nmbr: DEC.009
Topic: Decommissioning
Subtopic: D&D rule
Associated Comment Nmbr(s): 087.109
Concern: The EPA noted that GEIS Chapter 7 D&D is based on NUREG-0586, which is the EIS in support of the D&D rulemaking and which generically characterizes D&D impacts in a realistic manner. The EPA believes each D&D operation will be supported by a site-specific EIS addressing all issues. However, the D&D rulemaking was not designed to bound impacts. Therefore, it is questionable whether NUREG-0586 can be used to categorically exclude the impacts, unless it is demonstrated in the GEIS that NUREG-0586 bounds the impacts for all plants.

Response: NUREG-0586 may not bound the impacts of decommissioning; however the analysis in Chapter 7 of the GEIS shows that extending the operational period from 40 years to 60 years will have very little effect on the impacts of decommissioning. It is the fact that these impacts do not change that leads to the chapter's conclusion, not whether the impacts of decommissioning a particular plant are bounded by the impacts reported in NUREG-0586. The impacts of decommissioning will be essentially the same, whether the plants operate for 40 or 60 years.

Concern Nmbr: DEC.010
Topic: Decommissioning
Subtopic: Waste management
Associated Comment Nmbr(s): 087.111
Concern: The EPA pointed out that pressurized-water reactor (PWR) turbines will be slightly contaminated at the end of plant life and that primary to secondary leakage is a normal and expected part of plant operations. This is in disagreement with page 7-4, which states that because the PWR turbines are not part of the primary loop, they normally are not contaminated.

Response: The GEIS text has been revised to acknowledge the contamination of PWR turbines, which is less than that for an operating boiling-water reactor (BWR), where the turbine is part of the primary loop. Decommissioning of the secondary system of a PWR will depend on the degree of contamination, and will be accounted for in the submittal of the decommissioning plan.

Concern Nmbr: DEC.011
Topic: Decommissioning
Subtopic: Radiation dose
Associated Comment Nmbr(s): 087.110
Concern: The EPA pointed out that the statement on GEIS page 7-17 that ". . . atmospheric releases for decommissioning are less than 100 mCi, whereas normal operations average about 3,000 Ci/yr" is somewhat misleading since the releases from normal operations are relatively short-lived noble gases, while D&D emissions are longer lived particulate radionuclides that have much higher dose conversion factors.

Response: The NRC agrees with this comment. As suggested, some radioactive particles released during decontamination may have a higher dose conversion factor than the noble gases

released during normal operation; however, Table 7.6 shows that only a negligible part of the dose to the public would result from decontamination activities.

Concern Nmbr: DEC.012
Topic: Decommissioning
Subtopic: Radiation dose
Associated Comment Nmbr(s): 038.049 096.013
Concern: The State of New Jersey commented that the statement on GEIS page 7-16, line 10, that "because ^{63}Ni is a [beta] emitter, it contributes nothing to the dose to workers or the public" is incorrect. Significant amounts of airborne contamination will likely be generated during decommissioning as plant components and structures are dismantled. New Jersey indicated that this airborne contamination will pose a significant internal exposure hazard to plant workers. The MDNR also noted this error in the GEIS. It added that 10 CFR Part 20 reduced the eye dose limit to 50 percent due to beta radiation.

Response: The NRC agrees that beta radiation has the potential to contribute to internal dose to workers. However, it is not expected that decommissioning activities associated with ^{63}Ni will pose a "significant internal exposure hazard" to plant workers. The nuclear industry has accumulated extensive experience through plant maintenance and testing in environments containing beta radiation. Industry procedures for protecting workers and controlling contamination should be sufficient to preclude beta emissions of ^{63}Ni from contributing significantly to worker or public dose.

With regard to the external dose to the eye, the NRC decision in 10 CFR Part 20 to lower the eye dose limit from 0.3 Sieverts (30 rem) to 0.15 Sieverts (15 rem) was based on preventing vision deterioration as a result of lifetime exposure. In most situations, the deep-dose equivalent and the shallow-dose equivalent limits to the skin should ensure that the eye dose limit is also met. Additionally, the 66 keV beta rays associated with ^{63}Ni have very limited penetrability and, therefore, pose very limited external radiation hazard.

Concern Nmbr: DEC.013
Topic: Decommissioning
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.026 096.015
Concern: The State of New Jersey commented that the statement in the GEIS on page 7-25, lines 24–25, that "in general, the activities and costs associated with decommissioning are well understood" is inconsistent with a statement on page 7-27, line 4, that "total decommissioning costs are uncertain."

A DOE representative noted that the decommissioning costs used in the analysis are actually underestimates (i.e., unescalated costs). The details of those estimates, as well as the assumptions behind them, should be provided in the report.

Response: The costs of decommissioning are uncertain primarily because of the uncertainty in LLW disposal costs. The sentence in question has been changed to read: "In general, the nature of the activities and the elements of the costs associated with decommissioning are well understood . . . ."

The details of the cost estimates are summarized in Table 7.8, with additional details available in the source documents referenced therein.

Concern Nmbr: DEC.014
Topic: Decommissioning
Subtopic: Environmental impact
Associated Comment Nmbr(s): 087.108
Concern: The EPA believes that, due to the lack of a residual radioactivity rule, there is some question whether the generic impacts provided in NUREG-0586, especially costs, are subject to change once the NRC or the EPA issues such a rule. This matter should be discussed in the GEIS.

Response: Current criteria exist and a proposed rule dated August 22, 1994 (10 CFR Part 20, "Radiological Criteria for Decommissioning", 59 FR 43228) specifies radiological criteria for unrestricted release of reactors and other nuclear facilities, and for termination of a facility license following decommissioning. NUREG-1496, the draft GEIS for the proposed rule on radiological criteria included analyses of a range of radiological release criteria and confirmed the earlier conclusions that waste volumes from decommissioning of reactors are not sensitive to the residual radiological criteria within the range likely to be selected. This range included residual dose levels comparable to the radiological criteria currently being used for reactor decommissioning. Based on the insensitivity of the waste volume from reactor decommissioning to the radiological criteria we continue to believe, as concluded in the decommissioning section of the GEIS, that the contribution to environmental impacts of decommissioning from license renewal are small and we further conclude that these impacts are not expected to change significantly as a result of the ongoing rulemaking.

C-5. Topic: Generic Environmental Impact Statement (GIS)

Generic Environmental Impact Statement (GIS)

Concern Nmbr: GIS.001
Topic: Generic Environmental Impact Statement
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W03.001 087.011
Concern: The EPA disagreed with the GEIS terminology in relation to the magnitude of an impact versus the categorization of an impact. The EPA pointed out that an issue is designated as Category 1 because its impact has been generically quantified and it applies to all plants whether or not the impact is small. The EPA also noted that the GEIS uses the concept of a Category 1 and magnitude of the impact interchangeably in many instances. Similarly, a Virginia Power representative did not see any fundamental difference between Category 2 and Category 3 in terms of how a licensee needs to respond for license renewal. He believes that all issues in the GEIS could be characterized as either Category 1 or Category 2, and therefore the two Category 3 issues should be eliminated.

Response: To reduce potential confusion over the definitions, use of categories, and treatment of mitigation within the context of the categorization scheme, the NRC revised the definitions to eliminate any ambiguity regarding how they are used. First, the level of significance of the effects of an environmental issue was defined as small, moderate, or large. The revised definitions differ slightly from those in the proposed rule and draft GEIS. They are given in Table B-1, Appendix B to 10 CFR Part 51.

Concern Nmbr: GIS.002
Topic: Generic Environmental Impact Statement
Subtopic: Nuclear plant's status-documentation
Associated Comment Nmbr(s): W08.023
Concern: A DOE representative suggested the need for a place in the document that indicated the status of all the nuclear plants currently under construction, operating, or indefinitely deferred.

Response: The information concerning the expiration dates of current licenses is available in the NRC's Information Digest and will not be repeated in this GEIS.

Concern Nmbr: GIS.003
Topic: Generic Environmental Impact Statement
Subtopic: Substantiation of conclusions-documentation
Associated Comment Nmbr(s): W12.042 096.002
Concern: A commenter for Gannett Fleming, Inc. recommended that all the literature used in the GEIS effort be cited. He found that sometimes the conclusions reached in Chapter 4 of the GEIS were not substantiated and it was difficult to determine whether the conclusions were valid since all the literature was not cited in all cases. Similarly, letters relating to aquatic ecology which were sent out to nuclear power plants or to companies which run those plants and the responses to those letters should be included in the appendix of the EIS for reference purposes.

A New Jersey Department of Environmental Protection and Energy representative commented that the approach used by the NRC to reach the conclusions in the GEIS should be clearly explained. It appears that many of the conclusions reached were based entirely on expert judgment, and while this approach is completely acceptable, the specific procedures used to elicit and document the expert judgments should be included in the GEIS, including how inherent biases were addressed. Without this infomation, a reviewer is left wondering how conclusions were made.

Response: The NRC acknowledges that some expert judgment is necessary to reach some of the conclusions presented in the GEIS. However, in its discussion of each issue, the NRC has attempted to include specific references to sources of infomation, the type of infomation used in reaching its determination on the environmental impact, and to the extent possible, the specific criteria used in making its assessments.

Concern Nmbr: GIS.004
Topic: Generic Environmental Impact Statement
Subtopic: Plant documentation
Associated Comment Nmbr(s): W04.011
Concern: An Oregon Department of Energy representative was concerned that the documentation for plant modifications made over the years may not be complete, and therefore, using plant documentation that exists today as a basis for relicensing may result in skipping over some significant things, e.g., for some plants the procedures for configuration control/management may not be adequate.

Response: The NRC notes that the accuracy of existing plant documentation is controlled by a number of regulatory requirements and practices. The plant descriptions contained in the Final Safety Analysis Report are required by NRC regulations to be updated at specific intervals and to reflect the specific changes made to the plant during that interval. The issue of plant documentation is more directly related to the technical and safety issues that will be regulated by the license renewal regulations contained in 10 CFR Part 54. At the time of a license renewal application, the renewal applicant will have to submit an environmental report that updates some of the environmental infomation discussed in the GEIS. This updated environmental report will be available to the public as part of the review process.

Concern Nmbr: GIS.005
Topic: Generic Environmental Impact Statement
Subtopic: Public meetings
Associated Comment Nmbr(s): W04.031
Concern: With regard to previous comments from State representatives on public participation, a lawyer suggests that the real question that was being asked (see W04.025 and W04.026) was is the rulemaking process created by the NRC reaching enough people. Along this line perhaps it might be useful to convene a meeting like this workshop in other parts of the country to permit greater public participation at various State levels.

Response: The NRC received more than 100 comment letters from a broad spectrum of private citizens, State agencies, public interest groups, and the nuclear industry on the initial rulemaking.

In addition to one national workshop on the contents of the proposed rule, the NRC held three regional workshops on specific concerns raised by State governments. During these regional workshops, State officials and representatives from local public interest groups were specifically invited to participate. Following these regional workshops, the NRC published for public comment some revised positions. Again the NRC received comment letters from a broad spectrum of the population. In sum, the NRC believes that it has made a reasonable and adequate effort to involve members of the public in this rulemaking.

Concern Nmbr: GIS.006
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach
Associated Comment Nmbr(s): W11.049
Concern: Assuming that the purpose of the workshop on license renewal is to address the merits of the rulemaking and the GEIS, an MDPS representative questioned whether the proposed approach provides cost and timeliness benefits. He thinks there might actually be a negative effect.

Response: The costs and benefits of proceeding with the proposed rulemaking are detailed in the Regulatory Analysis supporting this rulemaking. During the comment period, the NRC received a number of comments on the methods used to calculate the expected savings from proceeding with this rulemaking. The NRC has revised its calculations based on the comments and the revised estimates continue to support proceeding with rulemaking in this area. For specific details of the analysis, see the Regulatory Analysis.

Concern Nmbr: GIS.007
Topic: Generic Environmental Impact Statement
Subtopic: Cost-benefit analysis
Associated Comment Nmbr(s): 001.001 081.002 106.007 116.004 A113.007
Concern: The Windham Regional Commission commented that the GEIS incorrectly presumes that, with refurbishment, applications for license renewal are feasible. The closure of Yankee Rowe demonstrates that the cost of refurbishment may outweigh the benefits of an additional term of operation.

The Deerfield River Compact argues that accurate cost-benefit conclusions cannot be drawn on the merits of an additional 20 years of operation until the relicensing assessment includes an analysis of all costs of nuclear generating facilities, i.e., the fuel production costs, the plant costs, the liability costs, and the waste disposal costs.

Additionally, a private citizen believes the GEIS analysis is limited to short-term cost savings and does not consider the long-term costs of license renewal. He believes that given the high rate of system failures, shutdowns for repair, and decreasing efficiency demonstrated by aging reactors currently in operation, it is apparent that renewing an operating license without review and subsequent repairs and upgrades will only lead to greater long-term costs in terms of adverse effects on public and environmental health.

Another private citizen commented that the NRC's statement that the ". . . renewal of any operating license for up to 20 years will have accrued benefits that outweigh the economic, environmental, and social costs of license renewal" is a value-laden judgement that is not supportable.

Response: The central theme of these comments focuses on the determination that when the costs of refurbishment are added to the costs of additional operation, the benefits of continued operation outweigh the incremental costs. The NRC proposed this conclusion as part of its initial rulemaking and was prepared to define by rule that license renewal was the preferred alternative for generating power given the range of alternatives evaluated in the GEIS.

However, based on the comments received, the NRC is no longer proposing to determine that license renewal is the preferred alternative through a comparison of economic costs and benefits. In addition, the NRC has further restricted its assessment of alternatives by neither evaluating nor considering the economic costs of each alternative. The revised approach will require the NRC to evaluate a range of alternatives, including license renewal, at the site-specific application review stage, and determine the environmental impacts of each alternative. The NRC will recommend proceeding with license renewal if the impacts from license renewal reasonably fall within the range of environmental impacts of the alternatives considered.

Concern Nmbr: GIS.008
Topic: Generic Environmental Impact Statement
Subtopic: Corrections
Associated Comment Nmbr(s): 007.001 032.017 032.022 032.023 032.024 032.025 032.026 032.027 032.028 032.029 032.030 032.031 032.032 061.012 071.002 071.003 071.004 501.001 501.002 501.003
Concern: Representatives of NSP, Arizona Public Service Company (APSC), OCRE, Risk Analysis Corporation, and Winston and Strawn submitted the following corrections:

1. David E. Janes, an engineering consulting firm representative, noted the misspelling of his name, which appears as James in the GEIS, page 4-53, line 7, and page 4-124, line 5.

2. In the GEIS on page 4-56, line 40, the correct reference to Chapter 7 for Easterly is probably ORNL/TM-11728 by Easterly, et al., rather than Easterly's article in the *American Journal of Epidemiology*.

3. In the GEIS, page 4-57, line 35, the units in the denominator of the expression "10 to 100 mA/cm^2" should be m^2 (meters squared). The threshold current density for direct stimulation of nervous tissue is on the order of 0.1 mA/cm^2. A current density of 1 mA/cm^2 (10 A/m^2) is above the threshold for fibrillation in dogs.

4. The Carolina Virginia Tube Reactor (CVTR) should not be listed as being "in SAFSTOR with continued license" in Table 7.1 since there is no current NRC license in place for the CVTR and it is not in SAFSTOR as defined by 10 CFR Part 50.

5. A possible error in the GEIS appears on pages 2-5 and A-49. The nearest city to the Perry Nuclear Power Plant is Mentor, Ohio, which is about 12 miles from the plant.

6. Section 4.3.4.1.1, "Ambient Salts and Cooling-Tower Drift," page 4-28 of the GEIS indicates that "source water for cooling at Palo Verde had 10,000 to 26,000 ppm total dissolved solids" because "most of the water is treated sewage effluent and irrigation waste." In fact, the makeup water "source" is the onsite reservoir containing treated sewage effluent water that has received further onsite processing and includes no irrigation return water constituents. The reference cited, the NUS Corporation annual report on the deposition monitoring program for 1989, presents the annual mean concentration of total dissolved solids in that makeup water as 948 ppm. The concentrations mentioned in the GEIS are those of the circulating cooling water and represent the concentration achieved after evaporation of the makeup water in the cooling tower circuit.

7. Section 4.3.4.1.2 of the GEIS asserts that continuing cooling tower drift in the range of "25 to 50 kg/ha/year" may "significantly increase soil salinity and thus affect native and agricultural plants." Thus, Sections 4.3.4.3 and 4.3.4.1.2 suggest the need for "ongoing monitoring at Palo Verde." The results of the salt drift monitoring program at Palo Verde indicated no consistent or statistically significant correlations between drift deposition and changes in soil sodium, salinity, or in the health of onsite native vegetation communities, so on January 1, 1992, the monitoring program was discontinued. Thus, the references to this monitoring program should be deleted from the GEIS.

8. In the GEIS, Appendix A, page A-47, the summary descriptions of the Palo Verde Cooling Water System should be corrected to read:

   "Type: mechanical draft cooling towers
   Source: Phoenix city sewage treatment plant effluent."

9. In the GEIS, Table 7-1, page 7-8, line 16, note that the Pathfinder is located in Sioux Falls, South Dakota.

10. In the GEIS, Appendix A, page A-41, line 2, note that the Monticello plant is located 35 miles from Minneapolis.

11. On page A-41, line 26 of the GEIS, the amount of land NSP owns at the Monticello site is 2,150 acres, not 1,325 acres.

12. On page A-41, lines 29 and 40 of the GEIS, the 1990 census information is available and should be used to show populations. The 1990 population within a 50-mile radius of Monticello is 2,240,000.

13. On page A-41, line 33 of the GEIS, change "Nearby Features" to read "The business district of Monticello is about 2 miles SE."

14. On page A-52, line 30 of the GEIS, according to the 1990 census Minneapolis has a population of 368,380.

15. On page A-52, line 33 of the GEIS, land use within 5 miles of the Prairie Island Plant would be better described as dairy farming and agricultural. Also "vegetable canning" should be changed to "agricultural."

16. In Table B-1 of the *Federal Register* notice (56 FR 47031): Change ". . . CWA 316(b) determination . . ." to ". . . CWA 316(a) determination . . ." is required for heat shock.

17. On page A-52, line 34 of the GEIS, change "Nearby Features" to read "The business district of the town of Red Wing is about 6 miles SE."

18. On page H-15, line 5 of the GEIS, the net MWe for Monticello plant is 536 MWe not 525 MWe.

19. On page H-15, line 9 of the GEIS, it has been estimated that the amount of replacement power required above the 6 weeks needed for refueling will be less than 2,000 hours for Monticello, not 14,200 hours.

20. On page H-15, line 6 of the GEIS, the refurbishment cost given for Monticello is 4 times larger than found in recent calculations. Reevaluate the use of the Monticello cost data from the Sandia National Laboratories report, SAND88-7095, *Cost Savings from Extended Life Nuclear Plants*.

Response: The text has been revised in accordance with the comment.

(1) "James" has been changed to "Janes" in accordance with the comment.

(2) The reference has been changed (see revised Section 4.5.4.1)

(3) The units have been changed to mA/m^2.

(4) Table 7.1 notest that the CVTR has a by product license.

(6-9) The text has been revised in response to the comment.

(10)-(11) Text has been changed.

(12);(14) The 1980 population and projections will be used because the census does not project population at various radii of the plant site.

(13);(15);(17) Text has been changed.

(16) Table B-1 has been revised.

(18); (19); (20) Draft Appendix H has been deleted.

Concern Nmbr: GIS.009
Topic: Generic Environmental Impact Statement
Subtopic: Nuclear power plants covered by GEIS
Associated Comment Nmbr(s): 041.001 056.016 061.011 063.020 078.001
Concern: The DOI and the OCRE recommended that the scope of the GEIS relicensing action not include Washington Public Power Supply System (WPPSS) Units 1 and 3, Grand Gulf Unit 2, or Perry Unit 2. Grand Gulf has been officially canceled, and it is likely that the remaining units will be also. The DOI indicated that this recommendation should be carried out if new information on resources exist, or the project plans change or have changed since the last NEPA document, or significant impacts to the environment are involved.

NUMARC commented that WPPSS Units 1 and 3, Grand Gulf 2, and Perry 2 should be included in the scope of the GEIS. As the GEIS evaluates environmental issues associated with license renewal, it is reasonable to assume that the environmental impacts at each of the presently excluded licensees would also be enveloped by the GEIS.

Similarly, the WPPSS believes that the proposed rule and the GEIS should be revised to include WPPSS Units 1 and 3. The revision should clearly state that the proposed rule and GEIS apply to "power reactors currently licensed to operate and plants that have been issued and currently hold construction permits, have undertaken substantial construction, and have not been terminated."

Finally, legal counsel for the Cleveland Electric Illuminating Company disagrees with the exclusion of Perry Unit 2 from the scope of the proposed rule.

Response: The NRC has decided to keep the set of 118 nuclear power plants considered in the draft GEIS. Thus, WPPSS Units 1 and 3, Grand Gulf Unit 2 and Perry Unit 2 are not considered in the analysis.

Concern Nmbr: GIS.010
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach/Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 075.001
Concern: The PSCW claims that (1) the proposed limits in the draft GEIS and the *Federal Register* notice are narrow and do not provide for the analysis of possible ranges of variation or of scenarios; and (2) the bounds are severely flawed with respect to need, alternatives, and electromagnetic field (EMF), which should be designated as Category 3 issues.

Specifically the PSCW argued that need for capacity and energy changes rapidly in response to changes in the economy and public policies. The PSCW stated its position that it will be responsible for making its own determination for energy and capacity through State regulatory processes.

The PSCW also argued that the analysis of alternatives was flawed because the NRC limited its evaluation of alternatives to only alternatives that can supply capacity equal to that presently generated at operating nuclear units. The NRC should consider a mixture of options to supply capacity.

For EMF, the PSCW suggested that the NRC did not examine specific studies or recognize the current research in this field and the possibility that future research may result in changes in routes of transmission lines.

Response: The NRC has made a number of changes to the GEIS to address these concerns. Specifically, the NRC removed any attempt to discuss or evaluate future energy needs as part of this GEIS. The NRC recognizes the role that State regulatory agencies and utilities play in determining the energy needs and mixture of energy generating capacity. The revised NRC approach will no longer require an assessment of energy needs at the license renewal application phase.

The NRC recognizes that there are numerous combinations of existing energy generating technologies that can be used to meet identified energy needs. However, consideration of all the various mixes of alternative energy sources would logically yield an infinite number of alternatives. The NRC and the CEQ NEPA regulations require consideration of a reasonable range of alternatives. Therefore, the NRC believes that consideration of discrete alternative sources of energy is adequate. It should be noted, however, that the NRC's comparison of the environmental impacts of license renewal with the environmental impacts from the range of reasonable alternatives will inherently bound all expected environmental impacts from various combinations of alternative energy sources.

Scientific evidence on the chronic biological effects on humans from exposure to transmission line EMF is inconclusive. The NRC will continue to monitor research initiatives. If the NRC finds that a consensus of adverse health effects has been reached by appropriate Federal health agencies, it will require applicants to submit plant-specific reviews of such health effects.

Concern Nmbr: GIS.011
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach
Associated Comment Nmbr(s): 079.001
Concern: The State of Vermont indicated that its Nuclear Advisory Panel, which is strongly opposed to the GEIS for license renewal, adopted the following resolution:

> "The Vermont State Nuclear Advisory Panel encourages the Department to pursue and to complete a strong statement of exceptions and opposition to the GEIS. And furthermore, the Panel expressed its concern that the GEIS, in combination with the standardized plant and combined construction/operating license features of the license reform proposal, represents a trend toward increased centralized control over the commercial nuclear power plant licensing process that significantly impedes the participation of citizens and the States in the process."

Response: The original NRC approach to assessing the environmental impacts of license renewal on a site-specific level centered around the premise that the impacts of operation and refurbishment activities could be well-defined and bounded. The NRC reviewed extensive numbers of published documents that presented data concerning costs of repairs, radiological exposures, radiological releases, and generation of high- and low-level wastes, to name just a few. The NRC involved the public in this rulemaking in which it presented its data and determined that

these impacts were bounding for the range of impacts expected to occur at any specific plant, and therefore, the number of potential impacts that would be called into question on a site-specific license renewal application would be small.

As a result of the comments on this rulemaking, the NRC has revised its approach to permit broader participation at the site-specific level, but still retaining the position that a broad range of impacts could be defined, bounded, and removed from site-specific evaluation by rulemaking. The revised NRC approach will now permit individuals to provide comments on all potential environmental issues at the site-specific application review stage. The NRC will assess the merits of the information provided and determine if the information presented would change its conclusions made as part of the rulemaking. If it does not, the issue of the potential impact will not be open for discussion as part of the site-specific review. If the information is significant, the NRC will assess the impact for the site under review and then evaluate the need to revise the rule. Finally, the NRC will periodically review the GEIS to determine if changes are required to reflect new information. The public will continue to have an opportunity to comment on changes to the GEIS as part of this process.

Concern Nmbr: GIS.012
Topic: Generic Environmental Impact Statement
Subtopic: Cost-benefit analysis
Associated Comment Nmbr(s): W11.002 W11.009 W11.010 W11.011 W11.030 W11.034 W12.028 W12.029 W12.044 032.013 032.014 032.015 032.016 032.033 032.034 032.035 060.003 064.010 079.031 079.034 079.047 079.048 079.056 079.057 079.058 079.059 079.063 079.065 079.067 079.068 079.078 079.081 079.094 079.095 079.096 079.098 079.100 079.109 087.013 087.014 087.120 107.002
Concern: Federal and State agencies, industry representatives, and a public interest group raised concerns regarding the cost-benefit analysis used in the draft GEIS and referenced in the draft amendments to 10 CFR Part 51. These concerns relate to the type of analysis performed and the individual factors analyzed.

A. Concerns Regarding the Type of Analysis Performed

The EPA stated that the cost-benefit analysis for relicensing should not be confused with the analysis required by the CEQ NEPA regulations. The CEQ's regulations, in 40 CFR Part 1500, call for a clear comparison of the alternatives, not a cost-benefit analysis of the proposed action in isolation. The EPA believes that a cost-benefit analysis of all alternatives, with results compared across alternatives, is more suited to satisfying these provisions of the NEPA regulations. Moreover, it believes that NRC's proposal to allow the license renewal applicant to introduce plant-specific information is one-sided. It referred to the draft "Guidance for the Preparation of Supplemental Environmental Reports," which states that license renewal applicants may consider those areas where their plant's impacts are clearly less or the benefits clearly greater than those found generically in the GEIS (p. 43). The EPA pointed out that allowing such favorable information may tend to distort the benefit-cost analysis since the majority of issues are already designated as Category 1 and having small impacts.

The CEQ stated that neither its regulations nor NEPA require a cost-benefit analysis. The NRC's evaluation of license renewal alternatives focused on economic costs and benefits; it did not

adequately account for the environmental costs and benefits of license renewal. Representatives from the States of Minnesota, Wisconsin, and Vermont also raised the issue of the NRC's failure to account for environmental and economic externalities in its cost-benefit analysis. Minnesota contends that a social cost approach must be taken to decide whether nuclear power-generation is needed. This approach includes both the internal and external costs of a project. The cost to society of bearing the risk of nuclear power is an external cost that is appropriate to apply.

The State of Vermont disagreed with the draft GEIS conclusion in Section 10.6 that there will be accrued benefits that outweigh the costs of license renewal. Vermont believes this conclusion is unwarranted and unsupported for all nuclear power plants in general, and for Vermont Yankee specifically; it believes that this determination must be reserved for plant-specific applications. Moreover, it contends that the draft GEIS treatment of the balancing portion of the NEPA review on pages 10-2 and 10-3 is inadequate because the issue of balancing economic costs against environmental benefits (or against different categories of environmental impacts) should be addressed in a comprehensive and systematic manner. It also asserts that the NRC must consider qualitative environmental factors, as well as quantitative factors, in its determinations.

The Attorneys General of the States of Connecticut, Minnesota, New York, Vermont, and Wisconsin stated that the costs included in nuclear production should not be limited to the direct costs. The cost of damage to the environment is also an important consideration.

In addition, Union Electric stated that the cost analysis of coal, as an alternative to license renewal, should take into account the costs associated with complying with the 1990 amendments to the CAA.

B. Concern About the Economic Analysis Required in Individual Plant Renewal Application

Noting that an economic analysis is not required by NEPA, NSP questioned the requirement in proposed Section 51.53(c)(3)(ii)(J), which would require the license renewal applicant to demonstrate that "the replacement of equivalent generating capacity by a coal-fired plant has no demonstrated cost advantage over the individual nuclear power plant license renewal." It believes that such a requirement would force the applicant to perform an economic analysis of an alternative to license renewal. It argued that a coal-fired plant is not environmentally preferable to a nuclear plant, and therefore, an economic analysis would contradict Federal case law.

C. Concerns Regarding the O&M Costs

NSP expressed the need for more detail on the economic threshold analysis (i.e., providing the underlying assumptions for the analysis presented in Appendix H) in order to help ensure that a license renewal applicant can perform the analysis and defend it as reasonable. Specifically, (1) the cost numbers presented in Table H-7 for Monticello are high; and (2) there is insufficient explanation given in Appendix H to really know how to use the information provided in Tables H-12 and H-13. NSP suggested that on page H-28, lines 9 and 11, a description of what goes into the O&M costs should be included so that it is standardized for users of Table H-12. It also noted that Federal Energy Regulatory Commission (FERC) Form 1 information may be a good source of data. NSP suggested that a detailed description of the derivation of the equation used in Table H-13 (p. H-29, line 14) be given to increase the understanding of the factors which are included when this equation is used. This would enable license renewal applicants to

determine how they fit into the threshold economic analysis. It asked NRC to clarify whether the value of $20/kW(e) is acceptable for use in calculating the operation cost maximum using the equation on page H-29.

The UCS found no valid basis for the assumption that the rapid escalation of O&M costs will cease during the license renewal period.

Response: The GEIS has been revised to address only the environmental impacts of license renewal and the alternatives. A cost-benefit analysis will not be perfomed. As a result of the comments on this rulemaking, NRC staff revised its approach to permit broader participation at the site-specific level, while maintaining the position that a broad range of impacts can be defined, bounded, and removed from site-specific evaluation by rulemaking. The revised approach will now permit individuals to provide comments on all potential environmental issues at the individual plant review stage. The NRC will assess the merits of the information provided and determine if the information presented would change its conclusions made as part of the rulemaking. If it does not, the issue of the potential impact will not be open for discussion as part of the site-specific review. If the information is significant, the NRC will assess the impact for the site under review and then evaluate the need to revise the rule. Finally, the NRC will periodically update the GEIS to reflect new information and the public will continue to have an opportunity to comment on changes to the GEIS as part of this process.

Concern Nmbr: GIS.013
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach
Associated Comment Nmbr(s): 063.002 080.001
Concern: Consolidated Edison commented that the NRC should more clearly state in the supplementary information accompanying the proposed rule that only those incremental environmental impacts associated with operation beyond the initial license term need be reviewed for license renewal. The commenter believes this is analogous to the Current Licensing Basis principle which underlies 10 CFR Part 54 regulations for assessing the radiological safety impacts of license renewal. The final Part 51 rule should make it clear that the bases and logic for assessing the radiological and environmental effects of license renewal are the same. Specifically, the commenter proposed the following amendment to Supplementary Information Section III.A. (56 FR 47018):

> ". . . These amendments would require the applicant to address only those environmental issues that require a plant specific assessment as part of an application for each plant. The applicant's environmental review will consider only the extent to which those environmental issues resulting from license renewal reflect new, further or additional impacts beyond those discussed in the NEPA environmental assessment and/or environmental impact statement prepared at the time of initial licensure of the facility, together with any subsequent amendments or supplements prepared during the initial license term . . . ."

NUMARC commented similarly that, in order to provide consistency in its approach to Parts 51 and 54, the NRC should clarify in the final rule on Part 51 that only those environmental impacts

in Categories 2 and 3 attributable to extended unit operation are appropriate for examination in connection with individual license renewal reviews.

Response: The NRC agrees that the emphasis on the scope of environmental issues to be evaluated should be limited to those that only occur during any period of extended operation. The NRC's basis for this position is well documented both in the Statements of Consideration for the proposed rule and in the GEIS. The NRC disagrees with Consolidated Edison that the proposed language needs to be added to the Statements of Consideration for the final rule. No changes were made as a result of this comment.

Concern Nmbr: GIS.014
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach
Associated Comment Nmbr(s): 086.005
Concern: Trout Unlimited, a public interest group, believes that the data obtained for the GEIS may have been based on the original license, and that this data—as well as additional or more current data—need to be assessed based on present technological standards, which may not have been available at the time of the original license.

Response: The data collected to support the positions taken in the GEIS are based on current information. The information contained in some of the original licensing documents was updated by more recent information obtained from actual plant data and from the licensees. The NRC notes that some ecosystem information will have to be supplied on a site-specific basis. For example, an applicant for license renewal will have to discuss its current programs for identifying and monitoring, as necessary, any endangered species in the vicinity of the plant. No change in the GEIS has been made as a result of this comment.

Concern Nmbr: GIS.015
Topic: Generic Environmental Impact Statement
Subtopic: Plant performance
Associated Comment Nmbr(s): 083.004 087.008b 118.001
Concern: The EPA noted that differences in individual plant performances must be taken into account in the GEIS. Since plant performance can vary greatly even between plants owned by the same parent company, a plant's performance rating should be factored in. Moreover, the GEIS does not adequately consider the differences between BWRs and PWRs. BWRs are known to have more extensive contamination and higher exposure levels compared to PWRs. Since both the external and internal exposures are higher, a Category 1 ranking does not seem appropriate. Additionally, the Massachusetts House of Representatives pointed out that the closure of Yankee Rowe should be used to reevaluate the significance of older plants and projected plant performance in the relicensing process. Yankee Rowe's closure occurred while the GEIS was in the comment phase and is not reflected in the GEIS relicensing approach.

Response: Evaluation of individual plant performance is continuously performed by the NRC. This process includes plant inspections and Systematic Assessment of Licensee Performance. Plant performance is beyond the scope of the NRC's NEPA review for license renewal.

NRC staff recognizes the fact that BWRs have higher exposures than PWRs. As a result, the GEIS exposure analysis is based on dose estimates for BWRs as an upper bound.

Yankee Rowe was closed for reasons that are outside the scope of and therefore are not relevant to the GEIS.

Concern Nmbr: GIS.016
Topic: Generic Environmental Impact Statement
Subtopic: Rulemaking & GEIS approach
Associated Comment Nmbr(s): 010.001 010.005 022.001 027.002 106.004 A113.004
Concern: The Deerfield River Compact pointed out that several site-specific issues are not included in the GEIS (e.g., plant operating history; seismic risks; adjacent site hazards; economically valuable fisheries and recreation areas in the Deerfield River and surrounding countryside; and radiation impact on micro-climatic, surface terrestrial, and groundwater pathways).

NU-END commented that the GEIS fails to address many types of site-specific impacts and regional effects. They also commented that the GEIS should include a Category 3 provision for assessment of each plant's operating history.

A private citizen believes that because of the nuclear power industry's safety record, it is necessary to ensure that safeguards are being met. With generic environmental statements, safety is unnecessarily compromised.

Another public interest group, Action for a Clean Environment, noted that the GEIS does not take into account safety records. For example, the commenter states that the Vogtle plant has one of the worst safety records. Does the GEIS mean that Vogtle could be examined generically and declared as safe as other nuclear plants?

Response: There is no known physical basis for micro-climate impacts resulting from radioactive effluents from nuclear power plants. Terrestrial and aquatic pathways of effluents to humans are important and long recognized issues. Because of their importance to potential human dose, the NRC Technical Specifications for each plant, the NRC regulations for licensees, and Federal law all require consideration of these pathways. A review of effluents and offsite doses from each licensed plant, as described in the GEIS, has produced no evidence of exceeding the appropriate regulation or law. For the most part, plants are emitting far below allowable levels of liquid and gaseous effluents.

Beyond the point of law, because of concerns raised by recent studies from the United Kingdom regarding certain nuclear installations, a survey of cancer rates in populations living near nuclear facilities in the United States was conducted by the National Cancer Institute (NCI) (*Cancer in Populations Living Near Nuclear Facilities*, U.S. Department of Health and Human Services (DHHS), Public Health Service, National Institutes of Health (NIH), NIH Publication No. 90-874, July, 1990, for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402). The study encompassed all 62 nuclear facilities that went into service prior to 1982, including commercial electricity-generating plants and major DOE facilities engaged

in nuclear fuel reprocessing, isotope separation, or other activities involving radioactive materials. Over 900,000 cancer deaths occurring from 1950 through 1984 in 107 counties with nuclear installations and certain adjacent counties in the United States were evaluated. For counties in two States, cancer incidence data were also available and evaluated. Each study county was matched for comparison with three similar control counties in the same region. Over 1,800,000 cancer deaths occurred in these control areas. There was no evidence to suggest that the occurrence of leukemia or any other form of cancer was generally higher in the study counties than in the control counties. For childhood leukemia, the relative risk comparing the study counties with their controls before plant startup was 1.08, while after startup it was 1.03. For leukemia at all ages, the relative risks were 1.02 before startup and 0.98 after startup.

The survey results showed that some of the counties in the study had higher rates of certain cancers, and some had lower rates, either before or after the facilities came into service. The observed comparisons provided no evidence of any cause-effect relationship between particular facilities and cancer occurrence in nearby populations. The study is limited by the correlational approach and the large size of the geographic areas (counties) used, and of course it cannot prove the absence of any effect. However, if any excess cancer risk was present in U.S. counties with nuclear facilities, it was too small to be detected by the methods employed in this survey.

Occupational doses for all reactors are reported on a quarterly basis and computed on an annual basis. These data, including those for Maine Yankee, were reviewed by the NRC to identify any potential excess exposure associated with relicensing activities. Refurbishment activities will require careful attention to health physics concerns. The NRC concluded however, that refurbishment and operation under the relicense rule could be done safely.

The GEIS addresses the environmental impacts of license renewal. Safety issues related to license renewal will be reviewed for each specific plant pursuant to 10 CFR Part 54.

C-6. Topic: Groundwater Quality (GRW)

Groundwater (GRW)

Concern Nmbr: GRW.001
Topic: Groundwater
Subtopic: Monitoring system
Associated Comment Nmbr(s): 008.001 087.037
Concern: The EPA commented that the GEIS should include provisions for instituting monitoring programs for both the cooling pond water and groundwater of the uppermost aquifer underlying the facility. The EPA believes that the monitoring program should be based on an understanding of the site hydrogeology (groundwater flow direction and rate, degree of aquifer interconnection, porosity, and storativity) and should make provisions for quality assurance and quality control of data. The GEIS should also include a paragraph which commits to remedial action(s) should the monitoring programs detect a release of a hazardous substance pursuant to relevant Federal, State, and local hazardous waste management requirements.

An Ohio Department of Natural Resources representative commented that additional requirements may be necessary in the GEIS to protect groundwater quality and availability. Specifically, a groundwater monitoring system should be required for each plant. The objectives of the program should be four-fold: (1) verify the productivity of the aquifer, (2) demonstrate groundwater dispersion effectiveness for contaminants in the event of a spill, (3) evaluate the stability of materials below the site, and (4) verify that adequate protection exists to prevent (primarily) cooling pond water from infiltrating into the aquifer below the site.

Response: The NRC agrees with the EPA's comment that groundwater in the uppermost aquifer should be monitored around the perimeters of large cooling water ponds. However, the NRC would not extend elaborate groundwater system requirements to other nuclear power plants that do not use cooling water ponds.

A single strategically located, downgradient monitoring well would be sufficient to detect an unlikely release of contaminants from controlled areas of nuclear power plants. All hazardous and radioactive materials are stored in controlled areas. Release of these contaminants to the environment would only occur during high consequence-low probability catastrophic accidents, and not during routine operations. Monitoring of groundwater and mitigation of potential contaminant releases to groundwater after a catastrophic accident are discussed in Chapter 5 of the GEIS.

As an alternative to elaborate, routine monitoring of groundwater at all facilities, operators would be required to demonstrate that hazardous and radioactive materials are contained in controlled areas. Liquids leaking from pipelines or storage tanks would drain to sumps, or to adequately diked or curbed areas having impermeable floors. A spill prevention control and countermeasure plan would be approved by appropriate regulatory agencies. The emphasis would be on spill prevention and containment, rather than environmental cleanup.

Concern Nmbr: GRW.002
Topic: Groundwater
Subtopic: Water use conflicts-categorization
Associated Comment Nmbr(s): 063.019 087.035
Concern: The EPA commented that a sufficient expendable water supply is essential for the operation of nuclear power plants, especially those with cooling towers or cooling ponds. Surface water withdrawals for cooling tower makeup water could reduce aquifer recharge leading to reduced groundwater supplies. Since projected human use may compete with power plants for water supply, groundwater use conflicts should be considered a Category 2 issue. Although a water use or water rights issue should be resolved with the appropriate State or Federal agencies, it should not be settled independently, but should be addressed as part of the relicensing process to ensure an adequate water supply and equitable water use during the license renewal period.

NUMARC commented that the issue of Use of Groundwater for Cooling Tower Makeup should be changed from Category 2 to Category 1. The GEIS conclusion is solely based on data from Ranney wells at Grand Gulf. However, previous pump tests at Grand Gulf have concluded that the water table in the floodplain alluvial is the only affected area, and that no groundwater users will be impacted. Additionally, this issue was addressed by Grand Gulf in their FEIS, which concluded that there was no impact.

Response: Based on the new definition of the issue categories (i.e., discussed in Section 1 of the GEIS), the issue of groundwater use conflicts resulting from surface water withdrawal for cooling tower makeup is now Category 2 for plants that withdraw water from small water bodies during low-flow conditions (see Table 9.1 of revised GEIS). A factor considered in the GEIS analysis is the potential for reduction in aquifer recharge as a result of competing water use. The GEIS has identified that water use conflicts are already a concern at two closed-cycle nuclear plants (Limerick and Palo Verde). Such conflicts arising during the license renewal period could be of small or moderate significance. Furthermore, the effects of consumptive water use on instream and riparian communities could also be of small or moderate significance, depending on the plant.

The issue of groundwater use for cooling tower makeup is Category 2 (see Table 9.1), based on the new definition of issue categories, in spite of NUMARC's recommendation to make this Category 1. Although the Grand Gulf Nuclear Station is the only plant that uses Ranney wells to withdraw groundwater, and this cooling water intake does not conflict with other groundwater uses in the area, conflicts could develop if other uses occur in the future. Hence, it is not possible at this time to predict whether or not conflicts will occur at Grand Gulf or to determine the significance of impacts associated with Ranney well use at other plants that choose to adopt this method in the future.

Concern Nmbr: GRW.003
Topic: Groundwater
Subtopic: Water use conflicts
Associated Comment Nmbr(s): 087.034
Concern: The EPA believes that power plants surrounded by extensive salt marshes should consider water use conflicts as part of the relicensing process so as not to mine and possibly deplete a potential Paleo-groundwater resource that may not be replenished by recharge.

Response: A site-specific review of groundwater use for potable and service water will be required for any plant that consumes groundwater at rates greater than 100 gpm and has private wells located within the cones of depressions of the plant's wells. Moreover, plants that consume more than 100 gpm of groundwater, but are located at sites surrounded by extensive salt marshes are no longer exempted from the site-specific review. Section 4.8.1.1 of the GEIS has been revised to remove the salt marsh exclusion.

Concern Nmbr: GRW.004
Topic: Groundwater
Subtopic: Saltwater intrusion-categorization
Associated Comment Nmbr(s): 087.036
Concern: The EPA believes that the issue of groundwater quality degradation due to saltwater intrusion should be considered a Category 2 issue. Just because some nuclear power plants are minor contributors to saltwater intrusion does not preclude their respective impacts on affected aquifers. Moreover, the comment in Section 4.2.2.2.1, "Saltwater intrusion into confined aquifers is not yet considered to be a problem in Florida, . . ." is a false statement; saltwater intrusion is occurring that also may justify this as a Category 2 issue.

Response: Where saltwater intrusion has been a problem, the large uses have been agricultural (irrigation) and municipal groundwater consumption. Groundwater consumption by nuclear power plants is small by comparison, and does not contribute significantly to the saltwater intrusion problem. Plants that withdraw groundwater at rates of less than 100 gpm are expected to have no significant impact on neighboring groundwater users. There are no instances where nuclear power plant consumption has induced saltwater intrusion. Where saltwater intrusion does exist, it is expected that water use permits for nuclear plants issued by water management agencies would incorporate the necessary controls and restrictions. Regional water boards could impose limits on industrial, municipal, and agricultural users, including nuclear power plants. A nuclear power plant could accommodate its share of groundwater use curtailment without a significant effect on its operations. Therefore, this issue remains as Category 1.

The sentence, "Saltwater intrusion into confined aquifers is not yet considered to be a problem in Florida", has been deleted (draft GEIS p. 4-14, lines 21–22).

Concern Nmbr: GRW.005
Topic: Groundwater
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 087.039
Concern: The EPA believes that potential impacts on sole source aquifers should also be evaluated in the relicensing process for power plants which rely on such resources.

Response: At this time, no licensed plant is located on a sole source aquifer. Should a site occupied by one of the licensed nuclear plants be in an area designated in the future as a sole source aquifer, NRC would cooperate with responsible agencies in making required information available. Groundwater usage impact would be evaluated for those sites where the usage rate exceeds 100 gpm. Lower usage rates are not expected to significantly impact a sole source aquifer.

Concern Nmbr: GRW.006
Topic: Groundwater
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 087.038
Concern: The EPA believes that potential sink hole formation from lowered potentiometric heads in confined aquifers should be evaluated in the relicensing process for power plants which depend on those groundwater resources.

Response: Because of concern over reactor safety, sink-hole collapse is addressed in the safety analysis report at those sites where there is a potential for sink-hole formation. The phenomenon is limited to sites underlain by carbonate rock, rock salt, or gypsum.

Most lowered potentiometric heads result from copious production of groundwater as in agricultural irrigation or mine dewatering. Power plants that use less than 100 gpm would not be expected to contribute significantly to declining heads. This issue would be addressed at sites where more than 100 gpm of water are consumed (i.e., Category 2).

Concern Nmbr: GRW.007
Topic: Groundwater
Subtopic: Categorization of issues
Associated Comment Nmbr(s): 054.053 054.057 054.075
Concern: The State of Minnesota noted that the GEIS discussed groundwater quality impacts, but does not address the tritium found in the wells at PI. This incident should be included in the GEIS. Before either Monticello or PI is relicensed, surface water, groundwater, and drinking water quality data specific to both plants must be evaluated and the health risks assessed. Making standard assumptions about water consumption of 2 liters/day results in a dose rate of 0.16 to 0.2 mrem/yr, which is 2 to 4 times Minnesota's criterion dose rate of 0.054 mrem/yr. MDPS also believes that groundwater quality effects should be a Category 3 issue, and that the conclusion that releases to groundwater at all plants is a Category 1 issue is unfounded because a number of power plants fall outside the bounds of the analysis.

Response: Section 4.8.2 of the GEIS has been revised to address the tritium groundwater contamination in the groundwater at PI, which was found in well water at levels 20 times lower than national drinking water standards, representing an insignificant impact (see Section 4.8 of the GEIS). Although addressed in the final GEIS, there is no reason to believe that tritium contamination of groundwater will be a significant concern at any nuclear power plant. Neither the MDPS nor other commenters identified any significant groundwater or surface water impact for a particular plant that would be considered outside the bounds of the GEIS analysis. The NRC, however, has revised the license renewal review process to allow the public to comment on all Category 1 issues, including those related to groundwater and surface water quality. This action gives the public an opportunity to provide information which is new and would bear significantly on the NRC staff's analysis in the GEIS.

Additionally, the NRC recognizes that a State's dose criterion may differ from the NRC or Federal criterion. Although it is ultimately the responsibility of the State or local permitting authority to ensure compliance with their differing standards, the NRC is required by its regulations (10 CFR 51.71[d]) to consider, in all EISs, the status of compliance with environmental quality standards and requirements imposed by outside agencies pursuant to the CWA. Since a SEIS will be prepared for each license renewal application, consideration will be given to an applicant's compliance with other agency environmental standards. To the extent that an applicant does not comply with a particular standard, this issue will be addressed at the site-specific review.

Therefore, except for a case where an applicant is found not to be in compliance with a particular State or local standard as determined in a site-specific SEIS, the NRC does not believe that a site-specific review of groundwater and surface water quality is warranted for license renewal. The NRC believes that the GEIS finding that license renewal operations will have a small impact on groundwater and surface water quality sufficiently envelops the expected effects for all plants.

Concern Nmbr: GRW.008
Topic: Groundwater
Subtopic: Radioactive effluents
Associated Comment Nmbr(s): 038.025
Concern: The MDNR commented that Section 4.8.6 of the draft GEIS does not address the possibility of leaching of radioactive material stored underground into potentially potable water supplies. Since many radionuclides have half-lives well in excess of the minimum container integrity of 300 years and since NUREG-1437 addresses potential environmental effects as much as 1,000 years into the future, groundwater contamination potential should be discussed. The commenter also pointed out that no HLW repository currently exists, and that there is considerable uncertainty when projecting effects 1,000 years into the future.

Response: Radioactive material is not stored underground in tanks at licensed commercial nuclear reactors. The radioactive material at nuclear power plants is stored in tanks located in buildings. The potential impact of the inadvertent release of the contents of tanks stored in these buildings was considered in the accident scenarios at the time of the operating license review.

C-7. Topic: Human Health Impact (HHI)

Human Health Impacts (HHI)

Concern Nmbr: HHI.001
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): W04.001 W04.003 W04.007 W04.018 W04.019 W04.021 W04.022 W04.023 W04.030 054.050 087.048 087.063
Concern: The EPA noted that throughout the GEIS and in Table B-1 of the proposed rule, radiation doses are assigned to Category 1 because the NRC reached a conclusion about the impact that applies to all affected plants. Although the EPA agrees that the radiation exposures are small, it believes that comparison to natural background is not a compelling argument. A more appropriate argument is that the risks associated with the exposures are consistent with the risks judged not to warrant mitigative measures. Moreover, a comparison to background radiation (e.g., p. 4-80) should be avoided since it implies that the risk resulting from natural background radiation is negligible. Also, using the average dose within a 50-mile radius of a plant seems arbitrary. There are two kinds of assessments that are relevant: (1) the maximum dose to members of the public; and (2) the collective dose to the world's population that results from the anticipated license renewal period of a nuclear plant.

In addition, the following points were raised on this issue: (1) the EPA considers background radiation from a lifetime perspective (i.e., about 10 rem), not from an annual perspective (i.e., about 0.1 rem); and (2) the basis for considering what is negligible is unclear since nothing is really negligible if there is some harm associated with it. Moreover, with regard to negligible dose, a Minnesota Department of Health (MDH) representative observed that, in the past the NRC has considered 0.1 millirem as negligible, while the value of 0.05 millirem has been considered as negligible in some risk assessments performed in Minnesota. To correctly address this issue they believe that the NRC should explain that the incremental amount of radiation (from routine releases) at the plant boundary is very small and cannot be accurately measured, and the epidemiological investigations have not been able to correlate this amount of radiation with significant health effects. Therefore the risk of exposure from a nuclear power plant, absent an accident, is small and this risk is less than those associated with other means of electrical power generation.

Response: The text that provides a comparison to natural background radiation and an implication that background effects are small has been deleted. Instead of comparing with background radiation, radiological impacts are considered of small significance if doses and releases do not exceed permissible levels in the NRC's regulations. The AEA requires the NRC to promulgate, inspect, and enforce standards that provide an adequate level of protection of the public health and safety, and of the environment. These responsibilities, singly and in aggregate, provide a margin of safety.

With regard to choosing a 50-mile radius, it merely provides a convenient perspective for comparative calculations. The same arguments could be made using global doses—although, except for ^{3}H and ^{14}C there are no generally accepted models for evaluating dispersion.

Operations under license renewal will not result in substantially different radiation doses than are currently experienced at operating reactors.

One cannot just characterize the risk from exposure from a nuclear power plant as small or say that the risk is smaller than that associated with other means of electrical power generation. Such statements must be backed by substantiated evaluations, calculations, and analyses. A comprehensive comparison of the risks of nuclear power with other generation technologies is not feasible at present because the analyses that such a comparison would have to be based upon have not yet been perfomed.

The type of deference to Minnesota's radiation dose limit and other criteria for measuring radiation risk which Minnesota's comment implies is not supported by the Atomic Energy Act (AEA), as those statutes have been construed by the Federal courts. In *Northern States Power Co. v. State of Minnesota* (447 F.2d 1143, 1153–54 [8th Cir. 1971]), affirmed without opinion (405 U.S. 1035), the court ruled that, notwithstanding the State's interest in controlling pollution from radioactive effluents discharged from nuclear plants within its borders, it could not impose its own environmental protection regulations on such effluents because application of the more stringent State regulations was preempted by the applicable Federal regulations under the AEA. Similarly, the Supreme Court decided that the AEA "created a pervasive regulatory scheme, vesting exclusive authority to regulate the discharge of radioactive effluents from nuclear power plants in the [NRC], and pre-empting the States from regulating such discharges," *Train v. Colorado Public Interest Research Group*, 426 U.S. 1, 16 (1976). The AEA also prevents States from regulating the interstate and intrastate storage, and shipment for storage, of spent nuclear fuel. See *People of State of Illinois v. General Electric Co.*, 683 F.2d 206, 215 (7th Cir. 1982). For purposes of the GEIS and the related Part 51 rulemaking, the NRC will not compare differing radiological impacts, if any, on health, arising from application of State radiological protection standards more stringent than the NRC's.

Concern Nmbr: HHI.002
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.004
Concern: The MDH representative noted that public exposure and occupational health standards are coming down, and it's conceivable that five, ten years from now they might even come down further. Therefore, these should not be "locked" in the GEIS.

Response: The GEIS was prepared using what is known today. The NRC agrees that if significant new information is developed, the conclusions of the GEIS may have to be reconsidered. The public is encouraged to petition the NRC to reconsider its decisions based on the GEIS if significant new information becomes available.

Concern Nmbr: HHI.003
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.005
Concern: An EPA representative suggests that the GEIS should make clear that the estimate of occupational risk (being less than 1 percent of the natural rate of cancer in workers) is for the average exposure of workers, not the individual maximum exposure.

Response: The NRC agrees that, consistent with currently accepted risk estimates, the analysis was performed for the average worker population and average doses. Thus there is no conclusion about maximum individual exposure or risk. Sections 3.8.2.3 and 3.8.2.4 of the GEIS have been modified for clarity. The explicit reference to 1 percent of the natural cancer rate has been deleted.

Concern Nmbr: HHI.004
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.006
Concern: An EPA representative suggests that the risk estimator of 135 cancer deaths per million person-rem used (on p. 4-108 of the GEIS) be updated because the currently accepted value is more on the order of 500 cancer deaths per million person-rem. The NRC has been using 500 for some time now, particularly in its BRC proceedings.

Response: Risk estimators in the GEIS have been changed in accordance with the data provided in NUREG/CR-4214, Rev. 1, Part II, Addendum 1, dated August 1991.

Concern Nmbr: HHI.005
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.008
Concern: An EPA representative found inconsistencies in the estimation of the total impact of the fuel cycle over the long term. In the case of radon from uranium mining and milling operations, the impacts for 100 years, 500 years, and 1,000 years were calculated. This was not done for the other long-life materials. Moreover, in the case of the HLW Repository, those calculations are usually carried out for 10,000 years. In his opinion, the appropriate basis for stopping the calculation is when the impact is not there anymore, not some arbitrary choice of a number of years.

Response: There have always been differences of opinion on how far into the future radiological impacts should be estimated. As noted by the commenter, EPA's HLW regulations (in 40 CFR 191) require that cumulative releases to the environment be calculated out to 10,000 years. However, the 40 CFR 191 standards do not apply to the proposed HLW and spent fuel repository at Yucca Mountain. EPA will develop a separate set of environmental standards applicable to Yucca Mountain pending consideration of a recent National Academy of Science report. The NRC does not believe such estimates should extend beyond 1,000 years for the

purposes of the GEIS. In order to estimate radiological impacts, assumptions must be made concerning radioisotope dispersion, migration, and uptake. These assumptions depend on complex meteorological, geological, hydrological, and population distribution characteristics that cannot be accurately predicted over long periods of time. When attempting to predict thousands of years into the future, uncertainties become very large and estimates become meaningless. In addition, the levels of radioactivity associated with the total impact of the uranium fuel cycle do not present a potential hazard comparable to that from HLW.

Concern Nmbr: HHI.006
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): W04.009
Concern: A MSPO representative questioned how the ALARA principle will be implemented to assure that a power plant utilizes the best radiological control practices given that the public dose due to refurbishment is a Category 1 issue.

Response: The new 10 CFR 20.1101(b) states that a licensee shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. Paragraph 20.1101(a) requires each licensee to develop, document, and implement a radiation protection program, commensurate with the scope of licensed activities, to achieve the ALARA provision. This requirement is mandatory as of January 1, 1994.

Concern Nmbr: HHI.007
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.010
Concern: An Oregon Department of Energy representative pointed out that the GEIS needs to have a more up-front treatment of the whole notion of uncertainty in many of these health issues.

Response: The NRC agrees that there is considerable uncertainty associated with health effects, especially at low occupational public dose levels and particularly with respect to EMF. Health effects estimates from radiation exposures are based on the best scientific evidence available and are considered to be best estimates. Section 4.6.3.2 of the GEIS has been expanded to more thoroughly explain the projected doses for license renewal.

Concern Nmbr: HHI.008
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): W04.013 011.006
Concern: A PDER representative pointed out that public exposure dose should be a Category 2 rather than a Category 1 issue because the last EISs are about 50 years old, and land use and population have changed at these facilities over the years. There may be some very different numbers coming out of new assessments of public health and safety. At the very least, utilities

should be doing new assessments of the effects of these changes. Similarly, the New Jersey Department of Environmental Protection and Energy commented that radiation exposure to the public, currently treated as a Category 1 issue, needs to be treated as a site-specific issue.

Response: The NRC does not agree that a Category 2 determination is necessary. Radiation exposure to the public can be treated as a Category 1 issue because the exposures are expected to be within regulatory limits for all plants.

Concern Nmbr: HHI.009
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): W04.014
Concern: The PDER representative noted that the issue of occupational exposure should be upgraded to Category 2 because the configurations of the plants are different and there are enough differences in contamination that the utility should be verifying that, in fact, the analysis bounds the actual radiation dose when refurbishment activities are perfomed.

Response: The anticipated collective occupational doses attributable to refurbishment under the conservative scenario, developed in Appendix B of the GEIS, are in the range of doses already experienced by a large portion of the nuclear power plant industry. Occupational doses from refurbishment activities are estimated to be less than 1 percent of regulatory limits; hence, the standard of small significance is met. This issue remains Category 1.

Concern Nmbr: HHI.010
Topic: Human Health Impacts
Subtopic: Electromagnetic fields impacts
Associated Comment Nmbr(s): W04.015 W04.029 W04.037 011.005 061.010 075.005 079.011 087.059 501.005
Concern: The EPA believes that it is premature to judge the impacts of EMF on human health. Given the current status of knowledge and EMF impacts, this issue should be considered in the relicensing process for each facility. The proposed rulemaking should state that: (1) Federal agencies are evaluating the public health effects of EMF, and (2) the renewal procedure will address the responsible Federal agency's position relative to public health at the time of renewal. The New Jersey State Department of Environmental Protection and Energy said that the chronic health effects of EMF needs to be treated as a site-specific issue. The PSCW stated that the GEIS did not examine any studies of the occupation effects of exposure to EMF or make any reference to the "Peters Study" (*American Journal of Epidemiology*, 134: 923–937, "Exposure to Residential Electric and Magnetic Fields and Risk of Childhood Leukemia" by London et al.). The PSCW expressed concern about designating EMF as a Category 1 issue because of the pace of the research that is going on and the concerns of the public. It also believes that this issue will require further examination; hence, review at relicensing will be required. Moreover, a lawyer pointed out that the NRC must satisfy its full disclosure obligations. The draft GEIS infers that there is some evidence linking harmful effects of EMF, yet none of this evidence is discussed. For purposes of full disclosure, the biological research should be addressed in the GEIS. In line with this view, a Michigan Public Service Commission representative suggested that the NRC

recognize the considerable amount of research going on in this area. The OCRE felt that the GEIS's treatment of this issue is flawed, yet believes that the NRC should hold off on making any generic findings regarding the health effects of EMF until there is more study and research. The State of Vermont commented that until EMF effects from transmission lines are completely understood, the issue should be classified as Category 3. In addition, a representative from the Risk Analysis Corporation expressed concern that neither the private sector nor the Federal government is moving quickly to establish standards for the control of public exposure to power frequency electric and magnetic fields. There are no occupational standards in this area, and the Federal policy which exists is uneven. While the NRC in its draft EIS decided that applicants need not address the issue of chronic effects of EMF in license renewal applications, other agencies, such as the Bonneville Power Administration, the FERC, and the Rural Electrification Administration, have taken specific positions on this issue.

Response: The NRC will continue to monitor the research initiatives, within the national EMF program and others internationally, to evaluate the potential carcinogenicity of EMF as well as other progress in the EMF study disciplines and will perform periodic reviews. Because of the uncertainties on the chronic effects of EMF on human health (the state of science being inadequate), the issue of chronic human health impacts cannot be categorized as either a Category 1 or 2 at this time. If the NRC decides that this issue is sufficiently important, all license renewal applicants will have to address it in the license renewal process.

Concern Nmbr: HHI.011
Topic: Human Health Impacts
Subtopic: Microbiological organisms
Associated Comment Nmbr(s): W04.016
Concern: Although he believes that the proposed rule is very good, a Michigan Consumer Power representative noted that the description in the rule concerning thermophilic organisms in Section 51.53(c)(3)(ii)(H) needs clarification. In that section, the words present in most of the other paragraphs—"due to license renewal"—are not present. Although *naeglaria* and related concerns were not covered in the initial EISs for most plants, they have been dealt with at many plants. If action has been taken by the time of the license renewal application, this should be considered and included in the rule even though the number of plants affected is small. This would be more consistent with the rest of the rule.

Response: The NRC agrees. The text in Section 4.3.6 of the GEIS has been revised to require consultation in instances where *naeglaria* and related concerns have not been addressed in previous environmental documents.

Concern Nmbr: HHI.012
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W04.017
Concern: A Detroit Edison representative pointed out that the GEIS projects doses associated with continued operation and with refurbishment activities to remain within the same range as has been experienced in the last decade. He believes this may be a conservative estimate. First, there

is an accumulation of experience and lessons learned when tasks are repeated, such as steam generator and recirculation piping replacements. Typically, procedures and technologies are improved; in fact, doses go down over time. In the last five years after implementation of the Three Mile Island (TMI) modifications, doses have consistently come down on an average level for individual workers as well as on a collective level for all workers. Secondly, there is increasing emphasis in the U.S. nuclear industry to follow a trend which has been in place for some time in Europe and Canada to reduce the overall source term for nuclear power plants. If these efforts continue, one should expect that, over time, the level of radiation and amount of radioactivity in the nuclear plants will be reduced, especially in the longer term.

Response: The NRC agrees that worker radiation doses have been steadily decreasing. This fact is noted several times in the GEIS. However, the human health impact assessments in the GEIS are based on current technology, not projections of possible future technologies. Even with current technology, projected radiation doses result in very small impacts.

Concern Nmbr: HHI.013
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 038.020
Concern: The MDNR suggested that the GEIS emphasize that doses reported in the referenced documents (Section 4.6.2) are all based on measured releases and offsite dose modeling consistent with the model described in Regulatory Guide 1.109. Additionally, it is not possible to accurately detect incremental offsite doses on the order to 1 to 3 millirem per year with actual offsite dose measurement, and these small incremental changes can only be estimated by calculations based on releases measured at their source.

Response: The NRC agrees with the comment.

Concern Nmbr: HHI.014
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 038.024
Concern: The MDNR pointed out that in interpreting risk estimates, it is important to remember that collective doses which result from the exposure of very large groups of people to extremely small individual doses permit calculation of numerical health risk estimates that are purely theoretical. Current epidemiological methods are not adequate to isolate and quantify health effects associated with an increase in annual dose of only a few percent; therefore, it seems unlikely new evidence will ever exist to demonstrate adverse health effects resulting from environmental doses associated with LWRs. (NUREG-1437, Vol. I, Section 4.8.5)

Response: The NRC agrees with the comment.

Concern Nmbr: HHI.015
Topic: Human Health Impacts
Subtopic: Electromagnetic fields impacts
Associated Comment Nmbr(s): 501.004
Concern: A representative of the Risk Analysis Corporation referred to a statement in the GEIS on page 4-59, line 17 et seq.: "If and when there is a Federal law limiting human exposures to electric and magnetic fields, EPA will promulgate the regulation." To commenter's knowledge, the EPA has no legislative authority to do this. The EPA could use authority it inherited from the Federal Radiation Council in 42 U.S.C. 2021(h) to provide guidance to other Federal agencies as it did, for example, in the case of radon exposure of uranium miners. This section of the Code reads: "The Administration shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States." Each Federal agency, however, would have to implement the guidance; EPA has no direct implementing role. Likewise the DHHS could invoke the Radiation Control for Health and Safety Act and treat transmission lines as "electronic products", and write performance standards for the lines analogous to the leakage standard for microwave ovens. However, the DHHS has historically deferred to other Federal agencies, such as the Federal Communications Commission and the EPA, to take the lead for regulation of environmental sources of non-ionizing radiations.

Response: The NRC agrees with the comment. The GEIS text in question has been modified to reflect the existing uncertainty as to which Federal agency would have jurisdiction for any future laws limiting public exposures to electric and magnetic fields. The EPA is, however, reviewing the data currently available regarding this issue.

Concern Nmbr: HHI.016
Topic: Human Health Impacts
Subtopic: Safety standards
Associated Comment Nmbr(s): 044.001 085.005
Concern: A private citizen argues that Federal standards for radiation and safety are less strict than those of the States, and that the State standards should prevail. Another individual said that the requirement to allow State-licensed LLW disposal sites to "leak" at Federally-accepted levels, rather than at more protective levels, should be eliminated.

Response: In NRC's oversight of Agreement State programs under current policy, the Commission expects Agreement States to adopt, in most cases, standards identical to those of the NRC's. Such standards include those for release of radioactivity at LLW disposal facilities provided in 10 CFR 61.41.

Concern Nmbr: HHI.017
Topic: Human Health Impacts
Subtopic: Health effects of alternative fuels
Associated Comment Nmbr(s): 079.013
Concern: The State of Vermont indicated that the radiological evaluations from Sections 4.6, 4.8, 6.3, and 6.5 are performed in a manner which specifically obscures the central issue of the NEPA evaluation, which is an environmental preferability determination between radiological impacts of nuclear plants versus the environmental impacts of alternatives. Each of the GEIS sections identified above uses established NRC mechanisms to declare various radiological impacts as insignificant. This fractioning avoids the conclusion that license renewal radioactivity would result in real health impacts and real irretrievable resource commitments which may clearly be less preferable than alternatives. Because the radiological impacts in these sections are only valid in comparison with alternatives, and because alternatives are plant-specific, the radiological conclusions of these sections must be determined as Category 3, and must be reserved for specific plant applications.

Response: In the final GEIS, NRC staff modified the approach to the comparative analyses of alternatives. The purpose and need statement of the final rule states that "the proposed action (renewal of an operating license), is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers."

In view of the above, NRC staff characterized alternative energy sources as alternatives to license renewal, and not as the consequences of the "no action" alternative. Furthermore, the consideration of alternatives will be done as part of the site-specific review. The final rule does not contain any information or conclusions regarding the environmental impacts of alternative energy sources. The GEIS, however, contains a discussion of the environmental impacts of alternative energy sources based on currently available information. The NRC will make conclusions regarding the comparison of license review renewal to other alternatives at the site-specific stage.

Concern Nmbr: HHI.018
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 043.001
Concern: The FCSE argues that the license renewal evaluation process should include a study of the health effects on the public residing near a nuclear power plant.

Response: The NRC believes that a study of the health effects on the public residing near a nuclear power plant as part of a license renewal evaluation is not warranted. A comprehensive study by the NCI, *Cancer in Populations Living Near Nuclear Facilities*, July 1990, NIH Publication No. 90-874, found no increase in cancer mortality.

Concern Nmbr: HHI.019
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.050
Concern: The EPA noted that Section 3.8.1.5 (p. 3-32) refers to the offsite doses due to refurbishment activities as being comparable to the doses from routine operation. Some discussion is needed of the potential releases of hot particles, which can deliver relatively high localized dose rates. During routine operations, offsite exposures to hot particles are unlikely. However, hot particles can be generated during refurbishment activities and should be addressed.

Response: The statement quoted by the EPA refers to Tables 3.11a and 3.11b of the draft GEIS, comparing the measured effluents of operating reactors during major refurbishment activities and normal operations. Any release of hot particles during these periods is included in the data and the conclusion is still valid. Hot particles are discrete contamination particles of relatively high radioactivity content. These hot particles are negligible effluent and public dose concern. Due to their relatively large size and activity, the effluent processing (filtration) and monitoring in place at nuclear power plants is generally effective in preventing their release offsite through effluent streams. One plant (Sequoyah, 1994) has experienced the release of hot particles from their Auxiliary Building through an unfiltered vent. However, the particle size of the hot particles caused them to settle out on the roof of the building with no offsite release detected.

Hot particles are generally an onsite worker safety concern. Contamination control measures required by the plant's radiation protection program are implemented to prevent the unnecessary exposure to, and spread of, radioactive contamination, including hot particles. There is no evidence that the potential for releasing hot particles offsite is higher during refurbishment activities than during normal operations. Major refurbishment activities involving cutting or grinding on radioactive systems are provided with containment devices to control the contamination (including any hot particles) that may be generated. In the reactor facilities that have experienced the most significant problems with hot particles to-date, the source of the hot particles has been normal reactor operations with degraded, leaking fuel.

Concern Nmbr: HHI.020
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.051
Concern: The EPA noted that on page 3-31, the GEIS states that the somatic and genetic risk estimators used were the ones employed by the NRC in the *Federal Register* notice promulgating the new NRC "BRC" policy. It should be noted that the NRC has deferred actions on petitions for rulemaking that deal with "BRC" in order to initiate a "consensus building process." This resulted from the onslaught of adverse criticism that this concept generated. Therefore, the EPA believes the use of this policy in conjunction with risk estimated from radiation exposure is inappropriate.

Response: The NRC agrees and the reference to BRC is deleted.

Concern Nmbr: HHI.021
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 087.052
Concern: The EPA noted that the conclusion on page 3-42 that the "upper-limit cancer and genetic risks from radiation exposures attributable to refurbishment were compared with natural incidence and found to be much less than 1 percent of the natural background rates" is not very reassuring. The natural incidence of fatal cancer is 1 in 5, and the natural incidence of serious genetic effects is about 6 percent of all births. In addition, cancer and genetic effects are not necessarily "natural." At least a portion of the incidence is likely due to anthropomorphic sources of environmental mutagens. The EPA concurs with the conclusion that occupational exposures are Category 1, but believes that it is difficult to conclude that the exposures are small. A 1 percent chance of acquiring cancer is not small. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishes that a negligibly small lifetime risk of cancer is in the range of 1E-06 to 1E-04.

Response: Comments are well taken. The text has been modified to reflect the fact that occupational doses are at present considered acceptable and they will remain to be within regulatory limits during refurbishment.

Concern Nmbr: HHI.022
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 087.053 087.054
Concern: The EPA noted that the occupational and public doses associated with refurbishment and replacement activities, as listed in Table 2.6 (p. 2-31), have been assigned to Category 1. The EPA questioned how the license renewal process would proceed if the applicant plans on activities that include replacement of the pressure vessel, or some other relatively intrusive activity. A review of operating experience associated with major component replacement reveals occupational doses from steam generator repairs as high as 3,500 person rems, and requiring 872,000 work hours and a 10-month outage. The exposures and outage duration are somewhat higher than those in Table 2-7 (p. 2-33). The EPA noted that though the exposures are generally consistent with the literature, they do not appear to be bounding (i.e., Category 1).

Response: The NRC considers the replacement of steam generators at PWRs and recirculation piping at BWRs to be highly intrusive. They are the largest events considered in this GEIS. (Pressure vessel replacement is outside the bounds of this GEIS.) Information presented in Appendix B and in Section 2 includes tabulations of actual duration, cost, labor, and doses for such activities. For example, the most recent replacement at North Anna 1 was completed in 51 days with a collective dose of just over 200 person-rem (Atom 428: pp. 8 and 9, 1993.) The scenarios developed for the major refurbishment outages are described in Appendix B. The NRC considers that these scenarios and their consequences conservatively bound activities which would be applicable to the majority of plants. The intent of this GEIS is to bound the majority of activities. Pressure vessel replacement was not considered in the relicensing scenario of this GEIS. If pressure vessel replacement is part of a license renewal application, then occupational

and public doses will be reexamined. Within the scope of this GEIS, this issue remains Category 1.

As is the case with many procedures, the first experience is usually the worst. The NRC policy with respect to the GEIS is to evaluate the proposed action based on reasonable assumptions and scenarios, not "worst case." The NRC's review of steam generator repairs has determined that the first several procedures were of long duration and resulted in high cumulative doses. However, advances in pre-cleaning technology, as well as health physics procedures, have resulted in considerable reductions in occupational dose in the last few steam generator replacements. The analysis does not take advantage of future advances in dose reduction, but does tier from present experience.

Concern Nmbr: HHI.023
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 087.057 087.058 087.067
Concern: The EPA noted that the GEIS reference to "relatively high collective occupational doses" on page 3-39 should be quantified, and the scenarios under which this would occur defined. Since the man-rem dose levels are already diluted by a high number of low-level radiation workers who rarely receive any dose at all, it seems that the actual doses to the "real" radiation worker are not accurately reflected. The GEIS also assumes that the risk is small by providing exposure results from the nuclear industry. But these numbers are not realistic because they include a high number of personnel who are considered radiation workers, as well as support personnel, who all wear dosimeters, but rarely receive any significant dose. Thus, the actual cancer risk to "hard core workers" is higher than that suggested by the GEIS. Finally, the GEIS should address the possibility that the declining average annual occupational dose rates (Table 4.10) may be due, in part, to the practice of badging an increasing number of site personnel, even though many of them have little potential for exposure.

Response: The NRC's analysis of collective occupational dose (greater than 0.1 mrem per individual) during current operations suggests that an approximate doubling of current average annual dose levels is a possibility at any given plant during a period of unusual repairs or modifications, such as occurred during the post-TMI plant modifications. Tables presented in the text and Appendix E demonstrate that (for 1992) approximately 5 percent of the workers in the nuclear utility industry receive whole-body doses between 1 and 2 rem, 0.4 percent between 2 and 3 rem, 0.02 percent between 3 and 4 rem, and 0.003 percent between 4 and 5 rem, and none above 5 rem. The number of people in the high dose groups has decreased steadily. Data from 1992 may be contrasted with those from 1980: 8 percent of the workers received between 1 and 2 rem, 3 percent between 2 and 3 rem, 1 percent between 3 and 4 rem, 0.5 percent between 4 and 5 rem, and 0.2 percent between 5 and 10 rem. Because of the continuum of radiation exposures among radiation workers, with persons having the potential for radiation exposure daily, monthly or yearly, the NRC has provided available data in a variety of forms, both within the text and within Appendix E. The NRC has not identified a better way to portray actual doses to "hard core" radiation workers.

Within the GEIS, every attempt has been made to accurately portray doses and risks. Table 4.11 provides a breakdown of number of persons versus dose rate interval for the year 1992.

Aggregated information presented in Table 4.10 must be considered in light of other data, such as those presented in Tables 4.7, E.6, and others. The number of persons at the average nuclear plant with measurable dose has varied between about 600 and 1,200; it is currently about 1,000. Analysis of the data suggests that both the average annual occupational doses and the cumulative annual occupational dose are decreasing.

Concern Nmbr: HHI.024
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.060
Concern: The EPA noted that the population doses from routine emissions are somewhat misleading because they do not account for the complete environmental dose commitment from very long-lived emissions, e.g., C-14. The environmental dose commitment from C-14 alone is about 4,000 person rem/yr/plant. The data presented in Tables 4.7 and 4.8 do not appear to include this.

Response: The determination of dose commitments out to 50 miles from routine emissions is standard NRC practice. The GEIS has been modified to explain that the calculation and explanation of the consequences of dose commitments beyond 50 miles is highly speculative because of inaccuracies in meteorological models and of extremely small individual doses.

Concern Nmbr: HHI.025
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.061
Concern: The EPA asked how the cooling tower drift affects the dispersion and deposition of the atmospheric discharge of radioiodines and particulates.

Response: Like fog, cooling tower drift mainly provides an indication of where the wind is blowing. Except for highly soluble materials, this drift is not expected to materially affect the dispersion of gaseous effluents. Tritium as tritiated water vapor is the major soluble radioactive effluent. Attaching to large water particles may enhance the deposition slightly; however, the tritiated water exchanges with normal water vapor in the air so fast that such effects are considered to be of scientific interest in the area of water movement, but unimportant to radiation dose issues.

Concern Nmbr: HHI.026
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.064
Concern: The EPA noted that the discussion of trends on page 4-80 may be misleading. It is probably more appropriate to assume that routine release rates will remain fairly constant during the license renewal period.

Response: The intent of the analysis was to determine if there was any evidence present in available records which could support the prediction of trends. It seems that this might be the case for specific categories of reactors. However, the NRC analysis does not take credit for any future improvements in release rates. The position taken is exactly that recommended in the comment, namely to assume that the routine release rates will remain fairly constant during the period of license renewal.

Concern Nmbr: HHI.027
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 087.066
Concern: The EPA noted that the discussion in Section 4.633, page 4-85 and page 10-2 should also point out that the doses from internal emitters are a very small fraction of the reported external doses, and that the doses are predominantly from low-linear energy transfer (low-LET) radiation. This has significance in terms of assessing the risks from exposures.

Response: In Appendix E, Section E.3.1.1, a discussion on the relative contribution of internal emitters is presented. Additionally, Tables E.9 through E.11 contain data supporting the text. The NRC does not agree that the very general statements on pages 4-85 and 10-2 are improved by a reference to internal emitters.

Concern Nmbr: HHI.028
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 087.068
Concern: The EPA noted that reference is made to the low dose rates associated with occupational dose, which are likened to the exposures to background radiation (p. 4-84). This is somewhat confusing because, unlike exposures to background radiation, occupational exposures are delivered at relatively high dose rates (i.e., mrem/hr to rem/hr).

Response: The GEIS text has been modified slightly to remove the sentence about uncertainty in the dose rate effect. The NRC agrees that there is a theoretical issue relative to the effectiveness of high versus low dose rates. However, as a practical matter, having reviewed the dose rate effectiveness factor discussions in Biological Effects of Ionizing Radiation (BEIR V) report and the National Council on Radiation Protection and Measurements' (NCRP) Report No. 64, *Influence of Dose and its Distribution in Time on Dose-Response Relationships for Low-LET Radiations*, and given the range of doses and dose rates under discussion, the NRC considers that

dose rate effects in occupational dose situations do not materially affect the comparisons described in Section 4.6.3.2. The dose rate effectiveness factor is discussed in Appendix E.4.

Concern Nmbr: HHI.029
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 054.049 079.012 087.049 087.098
Concern: The EPA noted that the risk coefficients provided in Table 3-10 (p. 3-32) are somewhat misleading. The table states that the range of the risk of fatal cancer is 0 to 4E-04 per rem for occupational exposure and 0 to 5E-04 per rem for public exposure. Similarly, the EPA noted that Section 5.2.1.4 of the GEIS states that, based on information compiled by the United Nation's Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the National Academy of Sciences (NAS), and the International Commission on Radiological Protection (ICRP), the risk estimates for fatal cancers range from 0 to 500 per million person-rem. This is incorrect. The 90 percent confidence limits given in BEIR V are 500 to 1,200 additional fatal cancers per 100,000 people for exposure to 10 rem, and risk coefficients possibly a factor of two lower for exposure at low doses and dose rates.

The MDPS believes that the NRC arbitrarily chose a risk coefficient of cancer fatalities per 10,000 people, each exposed to 1 rem (see Table 3.10). MDPS noted that the most authoritative risk estimation values appear in the 1990 BEIR V report, which shows 800 cancer fatalities among 100,000 people receiving an instantaneous dose of 10 rem. Moreover, in Table 3.9, the NRC presents a current design objective for annual dose limits to the general public of 1.8 mrem/year for total body exposure, but it retains for regulatory purposes a dose limit of 25 mrem/year. In order to attain EPA's risk level goal of 1 in 10,000, and using the BEIR V estimates of cancer fatalities, the dose rate limit would be 1.8 mrem/year, as compared with NRC's 25 mrem/yr dose limit and EPA's 10 mrem/year dose limit. Neither the NRC's nor the EPA's limits approaches the Minnesota criterion of 0.054 mrem/year.

The State of Vermont commented that the results of BEIR V and other recent studies indicate a high probability that acceptable radiation standards will be lowered, and that the health effects are greater than considered in present standards. Therefore, the issue should be classified as Category 3.

Response: The text of Section 5.2.1.4 has been modified to be more clear. In Table 4.2 of BEIR V, an instantaneous exposure causing a dose equivalent to all body organs of 0.1 Sv (10 rad of low-LET radiation), varying the age at exposure by 10-year intervals and taking the population weighted average of the resulting estimates, weighted by the probability of surviving to a specified age in an exposed stationary population, yields 90 percent confidence limits for fatalities per 100,000 exposed persons of 540–1,240 for males and 630–1,160 for females. The averages, weighted for the age distribution in a stationary population having U.S. mortality rates, are 770 for males and 810 for females. Application of a dose rate reduction factor for non-instantaneous exposure that could occur during normal operations or during a reactor accident reduces these average figures. The generally accepted value for non-instantaneously exposed populations is 500 cancer fatalities per million person-rem.

Concern Nmbr: HHI.030
Topic: Human Health Impacts
Subtopic: Uranium fuel cycle
Associated Comment Nmbr(s): 087.076
Concern: The EPA believes that natural background radiation is not a good criterion for concluding that the impacts of the uranium fuel cycle are small. The emphasis should be on impacts relative to the currently feasible alternatives, as summarized in Tables 9.1 and 9.2.

Response: The NRC agrees with the comment. It was not the intent in the GEIS to have a comparison of radiological impacts to background radiation be the primary criterion for concluding that the impacts of the uranium fuel cycle are small. In fact, a comparison to background levels is not even made within the text in Chapter 9 of the draft GEIS. The references to background radiation in Table 9.1 have been removed, and the text of the GEIS has been modified to emphasize that the determination of the impact of the uranium fuel cycle being small is the cumulative result from each of the environmental impact areas addressed in new Tables 8.1 and 8.2. The uranium fuel cycle is considered safe today, and license renewal is not expected to change that fact. Tables 8.1 and 8.2 provide a comparison of the environmental impacts of constructing and operating 1,000 MWe-equivalent electric power plants in terms of land use, ecology, aesthetics, water and air quality, waste, human health, and socioeconomic and cultural resources.

Concern Nmbr: HHI.031
Topic: Human Health Impacts
Subtopic: Uranium fuel cycle
Associated Comment Nmbr(s): 087.077
Concern: The EPA recommended that the impacts from radon emissions from the fuel cycle be expressed in terms of person working level months (WLMs), in addition to dose, since the risk coefficients for exposure to radon progeny are correlated to exposures expressed in WLMs.

Response: The units for the activities and the risk factors used in the GEIS are curies and cancer fatalities per million man-rem, respectively. They are consistent with the NRC's approach for deriving Table S-3 (in 10 CFR 51.51).

Concern Nmbr: HHI.032
Topic: Human Health Impacts
Subtopic: Uranium fuel cycle
Associated Comment Nmbr(s): 087.078
Concern: The EPA noted that the NRC's assessment of the public health impact of its fuel cycle operations is incomplete and is currently the subject of a rulemaking that will be concluded after the GEIS is completed. The revision of Table S-3 should be completed before the GEIS is completed and reviewed along with the GEIS.

Response: The Table S-3 rulemaking is a medium priority rulemaking and is progressing, but currently has no official schedule.

The revised Table S-3 is currently using revised health risk coefficients and will be using the most current estimate at the time it is published. The analysis of uranium fuel cycle impacts in the GEIS has been updated to include information currently not presented in the S-3 rule.

Concern Nmbr: HHI.033
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 087.079
Concern: The EPA noted that the doses and risks associated with the management of HLW and LLW should refer to the generic analyses performed in support of 10 CFR Parts 60 and 61. For HLW, the design criterion is 10 effects per 10,000 years per 1,000 metric tons of initial heavy metal.

Response: The doses and risks associated with the management of HLW and LLW are referred to in the explanation to the new Table S-3, anticipated to be published as a proposed rule in 1995. The estimates in the new Table S-3 were based on compliance with the requirements in 10 CFR Parts 60 and 61. The estimates in the old Table S-3, referred to in the GEIS, have not changed significantly with respect to the management of HLW and LLW.

Concern Nmbr: HHI.034
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 087.099
Concern: The EPA noted that on page 5-3, line 7, it is stated that the principal radiological hazard associated with the accidental release of radioiodines is from ingestion. Inhalation is of greater concern than ingestion, as is external whole body exposure.

Response: The text in the GEIS has been modified to remove the statement that the principal radiological hazard associated with the accidental release of radionuclides is from ingestion.

Concern Nmbr: HHI.035
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.045
Concern: The State of Minnesota noted that of the 62 issues that involve human health, the NRC concluded that 49 issues could be addressed generically for all plants and the remaining 13 could be addressed generically for all but a subset of plants. It disagrees with the following NRC assumptions: (1) that no new information of relevant significance will be available in the coming years to change the GEIS assumptions; and (2) that there are no specific sets of circumstances pertaining to particular generating plants, or their location, which are relevant to human health or health risk assessment.

Response: Minnesota misunderstood the NRC assumptions.

1. The analyses were made using current knowledge. It is implicit that major changes in health effects data could require future reanalysis because conclusions would be based on information then known to be incorrect.

2. Specific circumstances are currently reflected in on-going monitoring/dose assessments. These dose assessments have resulted in acceptable levels, hence plants can and have maintained their operating licenses. In terms of refurbishment and license renewal, no major changes from current practice are envisioned, hence there are no major changes from current operating dose levels to the public.

Concern Nmbr: HHI.036
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.046
Concern: The State of Minnesota contends that the GEIS conclusion that the health impacts of license renewal are acceptable on the basis of a cost-benefit analysis is flawed. Changes in technology and power needs will impact the cost-benefit analysis for health risks. Low public tolerance of health risks from nuclear plants may further decline in view of the Federal government's inability to develop a HLW storage facility. Issues related to technological advances, power needs, and siting of waste storage facilities, as they relate to health cost-benefits and public tolerance to health risks can be adequately addressed only in a site-specific EIS.

Response: The NRC has eliminated all cost-benefit conclusions from the GEIS and has determined that its license renewal NEPA decision will be based on a consideration of the environmental impacts of a renewed license compared with the environmental impacts of a range of reasonable alternatives. The ultimate NEPA decision will be made at the site-specific application review, and will be based on the analysis of environmental impacts presented in the GEIS (as supplemented by the applicant) as well as on any new and significant information provided by the public during the public comment period for the draft SEIS.

Concern Nmbr: HHI.037
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.047
Concern: The State of Minnesota noted that the GEIS and proposed rule have not considered Minnesota's position regarding dose-rate limits and public exposures, as required by NEPA. In addition, the MDH believes that equivalent health risk criteria must be used to compare health risks posed by alternative methods of power generation. The MDH has calculated an upper-bound lifetime cancer incidence risk coefficient for exposure to ionizing radiation and has applied its negligible risk criterion for exposures to such radiation. Risk coefficients for chemicals and radiation are used by the MDH to obtain upper-bound risk estimates of cancer incidence. In contrast, the NRC's risk coefficients provide best or central estimates of cancer mortality.

Response: The NRC does not agree with this comment. In making comparisons of alternatives, comparisons of the central or best estimates of impacts provides the fairest determination. Worst-case or conservative estimates can distort the comparisons and lead to poor decisions.

Concern Nmbr: HHI.038
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 054.048
Concern: The State of Minnesota noted that the NRC policy regarding cancer risk calculation and dose rate limits is changing. However, the NRC ignores the importance of these changes by failing to include in the GEIS and proposed rule a mechanism for revising the dose limits as new data become available or as societal views regarding acceptable risk evolve. The NRC also ignores its own most recent data in determining dose rate limits and risk estimates.

Response: The GEIS is written using current, NRC-approved risk estimators and dose limits. New recommendations from the ICRP and others do not significantly affect the conclusions in the GEIS. If the NRC policy on risk estimates were to be revised, then the rule and the GEIS would be reviewed to determine if the policy change necessitates a change in the findings.

Concern Nmbr: HHI.039
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 038.027
Concern: The MDNR believes that the estimate for annual occupational dose attributable to all phases of the uranium fuel cycle is too low. Additionally, it is inconsistent with infomation provided in Table 3.12 (NUREG-1437, Vol. I, 4.8.7).

Response: The NRC agrees with the inconsistency identified in this concern. The new Table 3.11, "Annual Average Occupational Dose for U.S. Licensed Light Water Reactors," indicates an annual average in excess of 600 man-rem. The GEIS text has been revised accordingly. It is still accurate to say that this occupational dose will have little environmental impact.

Concern Nmbr: HHI.040
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.051
Concern: The State of Minnesota noted that Table E.19 on airborne emissions does not have any data for the Monticello or PI nuclear plants. Before either plant is relicensed, such data should be made available as part of an environmental review process, and evaluated with respect to the Minnesota dose rate criterion of 0.054 mrem/year.

Response: The NRC does not agree with the comment. The particular information cited is not necessary for inclusion in the GEIS because of the bounding estimates of exposure that were used.

Airborne emission information for each specific plant is available from sources outside the GEIS for review and evaluation at any time.

Concern Nmbr: HHI.041
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.052
Concern: The State of Minnesota noted that Table 3.11b contains data for a few BWRs, including Monticello, on air and liquid releases of radionuclides. Before relicensing, data of this type need to be evaluated in terms of possible impact on farming activities and food chain exposures in the areas surrounding the Monticello and PI plants. Additionally, the statement, "The significance of any given nuclear power plant to its host area will depend to a large degree on its remoteness . . ." may not be accurate (GEIS, p. 2-25). The potential impact of effluent releases is greatest in farming areas where food chain exposures to radionuclide emissions may occur. Further analysis of this issue must occur during individual plant relicensing.

Response: Doses associated with effluent releases are calculated in accordance with Revision 1 to Regulatory Guide 1.109, "Calculation and Annual Doses to Man from Routine Releases of Reactor Effluent for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I." These calculations include the many effluent pathways described in Section 3.8.1.2 of the GEIS. The NRC does agree that the statement quoted may be inaccurate, and the term "remoteness" has been changed to "location" on page 2-25.

Concern Nmbr: HHI.042
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 081A.002 085.002
Concern: The NIRS and a private citizen are concerned about the proposed Part 51 rule conclusion that radiation exposure to the public has a small impact (Table B-1, p. 47031). A study done by a State public health agency of the Pilgrim nuclear power plant concluded that adults living and working within a 10-mile radius have a 4-times greater risk of contracting leukemia. These types of issues need to be challenged at license renewal hearings.

Response: The commenters refer to the "Southeastern Massachusetts Health Study 1979–1986," performed by the Massachusetts Department of Public Health (MDPH). NRC staff reviewed this study and found it deficient in several respects. The MDPH study has also been contradicted by the NCI study, *Cancer in Populations Living Near Nuclear Facilities*, (July 1990). The NCI epidemiological study "found no suggestion that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancer . . . ." This study included 52 nuclear power plants (including Pilgrim) and examined county statistics for 2.7 million individuals who died of cancer. The findings of the NCI study are consistent with the findings of several similar epidemiological studies in foreign countries and with the latest conclusions of expert bodies, such as the National Research Council's Committee on the Biological Effects of Ionizing Radiation. The NRC bases its assessment of the health effects of ionizing radiation on the overall body of

scientific knowledge and on the recommendations of expert groups such as NAS, NCRP, ICRP, and UNSCEAR.

Concern Nmbr: HHI.043
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 038.011
Concern: The MDNR pointed out that the identification and monitoring of all significant pathways, as referenced in Section 3.8.1.2, should be done to ensure that the effluent information used in the calculation of offsite doses is as current and as accurate as possible. It cited that when plants are designed, there are specific effluent pathways that are identified based on plant design and intended operation. Plant modifications or refurbishment may alter the configuration of existing effluent pathways, eliminate some pathways, or create new ones.

Response: Not all possible radionuclide transport pathways are applicable to each nuclear facility. For example, the cow-milk-human pathway is not relevant if no milk producing cows are impacted by plant operations. To meet the regulatory requirements of Appendix I to 10 CFR Part 50, nuclear power plants must monitor all radioactive effluents and quantify the releases. Based on this information, the doses to members of the public are calculated for all applicable environmental pathways using the models in Regulatory Guide 1.109. Each facility is also required to periodically ensure that there are no unmonitored radioactive effluent pathways resulting from the types of plant modifications noted in the comment. In addition, periodic land-use surveys are required to ensure that all applicable environmental pathways are included in the dose calculations.

Concern Nmbr: HHI.044
Topic: Human Health Impacts
Subtopic: Occupational exposure
Associated Comment Nmbr(s): 038.014
Concern: The MDNR agrees with the GEIS conclusions in Section 3.8.2.2. However, it pointed out that occupational exposure may vary even more greatly for refurbishment activities than has been observed for major reactor overhauls to date. Additionally, these exposures are dependent on reactor type.

Response: The NRC agrees that occupational dose may vary more for refurbishment than for observed major reactor overhauls, and that doses are dependent on reactor type. Both of these conditions were factored into the analysis which estimated both conservative doses and typical doses expected to be incurred in refurbishment.

Concern Nmbr: HHI.045
Topic: Human Health Impacts
Subtopic: Public exposure
Associated Comment Nmbr(s): 038.017
Concern: The MDNR pointed out that an equation is improperly referenced on page 4-73, line 27 of the GEIS. The following is suggested:

Change From: $(1-e^{-r})$ To: $(1-e^{-\lambda t})$

Additionally, it pointed out that the statement that tritium represents the greatest dose contributor from liquid effluents is not correct in all cases for marine or estuarine LWR sites. Quantities of tritium produced in a PWR exceed comparable sized BWR production by an order of magnitude. Where liquid waste is discharged into potable water supplies, tritium may contribute the greatest amount of whole body dose; however, where plant discharges are in non-drinking or irrigation waters, radionuclides of cobalt, manganese, or silver are the principal dose contributors, and the pathway for these contaminants is via ingestion of seafood. Further, the MDNR pointed out that site-specific data should be used to accurately quantify these impacts and highlighted some site-specific variances.

Response: The MDNR is correct in that the equation on page 4-73, line 27 of the GEIS is improperly referenced. The GEIS has been changed as per the MDNR's suggested correction. Regarding the second point about liquid effluent dose contributors, the MDNR is correct when considering doses to maximum individuals from liquid effluents. However, tritium is usually controlling for population doses for LWRs. The doses under consideration are extremely small. The dose to the maximum individual from any plant is less than 3 mrem/year (controlled by Appendix I, 10 CFR Part 50) and total population dose from liquid releases from all nuclear power plants is about 70 person-rem year. The GEIS has been modified to estimate an upper-bound dose for liquid releases that conservatively envelopes all of the plants. Since the public risk and the potential environmental impacts from such releases would be extremely small, this approach is more reasonable than requiring site-specific estimates for each plant as suggested by the MDNR.

Concern Nmbr: HHI.046
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 038.018
Concern: The MDNR believes that bioaccumulation factors need to be adjusted for actual site conditions in the evaluation of impacts prior to and after refurbishment. It emphasized that the use of field-derived site-specific data is the only way to accurately quantify radionuclide uptake and estimate associated environmental impacts. Additionally, the bioaccumulation factors reflect a database generated in the late 1960s and 1970s.

Response: The NRC considers the bioaccumulation factor provided in Regulatory Guide 1.109 as sufficiently accurate to estimate the radionuclide transport in the environments surrounding nuclear power plants. The conservative nature of the factors in the Regulatory Guide provide a bounding estimate of the radiological impact. Any increased accuracy or precision gained by "field-derived

site-specific data" would not justify the expense of the complex studies that would be required for each plant.

Concern Nmbr: HHI.047
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 038.019
Concern: The MDNR pointed out that the GEIS analysis in Section 4.6.1.2 is not completely accurate for all plant designs. Most BWRs do not have completely shielded secondary systems, and therefore, contribute some measurable dose to a site boundary that may be less than 800 meters away. In addition, the use of hydrogen injection to reduce the effect of intergranular stress corrosion cracking has caused substantial increases in dose rates at the contact point with steam containing components and at many locations onsite. In such cases, substantial additional concrete shielding may be needed to ensure that actual site boundary doses remain small fractions of background.

Response: Section 4.6.1.2 has been expanded to include a statement that some plants (mostly BWRs) do not have completely shielded secondary systems and may contribute some measurable offsite dose.

Concern Nmbr: HHI.048
Topic: Human Health Impacts
Subtopic: Radiation exposure-public/worker
Associated Comment Nmbr(s): 079.010
Concern: The State of Vermont indicated that the GEIS should address the potential for new, extensive backfitting requirements as a result of "lessons learned" from a future accident like TMI. The TMI modifications in the early 1980s caused higher occupational dose.

Response: The NRC believes that Appendix E of the GEIS as currently written, adequately describes the history of occupational exposures through the period of the TMI backfitting activities.

Concern Nmbr: HHI.049
Topic: Human Health Impacts
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 038.012 038.016
Concern: The MDNR agrees with the GEIS conclusion in Section 3.8.1.4 that refurbishment activities will not significantly affect the total dose to the general public. However, it pointed out that during the refurbishment year, the total volume and activity of solid waste will be significantly greater than for a normal operating year. Also, in GEIS Section 4.6.1, the text should reference that the main cause of reduced effluents has been improved fuel integrity and better operation of existing radioactive-waste systems. Early BWR systems had defective fuel that was replaced in most cases prior to 1980. Additionally, installation of improved gaseous treatment equipment as a result of 10 CFR Part 50, Appendix I, also significantly reduced both gaseous and liquid releases.

Response: Section 3.8.1.4 discussed the radiation exposure from gaseous and liquid effluents, not solid LLW. Section 3.9 addressed the increase in low-level solid waste production during refurbishment by referencing Section 6.3. The entire subject of solid waste generation associated with license renewal, including the waste generated during refurbishment activities, as well as during the extended plant operation, is analyzed in Section 6.3. The second paragraph in Section 4.6.1 does indicate that the increased effectiveness of radioactive waste management systems is the primary contributor to the noted decreasing trend.

C-8. Topic: License Renewal Scenario (LIR)

License Renewal Scenario (LIR)

Concern Nmbr: LIR.001
Topic: License Renewal Scenario
Subtopic: Refurbishment schedule
Associated Comment Nmbr(s): W02.001 W02.005 W02.006 W02.007 W02.008 W02.010 W02.011 W11.036 032.001 032.002 032.003 032.004 032.005 032.006 032.007 032.008 032.009 032.010 032.011 032.012 063.005
Concern: Representatives from the DOE, VDPS, and YAEC commented that the resulting schedules for refurbishment are unrealistic compared to past experience. Specifically, the commenters stated that anticipating only one major outage prior to license renewal, rather than several minor outages that may extend into the renewal term, results in an overestimation of the refurbishment activities for a particular plant.

Commenters also noted that the refurbishment scenario depicted in the GEIS is too conservative. The YAEC representative expressed concern that the underlying assumptions for the restrictive refurbishment scenario bounds could also impact other issues, such as the direct economic costs of license renewal. NUMARC and NSP indicated that, since NEPA requires reasonable estimates of the environmental impacts of Federal actions, using the upper-bound refurbishment scenario skews the estimates and does not represent reality.

Response: In response to several commenters' concerns that the refurbishment schedules and scenarios were too conservative, the NRC has revised the GEIS to include two types of license renewal program scenarios. The first scenario refers to a "typical" license renewal program and is intended to be representative of the type of programs that most plants seeking license renewal might implement. The second scenario is more encompassing and is intended to be an upper bound of the impacts likely to be generated at any particular plant. The typical scenario is useful for estimating impacts at plants that have been reasonably well maintained and have already undertaken most major refurbishment activities necessary for operation beyond the currently licensed term. The conservative scenario estimates are useful for estimating the maximum impacts likely to result from a license renewal scenario.

The typical and conservative license renewal scenarios characterize actions a licensee may take to assure both safe and economic operation beyond the current 40-year license period. Each plant program and specific refurbishment or repair will depend on many factors, including the original plant design, repairs already undertaken in the original license period, operating conditions and unusual occurrences, and plant management philosophy. The set of actions undertaken for license renewal, therefore, are highly plant-specific and the estimates developed in the GEIS are expected to reasonably bound the impacts that are likely to actually accrue at any particular plant.

Appendix B to the GEIS presents the timelines for each of the renewal scenarios. The NRC recognizes that a typical utility will not attempt to complete all replacement or refurbishment activities during one outage. These scenarios assume that refurbishment and replacement activities are performed in a series of successive outages. The scenarios postulate that one longer outage will be necessary to perform special or unique major refurbishment activities, such as steam

generator replacements. Although the renewal scenarios described in the revised GEIS assume a number of plant outages prior to the license extension period, the NRC acknowledges that other refurbishment and replacement scenarios are possible.

In summary, the NRC acknowledges that some applicants for license renewal will not be required to perfom certain major refurbishment or replacement activities and, therefore, will have fewer or shorter outages. However, the NRC does not consider the two scenarios described in the revised GEIS to be unrealistic or overly conservative in representing the range of activities that could be expected for license renewal and the possible schedule for perfoming the postulated activities.

Concern Nmbr: LIR.002
Topic: License Renewal Scenario
Subtopic: Refurbishment cost
Associated Comment Nmbr(s): W02.002 W02.004
Concern: Representatives from the DOE and the YAEC indicated that Table 2.7 includes reactor vessel annealing as a refurbishment scenario activity. However, the figures generated from Table 2.7 do not appear to include reactor vessel annealing.

Response: The figures in new Tables B.4, B.5, 2.8, and 2.11 are generated from the activities listed in new Tables B.1 and B.2. The figures in the summary tables are identical although the published lists of activities are not. The revised GEIS has updated tables from Appendix B and Chapter 2, so that the tables are consistent. The GEIS has also been revised to include the activities and costs associated with waste disposal.

Concern Nmbr: LIR.003
Topic: License Renewal Scenario
Subtopic: Refurbishment activities
Associated Comment Nmbr(s): W02.003
Concern: An engineering services representative asked how reactor pressure vessel refurbishment and replacement costs were estimated.

Response: The NRC replacement and refurbishment costs for reactor vessels were obtained from the following reports:

1. "Extended Life Operation of Light Water Reactors: Economic and Technological Review," Volumes 1 and 2, EPRI NP-2418, June 1982.

2. "The Longevity of Nuclear Power Systems," EPRI NP-4208, August 1985.

3. S. L. Abbott et al., "Westinghouse Reactor Vessel Life Extension Variance Study," Vol. 1, page 210, in *Proceedings of the Topical Meeting on Nuclear Power Plant Life Extension*, July 31–August 3, 1988, Snowbird, Utah.

Concern Nmbr: LIR.004
Topic: License Renewal Scenario
Subtopic: Refurbishment cost
Associated Comment Nmbr(s): 075.011
Concern: The PSCW expressed concern that units with currently high capacity factors will be forced to raise the cost of power to offset an anticipated increased outage duration due to increased inspection, surveillance, testing, and maintenance (ISTM) activities.

Response: The increased ISTM activities projected to meet license renewal requirements are not expected to increase plant outage time relative to current practice. The increased ISTM activities can be performed by increasing the number of workers onsite during scheduled outages, and the additional work anticipated can be accomplished without lengthening the outages. A few of the ISTM activities might be critical path items, but most could be undertaken in parallel with other outage activities. The duration of the outage is not expected to be longer than it is for current outages, and therefore the NRC believes that cost of power should not increase as a result of increased outage duration. The impact on plant capacity factors, therefore, is expected to be negligible.

Concern Nmbr: LIR.005
Topic: License Renewal Scenario
Subtopic: Refurbishment activities
Associated Comment Nmbr(s): 035.003
Concern: The PDER expressed concern that a licensee's assessment of its own facility's continued safe operation through the renewal term is not reviewed by the NRC. The PDER indicated that a regulatory review should be completed before the licensee integrates its ISTM program into the existing plant activities.

Response: The license renewal rule (10 CFR Part 54) requires a renewal applicant to conduct an extensive evaluation of plant age-related degradation important for the period of extended operation. The results of the evaluation, along with proposed actions for managing the age-related degradation of structures, systems and components (SSCs) during the renewal period, must be submitted in the application for license renewal. The NRC will review the results of the licensee's application, as well as the methods used to conduct the various evaluations and the programs proposed for managing the effects of any age-related degradation. The results of the NRC review will be documented and published in a Safety Evaluation Report.

A renewal applicant, as a result of its own assessment of age-related degradation, may choose to implement some additional activities before the NRC completes its review of the license renewal application. Although the rule does not prohibit a licensee from adding, changing, or enhancing any ISTM activity, the NRC may require further modification to the program(s) after it has completed the review of the renewal application.

Concern Nmbr: LIR.006
Topic: License Renewal Scenario
Subtopic: Refurbishment activities
Associated Comment Nmbr(s): 035.005
Concern: The PDER noted that Table 2.5 presents the activity item "Reactor Pressure Vessel" as requiring volumetric examination of a portion of the beltline welds, whereas a current proposed change to 10 CFR Part 50 will require all licensees to examine 100 percent of the reactor vessel welds, as is specified in the 1989 American Society of Mechanical Engineers (ASME) Code.

Response: The NRC has amended 10 CFR 50.55a, paragraph g, for in-service inspection (ISI) requirements to reference a more recent version of the ASME Code (1989), which requires 100 percent inspection of all beltline welds. It is important to note that improved inspection technology is necessary to perform the proposed 100 percent beltline weld inspections. Until the necessary technological advances can be made, the NRC recognizes that 100 percent inspection of reactor vessel welds may be impractical or impossible. In accordance with 10 CFR 50.55a, paragraph h(g)(6)(i), an applicant may request relief from these requirements, and the NRC may grant relief if sufficient technical justification is provided to ensure that operation would not endanger life or property, or the common defense and security. Therefore, at the present time only some portion of all the vessel welds are regularly inspected.

Concern Nmbr: LIR.007
Topic: License Renewal Scenario
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 035.006
Concern: The PDER stated that the figures cited in Table 2.7 for labor hours, additional onsite personnel, and occupational exposure are substantially low. The commenter cited data from TMI to support this claim. The PDER also stated that the NUREG-1437 waste volumes generated are close to the volume generated by TMI during its 10-year ISI.

Response: The impact driver values shown in the new Tables 2.8 and 2.11 of the revised GEIS are incremental values above those expected from current practices at nuclear power plants. The impact values cited for the recently-completed 10-year ISI refueling outage at TMI represent a baseline measure of current impacts. The figures from Tables 2.8 and 2.11 of the revised GEIS would be added to the baseline values for a total estimate of impacts anticipated at a 10-year ISI outage occurring during the renewal term.

Concern Nmbr: LIR.008
Topic: License Renewal Scenario
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 064.004 064.005 064.008 079.008 079.069
Concern: The UCS stated that the NRC has no basis for a generic estimate of the cost of refurbishment that will be necessary to obtain a renewed license. The UCS asserted that because (1) only 13 of the 111 nuclear power plants that are currently licensed to operate have been in operation more than 20 years, and (2) of those 13 only 2 small demonstration plants have operated for about 30 years, there is insufficient experience with aging plants and no experience with those

operating close to 60 years for the NRC to accurately estimate a generic cost of refurbishment for license renewal across all plants. The State of Vermont suggested that projected costs for refurbishment cannot be estimated with any confidence since the cost of building these plants exceeded expectations by 200 percent. Vermont stated that refurbishment assumptions for both cost and schedule should be plant-specific and be perfomed at the time of the license renewal application.

Response: The NRC has attempted to estimate the reasonable costs of refurbishment as a guide for determining the economic impacts of license renewal. The estimated costs of building nuclear power plants are not analogous to the costs of refurbishments for license renewal. Unanticipated costs incurred during the construction of plants can be attributable, in part, to delays in the actual construction. Similar delays and potential cost overruns are not anticipated with license renewal. However, the estimates do incorporate an escalation factor to account for rising inflation.

The estimates in the GEIS are based on the activities postulated to be necessary for license renewal and were obtained from refurbishment cost data currently available in the published literature. As is stated elsewhere, the NRC will periodically update the information in the GEIS and will revise this information as experience with refurbishment costs for license renewal is gained. Therefore, the NRC believes that the estimates in the GEIS are reasonable estimates at this time.

Concern Nmbr: LIR.009
Topic: License Renewal Scenario
Subtopic: Refurbishment cost
Associated Comment Nmbr(s): 075.010
Concern: The PSCW asked about the life expectancy of replacement steam generators. Specifically, the PSCW wanted to know if steam generator replacement would still be part of plant refurbishment or replacement activities during the license renewal period for steam generators replaced in 1984 (Point Beach 1), 1996 (Kewaunee), and 1997 (Point Beach 2).

Response: Factors that require consideration in determining if and when a steam generator will be replaced include the actual physical condition of the steam generator, the remaining period in which the plant is licensed to operate, and the costs associated with the steam generator replacement. A licensee may not necessarily be required to replace its steam generators simply because it seeks a renewed license. Alternatives to steam generator replacement include shutting down the facility or operating in a derated condition. Therefore, while additional steam generator replacement could be postulated, the staff cannot conclude with certainty that additional steam generator replacements would occur at the plants specifically cited.

C-9. Topic: NEPA Compliance (NEP)

Compliance with 10 CFR 51 and NEPA (NEP)

Concern Nmbr: NEP.001
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Purpose or use of GEIS
Associated Comment Nmbr(s): W04.034 W05.014 W08.025 W12.002 W12.005 W12.008 W12.043 054.011 054.017 060.008 087.004 092.001 092.002
Concern: The following concerns were raised about the purpose or use of the GEIS. The CEQ stated that, based on the *Federal Register* notice and Chapter 9 of the GEIS, which evaluates alternatives to license renewal, the purpose of the GEIS seems to be as support for future decisions on specific license renewal applications, and not as support for the 10 CFR Part 51 rulemaking. The CEQ also maintained that the purpose of the GEIS should be to address, not resolve, environmental issues and to ensure that these issues are identified to the public and the decision maker. Thus, the GEIS should be used as a tiering document, to be supplemented by a site-specific NEPA document for a plant's license renewal. The process should be viewed as an ongoing one in which the GEIS analysis is used when considering each license renewal application.

Likewise, the EPA recommended that site-specific NEPA documents be tiered to the GEIS since the GEIS is being prepared long in advance of the license renewal applications and without detailed disclosure of plant-specific impacts. The EPA believes tiering will give the public an opportunity to identify any new information relevant to Category 1 or bounded Category 2 issues. A process whereby the GEIS is followed by an explicit tying of its findings to the site-specific NEPA document will achieve this.

The State of Minnesota also supported the tiering approach and indicated that the proposed rule fails to tier documents in a manner required by NEPA. Under the definition of tiering (in 40 CFR 1508.28), the GEIS would cover the broader program or policy of relicensing, while the proposed Part 51 with its provision for an environmental review followed by the preparation of either an EA or SEIS would constitute the site-specific statement. At the site-specific level, the NRC's use of tiering the GEIS to a site-specific EA or EIS evades the NEPA mandate to integrate environmental concerns in the agency's plans. The proposed rule eliminates all discussion of Category 1 issues and Category 2 issues for those plants that fall within the bounds. The NRC cannot use the GEIS in the same way as the case of *Baltimore Gas v. Natural Resources Defense Council.* Unlike that case, the GEIS involves 100 environmental issues, not a single issue which affects specific plants. In stating their opposition to the generic approach, the Attorneys General of Minnesota, Connecticut, New York, Vermont, and Wisconsin argued that by using the generic findings made in the GEIS as a basis for codifying by rule the treatment of NEPA issues, the NRC has exceeded its discretionary authority. They also cited the Supreme Court ruling in the *Baltimore Gas* case as a clear example of a generic determination, and one not consistent with the approach used in the proposed Part 51 rule.

Response: In response to the concerns of the CEQ and other commenters, the final rule requires the preparation of a site-specific SEIS for each license renewal proceeding. Pursuant to 10 CFR 51.73, and 51.92(d)(1), a minimum of 45 days would be provided for public comment on the draft SEIS. The NRC will consider the impacts analyzed in the GEIS, as well as the site-

specific impacts analyzed in the SEIS, in its decision making process. In addition, the final rule codifies a summary of the analyses contained in the GEIS on the Category 1 and Category 2 issues. Conclusions will be drawn as to the acceptability of the impacts and mitigation of Category 2 issues upon completion of the SEIS. The NRC will also accept and address comments on the draft SEIS, as well as comments on whether the analyses contained in the GEIS and codified in the final rule are applicable to the plant at issue.

The NRC sees no inconsistency with this final approach and the long line of decisions upholding the generic analysis of environmental impacts, e.g., *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519 (1978); *Baltimore Gas and Electric Co. v. National Resources Defense Council*, 462 U.S. 87 (1985); *Kelley v. Selin*, 42 F.3d 1501 (6th Cir. 1995). In particular, the NRC does not believe that the decision in *Baltimore Gas and Electric* prohibits the preparation of a generic environmental analysis for activities involving a large number of environmental impacts. The NRC believes that the fact that license renewal involves a large number of different impacts does not, in itself, limit the NRC's ability to conduct an adequate generic analysis of such issues. As is apparent by the categorization of issues in the final rule, those issues that are not appropriate for generic analysis or cannot be fully considered on a generic basis have been designated as Category 2 and as such will receive additional consideration during the site-specific SEIS, regardless of the availability of new information.

Concern Nmbr: NEP.002
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Regulatory responsibility
Associated Comment Nmbr(s): W03.011 W12.031 038.003
Concern: An engineering consulting firm representative (SC&A) queried whether it was within the NRC's regulatory authority to dispose of issues that are under the purview of other Federal or State agencies, e.g., mixed waste is under the RCRA, airborne emissions are under National Emissions Standards for Hazardous Air Pollutants, and aquatic emissions are under the CWA. A representative from the MDNR pointed out at the workshop that by incorporating regulations that are not within its purview, the NRC must recognize that other regulating authorities will have to exercise additional responsibilities as a result of the NRC's action. The NRC should ensure that this is recognized in the bounding conditions it establishes, and that other regulating agencies can accommodate this additional burden. Following up on this comment, in its written comment submittal, the MDNR noted that the license renewal process must ensure compliance with the regulations of these agencies irrespective of their categorical assignments in the GEIS.

Response: The NRC agrees with the commenters that site-specific consideration of compliance with outside agency environmental requirements is required. The NRC's regulation (Section 51.71[d] of 10 CFR Part 51) requires that the NRC give consideration in its EIS to an applicant's compliance with a variety of environmental standards outside of NRC's jurisdiction. These standards include environmental quality standards and requirements imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including applicable zoning and land-use regulations, and water pollution limitations or requirements imposed pursuant to the CWA. This consideration of compliance will occur in the SEIS prepared during a license renewal application; and to the extent that an applicant lacks compliance, the issue will remain open until resolution of the noncompliance issue.

Furthemore, the NRC believes that the GEIS analyses regarding issues under the responsibility of other agencies are appropriate. Section 511(c) of the CWA requires that the NRC accept the determinations of the magnitude of impact as made under the Act and not duplicate reviews done by other Federal or State agencies implementing the Act. The NRC has reviewed these issues for nuclear power plants, characterized the environmental impacts, and concluded that the magnitude of impacts is small. Further, the NRC believes that continued compliance by an applicant will ensure that the respective environmental impacts will remain small.

Concern Nmbr: NEP.003
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: NRC/State review procedure
Associated Comment Nmbr(s): W03.018 W12.014 W12.020 055.003
Concern: The YAEC and representatives (at the workshop) from the EPA and the PSCW asked for detailed information on the procedures to be followed in order to comply with 10 CFR Part 51 and NEPA. In particular:

1. State the information that would have to be addressed by NRC staff in an individual license renewal proceeding.

2. Clarify in the GEIS what plant-specific analyses would be required from an applicant for license renewal to assist the NRC in satisfying its NEPA responsibilities. The NRC should also scrutinize the transcripts from Sessions 12 and 13, where this issue was introduced.

3. Clarify the relationship of the State environmental report or resulting NEPA document to the GEIS, indicating whether the GEIS findings would be explicitly incorporated into or tied to the site-specific NEPA document providing a "tight as a drum scheme."

4. Consider whether NEPA has a provision to designate a lead agency to coordinate the EIS process so that only one document would be prepared, e.g., the California Energy Commission has worked with Federal agencies to prepare joint environmental documents.

Response:

1. The 10 CFR Part 51 language specifies the plant-specific information required from an applicant as well as the specific review and decision criterion to be applied by NRC staff.

2. See response (1).

3. The NRC does not intend to require the use of any State environmental report or State energy plan. It is expected that individual licensees will incorporate this information into their supplemental environmental reports as they deem appropriate. The NRC will issue a site-specific draft SEIS for public and respective State comment. The NRC will consider all comments which provide any new information not previously considered and which bear significantly on the NRC's prior analyses in the GEIS. The NRC will utilize the GEIS findings, as updated by any new and significant information provided by commenters, as tiering information in the site-specific SEIS. The GEIS information will be referenced in the

SEIS, and supplemented by site-specific information for all previously unbounded or unreviewed issues as well as any new and significant information provided during the public comment period of the draft SEIS.

4. The NRC does not intend to designate any lead agency, other than itself, for the preparation of the SEIS. The NRC will incorporate information offered by State agencies during the public comment period if that information is determined to be new and significant to that contained in the GEIS or the site-specific SEIS.

Concern Nmbr: NEP.004
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: NRC/State review procedure
Associated Comment Nmbr(s): W12.015 W12.027 120.002
Concern: During the workshop, there appeared to be some confusion as to how a cost-benefit analysis fits into NEPA's requirements. A NUMARC representative asked whether the words "cost-benefit" appear in the NEPA. An EPA representative asked for clarification on how the cost-benefit determination would affect whether an EA or an EIS was prepared. The relevance of the cost-benefit analysis to a NEPA determination needs clarification. If for example, there was the possibility of an adverse effect on a threatened or endangered species, that might raise an EIS-level question, independent of any cost-benefit analysis.

Response: The NRC has eliminated its traditional cost-benefit analysis for license renewal and will limit its analysis to the environmental impacts of the proposed action. Since the benefits from power generation are essentially the same for all power generation alternatives, a comparison of the environmental costs of alternative sources of power with the impacts associated with license renewal is more appropriate. Additionally, the NRC has determined that for license renewal, any consideration of the economic competitiveness of power alternatives is appropriately left to State and utility decision makers as they have the authority to regulate utility economics.

In most cases, NEPA does not require that agencies consider economic impacts in their environmental analyses, e.g., *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766 (1983); *Olmsted Citizens for a Better Community v. United States*, 793 F.2d 201 (8th Cir. 1986). In addition, NEPA does not require that an agency conduct formal cost-benefit analyses, e.g., *Trout Unlimited v. Morton*, 509 F.2d 1276 (9th Cir. 1976). The NRC regulations (10 CFR 51.71[d]), however, specifically require that the NRC balance the costs and benefits of the proposed action as part of the preparation of an EIS. In addition, 10 CFR 51.71(d) states that the analysis underlying the draft EIS "will, to the fullest extent practicable, quantify the various factors considered." The final rule for license renewal amends § 51.71(d) and § 51.71(e) to ensure that the language in these sections is consistent with the NRC's approach in the GEIS and subsequent site-specific SEISs for license renewal.

Concern Nmbr: NEP.005
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Public participation/Site-specific EISs
Associated Comment Nmbr(s): W04.012 W04.024 W12.016 W12.017 W12.018 W12.019 023.001 024.001 026.002 027.001 030.001 031.008 040.001 042.001 044.002 045.001 046.001 047.001 048.001 049.001 050.001 051.001 052.001 053.001 054.003 054.009a 054.013 059.001 060.001 060.006 061.001 062.002 064.001 065.005 066.001 069.004 070.001 072.001 074.001 081.001 082.001 083.001 085.001 086.001 087.005 087.006 087.010 090.001 090.022 090.031 091.001 092.004 093.001 094.001 096.001 097.001 A113.001 100.001 106.001 106.008 106.009 116.001
Concern: Commenters, both at the workshop and those who sent written comments, representing Federal and State agencies, public interest groups, as well as private citizens, expressed concern that the GEIS does not allow for public participation. The site-specific nature of many significant environmental concerns requires a site-specific EIS, which would give the local residents and State representatives an opportunity to participate in the process. The EPA specifically stated that the NRC should describe the petitioning process that the public would use if they were to comment on a relicensing action. It was concerned that such petitioning requirements would be procedural hurdles for the public in seeking an opportunity to comment on a particular license renewal application, thus complicating the environmental disclosure and review process, and preventing issues of concern from receiving adequate public review.

Response: Each site-specific SEIS will be published in draft form for public comment consistent with the provision of 10 CFR 51.71. The NRC will review all comments received on the draft SEIS regardless of whether the comment relates to Category 1 or Category 2 environmental issues. The results of this review will be reported in the final SEIS, in accordance with 10 CFR 51.91(a)(1).

The NRC will treat comments received on the draft SEIS in one of two ways. First, the NRC may determine that the information furnished is not new and significant, and does not alter the analysis codified in the rule. Second, if it is determined that the information furnished is new and significant, the NRC will include such information in the SEIS and consider it accordingly in its decisions. In addition, the NRC will consider whether such information warrants an amendment to the generic conclusions in the rule.

Commenters who are dissatisfied with the NRC's response may file a petition for rulemaking under 10 CFR 2.802 or seek a waiver under 10 CFR 2.758 in order to pursue the matter in a hearing. The NRC believes that these and other procedures discussed above provide ample opportunity for public participation in the environmental review process for license renewal.

Concern Nmbr: NEP.006
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Periodic assessments
Associated Comment Nmbr(s): W07.003 W08.024 W12.010 W12.011 W12.037 054.006 054.009b 054.018 060.004 079.005 079.007
Concern: The Attorneys General of the States of Connecticut, Minnesota, New York, Vermont, and Wisconsin; the States of Vermont and Minnesota; and representatives (at the workshop) from the CEQ, the EPA, the MDPS, and the firm of Shaw, Pittman, Potts & Trowbridge raised concerns regarding periodic review and modification of the GEIS.

The Attorneys General noted that the rule's methodology is unnecessarily rigid with regard to new scientific information that may arise before a plant's license renewal actually begins. They believe the NRC will be unable to respond easily to new information or to different environmental issues that are not listed in the proposed rule; thus, incorporation of new information can only be achieved through the process of amending the rules.

Similarly, the State of Vermont believes that the requirement of amending the rule is a great burden on the party wishing to put forward new information. Vermont suggested that the precedent established in the existing rule be carried over to license renewal—that any new or significant information be required for the plant-specific environmental review. Vermont recommended that the proposed rule be modified to further clarify the required contents of the supplemental report during the *Operating license renewal stage*. Specifically, proposed 51.53(c)(4) should include the following wording which appears in the existing *Postoperating license stage*, 56 FR 47028, paragraph 51.53(d):

> [The Supplement should] reflect any new information or significant environmental change associated with the applicant's proposed [license renewal] activities.

This change should be reflected in proposed 51.95(c) as well. Vermont also suggested that additional guidance be included in the proposed rule on interpreting the term "significant environmental change".

Likewise with regard to the question of the periodicity of review of the material in Appendix B, Vermont recommended that the NRC give consideration to returning to the plant-specific method for the NEPA determination. If, however, the generic approach is pursued, then Vermont believes that the periodicity of review and update should be stated in the rule. (Vermont believes that the economics of the GEIS are outdated even now, and therefore the periodicity of the review should be no greater than two years.)

Minnesota believes that the proposed rule should be either withdrawn or modified to provide for an NRC review of the GEIS's adequacy every 5 years at a minimum. It believes that the proposed rule ignores NEPA's mandate to consider significant new information because there is no provision to permit examination of significant new information for any issue determined as acceptable in the GEIS, or for the introduction of new information during NRC consideration of a specific license renewal application. Likewise, there is no periodic agency review of the underlying GEIS. Minnesota also points out that the CEQ definition of significance requires, at the least, the preparation of an SEIS. Significant new information, similar to the severe accident

issue, may arise in the future. Consideration of that information must be mandatory in the proposed rule. Minnesota recommends insertion of the following provision:

> "When significant new circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts exists at the time of license renewal, the applicant must address it in the applicant's environmental review and the NRC must address it in an SEIS."

This provision should follow Section 51.53(c)(3)(i) by ending (i) with "supplemental report except", then adding this provision as subheading (A). Additionally, the following underlined phrase should be added to the last sentence under Appendix B to Subpart A: "The commission will review periodically the material in this appendix and update it every 5 years and more often if necessary"

CEQ and EPA representatives at the workshop favored setting a specific review time (but not necessarily having a sunset provision). A lawyer suggested that the NRC specify the review process in the GEIS.

[See also GIS.015.]

Response: The NRC revised the 10 CFR Part 51 rule to require that a site-specific SEIS be prepared and issued for public comment during each license renewal application review. This provides an opportunity for new and significant information to be disclosed by members of the public, the States, or the scientific community that could have relevance to the NRC's previous analyses in the GEIS. The NRC will review information received on all environmental issues, regardless of their categorization in the GEIS.

In addition, every seven years, the NRC will undertake a review of the adequacy of the GEIS to determine if any new and significant information should be added to the rule's codification of license renewal impacts. The NRC will publish for comment its decision regarding the necessity to modify the rule and the GEIS.

Concern Nmbr: NEP.007
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Cumulative impacts
Associated Comment Nmbr(s): W12.006 W12.021 W12.032 W12.033 W12.034 W12.035 011.003 031.006 038.005 054.005 054.021 054.022 060.005 063.007 083.002 088.002 092.005
Concern: The following agencies and their representatives raised issues related to cumulative impacts: the CEQ; NUMARC; the Attorneys General from Connecticut, Minnesota, New York, Vermont and Wisconsin in a joint comment; the MDNR; Minnesota Agencies; the New Jersey Department of Environmental Protection and Energy; the NYSEO; Consolidated Edison; the Cape Cod Commission; and the Southeastern Regional Planning and Economic Development District (SRPEDD).

The Attorneys General stated that the "synergistic or cumulative effects" of the 104 environmental issues identified in proposed Appendix B of Part 51 must be considered by the NRC on a plant-specific basis in reviewing any license renewal application. Citing *Kleppe v. Sierra Club*, 427 U.S. 390 (1976), they stated that:

> "individual effects may be small, but through interaction or through accumulation the total effect may be devastating to the environment for a particular plant. Under NEPA, Federal agencies must determine cumulative effects of a program, not simply individual effects . . . .
>
> A case-by-case basis is necessary to explore how the factors identified in the GEIS might interact in particular cases."

Each time a license renewal application is filed, the Attorneys General stated, the NRC must study the interaction of the 104 environmental issues listed in Appendix B of Part 51 at the site involved.

A CEQ workshop participant observed that there appeared to be no mention of how cumulative impacts were addressed in the GEIS, and noted that for any license renewal, the impact of the plant's license renewal must be looked at together with the impacts of other foreseeable actions in the area surrounding the plant since the combined impact may be significant. The CEQ, in written comments, indicated that under the NRC's proposed scheme, it would not be necessary to reexamine those 80 Category 1 and some of the 22 Category 2 issues in a subsequent decision to renew an operating license. Hence, the NRC's approach neither allows for the consideration of the cumulative impacts from "small" Category 1 issues, nor the cumulative impacts of all issues in the three different categories. (At the Workshop, an EPA representative had requested an explanation of the procedure for combining previously considered issues, e.g., Category 1 issues, with those to be addressed in an individual license renewal proceeding, noting that an explanation of how the cumulative impacts of Category 1, 2, and 3 issues were addressed and would be documented would greatly support the NRC's approach.) In a comment similar to the CEQ's, NUMARC added that the final rule should explain how the cumulative environmental impacts of license renewal are addressed. This should also be addressed in the GEIS.

The remaining commenters reiterated the concerns that appear above. Consolidated Edison pointed out that there could be positive as opposed to negative cumulative environmental impacts. Minnesota commented that the generic conclusion in the GEIS whereby 98 percent of the NEPA issues are identified as acceptable for all plants, is "totally flawed and must be rejected." Finally, SRPEDD noted the significance of cumulative effects in terms of safety and environmental health.

Response:

1. Concerns of Attorneys General: The State Attorneys General appear to argue that the cumulative impact requirement under NEPA refers to an agency obligation to consider the total impact created by all the individual impacts of the proposed action. Both the CEQ's regulations and the *Kleppe* decision make it clear, however, that cumulative impacts generally associated with NEPA involve consideration of the cumulative impacts created by the proposed action in conjunction with other relevant actions in the area surrounding the site of the proposed action (see, 10 CFR 1508.7; *Kleppe v. Sierra Club*, 427 U.S. 390, [1976]).

Neither the cited CEQ regulations nor the relevant portions of the *Kleppe* decision refer to the issue of cumulative impacts of the particular proposed action in question as argued by the State Attorneys General. Despite the NRC's disagreement with the State Attorneys General on the generally accepted meaning of cumulative impacts, the NRC believes that the GEIS and the SEIS, themselves, will allow the NRC to consider fully the total environmental impacts created by license renewal at an individual plant.

2. CEQ Concerns: The NRC recognizes that the consideration of the impacts of a proposed action must involve the cumulative or combined effects of all activities surrounding the plant to the extent that there are any, and not simply the singular effects of the proposed action. In preparing the final GEIS, the NRC staff has considered the cumulative effects of the impacts from license renewal.

Concern Nmbr: NEP.008
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: NRC/State review procedure
Associated Comment Nmbr(s): W07.002 W07.017
Concern: At the workshop, representatives from the EPA and the Oregon Department of Energy raised concerns related to the GEIS assumptions and the findings on decommissioning. The EPA representative questioned whether an EIS would automatically be triggered if the impact from decommissioning fell outside certain bounds, and, if so, what the procedures would be. The Oregon representative wanted to know what constitutes falling outside of the analysis in regard to how licensees should address Category 1 issues. Specifically, he was concerned that the Category 1 finding for decommissioning issues was premature since there could be changes resulting from refurbishment which would result in differences from the decommissioning assumptions. It is not clear how these differences are going to be handled.

Response: In response to the question of how an EIS may be triggered, the NRC has determined that a site-specific SEIS must be prepared for each and every license renewal application. This SEIS will supplement the GEIS on the issues that were not bounded by the GEIS analysis, and will include any new and significant information that is provided during the draft SEIS comment period.

In response to the concern that site-specific refurbishment differences might result in invalidating the decommissioning assumptions, the NRC disagrees. The purpose for reviewing decommissioning in the GEIS was not to perform an exhaustive analysis of the impacts of decommissioning, but rather to show that decommissioning at year 40, in all practicality, yields environmental impacts that are substantially similar to the environmental impacts of decommissioning at year 60. Any variations in refurbishment scenarios among license renewals are expected to be within the GEIS bounding scenarios and, moreover, within the realm of normal operational activities that could be expected for plants that do not seek license renewal. Therefore, the NRC does expect that any specific license renewal situation will be so far outside the decommissioning assumptions as to invalidate its conclusion that the effects of decommissioning after a 20-year license renewal term will not differ from those of decommissioning at the end of 40 years of operation. Thus, the final rule retains decommissioning impacts as Category 1.

Concern Nmbr: NEP.009
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Periodic assessments
Associated Comment Nmbr(s): W04.026 W04.027 W04.028 028.001 116.002
Concern: At the workshop, representatives from the EPA, the Oregon Department of Energy, and PSCW raised concerns related to the sensitivity of the GEIS assumptions. Earth Concerns of Oklahoma and the Windham Regional Commission also submitted written comments. The following points were raised.

1. The EPA representative noted that an implicit assumption in the GEIS is that the conditions do not change. He then raised the question of what would be the conditions under which an issue could be reopened 10, 20, or 30 years from now. He suggested that the GEIS should provide some indication of the sensitivity of the results and conclusions to changes in the assumptions.

2. The Oregon representative supported the need for a sensitivity analysis because the document would be a more defensible one. He was concerned that if some critical piece of the analysis changed significantly because of research or new understanding, it might not be difficult for an outside group to get the GEIS thrown out, and the whole basis of the analysis would need to be redone.

3. The PSCW representative suggested that an alternative (to a sensitivity analysis or risk assessment) would be to do a supplemental GEIS on the parts that have changed.

4. Earth Concerns noted that the NRC, by trying to increase the number of generic assumptions involved in decision making, will logically weaken the conclusions to be applied 20 years into the future.

5. Finally, the Windham Regional Commission commented that the GEIS does not adhere to the CEQ's NEPA provisions for the preparation of a GEIS because the decision to relicense each nuclear plant does not have "common timing, impacts [or] alternatives . . ." (40 CFR 1502.4[c][2]). It believes that only a few impacts associated with the operation of nuclear plants generically meet these NEPA criteria.

Response:

1. The NRC does not suggest in the GEIS that conditions do not change. However, the NRC believes that its analysis is sufficiently broad such that all plant-specific situations will be within the GEIS bounding analyses. Nonetheless, the NRC is providing members of the public the opportunity to comment on any issue for which they believe there is new and significant information bearing on the GEIS analyses.

2. The NRC does not believe that sensitivity analysis would prove useful to the GEIS analyses of impacts. The NRC believes that its provision of considering new and significant information at the site-specific application review will enable the NRC to make a case-specific assessment of whether this new information will alter any previous conclusions regarding environmental impacts.

3. The NRC intends to prepare a supplement to the GEIS during each license renewal application review. The SEIS will address all Category 2 issues from the GEIS and any new and significant information provided by the public.

4. The NRC will conduct a periodic review of the GEIS and rule to determine whether the documents require updating. Additionally, the NRC will consider new and significant information provided by the public during the public comment period for the SEIS. Therefore, due to this periodic updating and site-specific consideration of new and significant issues, the NRC does not believe that the GEIS conclusions will "weaken" in the future or that the GEIS analysis of issues will be considered "untimely" in site-specific reviews. In addition, the NRC does not believe that the provision regarding timing in 40 CFR 1502.4(c)(2), as cited by one commenter, refers to a NEPA requirement, but rather reflects one of several situations in which, according to the CEQ, the preparation of a generic statement is appropriate.

5. See response (4).

Concern Nmbr: NEP.010
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Analysis of alternatives
Associated Comment Nmbr(s): 043.006 092.003 117.001
Concern: Both the CEQ and the State of Massachusetts raised concerns about environmental costs and benefits. A CEQ representative at the workshop questioned what seemed to be a determination on the alternatives issue that is based solely on costs. NEPA requires that the decision be based on factors other than costs. Even if it is treated solely as a cost question, there are environmental costs and benefits that need to be factored into the equation such as waste, excessive carbon dioxide in the air, and global warming. In its formal submittal, the CEQ reiterated this same concern and noted that these environmental ". . . costs and benefits are difficult, if not impossible, to quantify."

The State of Massachusetts pointed out that the evaluation of the need for resources and the alternatives to meet that need are fundamental components of the Integrated Resource Management (IRM) process. Under IRM, demand-side and supply-side resource proposals, which could include nuclear relicensing projects, are compared on the basis of social cost, including explicit consideration of certain environmental impacts.

Response:

1. The NRC revised 10 CFR Part 51 (see 10 CFR 51.103[a][5])to limit its decision criterion to a consideration of environmental impacts only. The traditional cost-benefit analysis has been eliminated.

2. The NRC eliminated any consideration of need for power in its license renewal NEPA review. The NRC believes that the determination of how much and what type of generation resources are required is the responsibility of State and utility officials and, in some cases, Federal energy planners. The NRC will limit its review to an analysis of the environmental

impacts of the proposed action compared with environmental impacts of alternatives to the proposed action.

Concern Nmbr: NEP.011
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Proposed rule evaluation
Associated Comment Nmbr(s): 001.004
Concern: A private citizen suggested that an impartial panel review the results of the categorization and findings on the 104 NEPA issues that appear in Table B-1 of the proposed Part 51 rule (*Federal Register* notice, pp. 47029–47035). She further suggested that the panel include NRC representatives as well as representatives from environmental and public interest groups.

Response: The NRC does not believe that it is necessary to establish a separate panel to review the results of the GEIS findings. The NRC's process includes public comment and review of the NRC's proposals. The NRC considers all public comments prior to making any final decisions.

Concern Nmbr: NEP.012
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Regulatory responsibility
Associated Comment Nmbr(s): 054.008 054.014 054.015 054.016 086.002 116.003 117.003
Concern: Minnesota and Massachusetts State agencies pointed out that the bifurcated method of analysis used by the NRC prevents cooperation with State and local agencies who have their own environmental protection acts (e.g., there is no provision for considering a State EIS, and conflicts between the proposed action and the environmental objectives of local governments will not be considered). In defense of their position, the two agencies cite 40 CFR 1501.7, 1501.7(6), 1502.5(b), and 1506.2(b) and (c). A similar concern was raised by a public interest group and a local agency.

Response: The NRC will prepare an SEIS for each site-specific license renewal application. In accordance with 10 CFR 51.74(a)(4), the NRC will distribute the draft SEIS to "appropriate State and local agencies authorized to develop and enforce environmental standards." To the extent that relevant information generated by State and local governments exists at the site-specific stage, the NRC will consider such information in preparing the SEIS. The NRC will also consider any conflicts between the proposed action and the environmental objectives of local governments at that time.

Concern Nmbr: NEP.013
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Periodic assessments
Associated Comment Nmbr(s): 063.006
Concern: NUMARC took exception to the NRC's position to revisit the GEIS conclusions at some future point in time. It strongly urges the NRC both to make it clear that any suggestion to reevaluate the GEIS is outside of individual licensing proceedings, and not to adopt a policy to

reexamine these findings at an arbitrary and fixed frequency. Rather, a threshold test for reexamination should be whether any new information is relevant and if it is of such significance that, had it been known when the issues were evaluated for the original GEIS, it may have changed the outcome of the NRC's determination on a particular issue. (This concern is opposite that of NEP.006.)

Response: The NRC intends to conduct a periodic review of the validity of the GEIS analysis; however, it will revise the rule and the GEIS if it determines that there is new and significant information to warrant such a revision. The NRC will publish its review findings for public comment.

Concern Nmbr: NEP.014
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 055.004
Concern: The YAEC objected to the use of bounding criteria in the GEIS and suggests that individual impacts be addressed with representative impacts instead of bounds. It suggested that, where appropriate, maximum or minimum estimates could be used as a means of establishing a sensitivity analysis.

Response: The NRC has revised the GEIS to include discussion of a typical license renewal scenario that may be more representative of actual environmental impacts associated with renewals. However, the NRC still uses a bounding or conservative license renewal scenario in order to be representative of those plants that may require more license renewal activities and, therefore, cause greater environmental impact than the average plant under the typical scenario. Without this bounding analysis, the NRC would be forced to conduct specific reviews for any outlier plants applying for license renewal. This would reduce the intended efficiency and stability of the Part 51 rulemaking. Therefore, the NRC retains the bounding analyses approach in the revised GEIS, but includes a less conservative (i.e., typical) scenario for the purpose of disclosing the reduced impacts associated with a typical license renewal applicant.

Concern Nmbr: NEP.015
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Documentation
Associated Comment Nmbr(s): 056.001 056.015
Concern: The DOI believes that even if a GEIS is used for license renewal, each applicant should be required to confirm these conclusions with documentation, including the results of consultation with appropriate local, State, and Federal agencies at the time of license renewal. Furthermore, it believes that all adverse impacts associated with relicensing, regardless of magnitude, must be addressed, and that any decision to eliminate "small" impacts from consideration must be based on consultation and concurrence with the appropriate agencies. Regarding question 1 in the proposed Part 51 rule which asked if the proposed rule could be supported by a technical study, the DOI stated that appropriate environmental documentation for the license renewal decision should be prepared, and that alternative analyses during part of the

documentation process should be required. The agency noted, however, that technical studies may not suffice for NEPA compliance.

Response: The NRC believes that its analysis is sufficiently broad so as to apply to all plants considering license renewal. Based on the NRC's confidence in the applicability of its generic review, it does not see any reason to require that an applicant perform a site-specific validation of GEIS conclusions. The NRC believes that such a requirement eliminates the efficiency and stability sought by the Part 51 rulemaking. The NRC intends to conduct periodic reviews of the GEIS to ensure the current applicability of the GEIS to all plants, and will revise the GEIS and rule as necessary. Additionally, the NRC will issue a draft SEIS for public comment and will consider comments on all environmental issues, including those that were generically analyzed in the GEIS, to determine if the comments offer new and significant information and if any different interpretation of the GEIS analysis of impacts for a particular site is warranted.

With regard to consideration of adverse impacts, the NRC has revised the Part 51 rule to reserve for the site-specific review the comparison of adverse environmental impacts of license renewal with the adverse impacts of alternative energy sources. This comparison of impacts will be performed in the SEIS. It should be noted that the Part 51 rule does not eliminate any environmental impacts from consideration, rather it codifies many of the known impacts such that an applicant need not analyze these issues further. The NRC will consider, in the SEIS, the environmental impacts associated with license renewal for all Category 2 issues. The SEIS will also consider the results of any consultation with other agencies as well as an applicant's compliance with outside agency environmental standards as required by NRC NEPA regulations (10 CFR 51.71[d]).

Concern Nmbr: NEP.016
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Compliance with other regulations
Associated Comment Nmbr(s): 056.002 087.001 087.002
Concern: The DOI indicated that Federal permit renewals, such as plant relicensing, will be reviewed at permit renewal time in compliance with the Mitigation Policy Act of 1981. This Act provides guidance in recommending appropriate mitigation measures for all land and water developments that would affect U.S. waters, and requires a Federally-issued permit or license. On the other hand, the EPA expressed a more general concern that the GEIS does not comply with all pertinent regulations. It cited 10 CFR 51.71(d), which requires that all environmental impacts, irrespective of whether a certification or license from an appropriate authority has been obtained, be considered. Moreover, neither the Regulatory Guide nor the Standard Review Plan (SRP), in support of the proposed rule, calls for a demonstration of compliance.

Response: Consistent with 10 CFR 51.71(d), the NRC will consider all environmental impacts, irrespective of whether a certification or permit has been obtained from an outside agency. However, Section 511(c) of the CWA requires that the NRC accept the determinations of impacts made under the CWA. Since the GEIS analysis relies on the separate permitting authority for determinations of the magnitude of certain environmental impacts, the NRC will consider an applicant's status of compliance in the site-specific review. The NRC's *Environmental Standard*

Review Plan for License Renewal will include a requirement to consider compliance with outside agency environmental standards and requirements consistent with 10 CFR 51.71(d).

Additionally, the Part 51 rule will require that the NRC consider site-specific mitigation of adverse impacts for Category 2 issues. A generic consideration of mitigation has been included in all Category 1 issues, such that site-specific consideration is not necessary.

Concern Nmbr: NEP.017
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Mitigation
Associated Comment Nmbr(s): 087.012
Concern: The EPA pointed out that even though the GEIS categorizes the majority of issues as generically "small" impacts, the requirement to consider mitigation and, in appropriate cases, monitoring needs to be addressed to comply with 40 CFR 1502.16(h). Additionally, in most instances, the GEIS neither supports the conclusions arrived at when categorizing impacts, nor provides justification for classifying over 80 percent of the impacts as Category 1, making a strong case for appropriate mitigation procedures.

Response: The changes made to the 10 CFR Part 51 rule require the NRC to consider mitigation of adverse environmental impacts for Category 2 issues during the site-specific review of a license renewal application. A generic consideration of mitigation has been included for all Category 1 issues such that site-specific consideration is not necessary.

Concern Nmbr: NEP.018
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: NRC/State review procedure
Associated Comment Nmbr(s): 087.003
Concern: The EPA questioned whether it was appropriate for the NRC to conclude, in the preamble to the proposed Part 51 rule, that the proposed regulation is the type of action that may be categorically excluded from a NEPA review.

Response: Section 51.22 (c)(3)(i) of 10 CFR Part 51 specifies that an amendment to Part 51, which relates to procedures for filing and reviewing (1) applications for licenses or construction permits or other forms of permission, or (2) amendments to or renewals of licenses or construction permits or other forms of permission, is categorically excluded from an environmental review. The NRC has determined that this amendment to Part 51 is for the express purpose of establishing the procedures for filing and reviewing a license renewal application, and therefore is subject to this categorical exclusion.

Concern Nmbr: NEP.019
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Rulemaking process
Associated Comment Nmbr(s): 106.010
Concern: The Deerfield River Compact strongly favors a process that is similar to the FERC process where relicensing must be responsive to existing comprehensive planning documents and requirements that are endorsed by State or Federal agencies. It is very concerned that licensing and relicensing are treated as separate issues, and it contends that all license renewals should be treated as new licenses and, therefore, subject to all current environmental laws and regulations.

Response: Consistent with revised 10 CFR 51.71(d), the NRC intends to consider compliance with current environmental standards and requirements of outside agencies. This consideration will be given at the site-specific review and will be included in the NRC's license renewal environmental SRP.

Concern Nmbr: NEP.020
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Purpose and use of GEIS
Associated Comment Nmbr(s): 087.008a
Concern: The EPA suggest that site-specific design features, geographic locations, and population density limit the applicability of the GEIS to all plant license renewal actions. Very detailed EAs or EISs will be necessary to adequately address the environmental impacts at each plant applying for license renewal, despite the potential of the GEIS to aid in drawing conclusions on certain types of impacts.

Response: The NRC disagrees that site-specific variances will limit the applicability of the GEIS. The NRC believes that it has prepared a broad-scoped analysis that bounds all currently operating nuclear power plants. The NRC intends to prepare an SEIS during the site-specific review to review all Category 2 issues, as well as to consider any public comments received that are determined to provide new and significant information affecting the results and conclusions in the GEIS. Additionally, the NRC will perform a periodic review of the rule and the GEIS to determine its ongoing validity and applicability to all plants.

Concern Nmbr: NEP.021
Topic: Compliance with 10 CFR 51 and NEPA
Subtopic: Purpose of GEIS
Associated Comment Nmbr(s): 120.001
Concern: Attorneys Gallo and Ross, commenting on the CEQ's suggestion that the GEIS be used as a tiering document, noted that the effect of this would be that the NRC would not issue the proposed regulation, but rather the GEIS would serve only as a source document for the preparation of plant-specific EISs at the time of the renewal application. Gallo and Ross stated that although the tiering process suggested by CEQ is an acceptable NEPA procedure, it does not serve the NRC's objective of establishing a stable and predictable licensing process for renewing nuclear power plant licenses and for conserving agency resources. Furthermore, using the GEIS as a tiering document would trigger the unnecessary reconsideration of environmental information

because Federal, State, and local agencies, and the public would have to comment again on generic environmental information when site-specific EISs are circulated for comment. (See Comments 092.001 and 092.002 by the CEQ.)

Response: The NRC agrees with the commenter and, therefore, will codify key environmental impacts analyzed in the GEIS. The NRC, however, will utilize the GEIS as a reference document for the analysis of environmental impacts of alternative energy sources. The final rule does not reach conclusions on the comparison of license renewal with other alternative energy sources. This will be done as part of the site-specific review.

C-10. Topic: Need for Generating Capacity (NGC)

Need for Generating Capacity (NGC)

Concern Nmbr: NGC.001
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.001 W08.003
Concern: State representatives suggested that the price of additional power needed to be competitive should be addressed in the analysis. One representative also disagreed with what he believes to be NRC's assumption that "nuclear will always be the first economically dispatched resource . . ." since there are other cost-related assumptions that affect the economic decision (e.g., nuclear waste disposal costs).

Response: The NRC will limit its NEPA review principally to a consideration of the environmental impacts of license renewal. Accordingly, Chapter 8 and Appendix H of the draft GEIS have been deleted.

Concern Nmbr: NGC.002
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 079.104
Concern: Two recent analyses (the *Vermont Comprehensive Energy Plan*, January 1991; and *DPS Technical Report No. 16*, 1989) have been conducted for Vermont. Although the forecasts in these analyses may be modified by a new forecast in progress, the Energy Plan projected a base case generation growth from 16.96 Tbtu in 1990 to 28.28 Tbtu in 2010 (Ibid., Table 5.6, p. 183). This corresponds to a 2.59 percent annual growth rate. If the aggregate recommendations of the Energy Plan are implemented, generation demand in 2010 is reduced to 20.05 Tbtu, an annual growth rate of 0.84 percent. *DPS Technical Report No. 16* considers several demand scenarios. These forecasts were developed using only existing levels of DSM. However, with additional DSM measures, which can reasonably be expected to be implemented, strong DSM capacity savings would be achieved. Based on these forecasts, it is possible to choose an aggregate forecast for the year of Vermont Yankee license renewal based on a composite 1.5 percent growth rate from 1988. This results in a 2012 capacity demand in Vermont of 1,372 MW.

Response: The NRC has eliminated consideration of energy demand forecasting from its license renewal review. The NRC considers a license renewal application to be for the purpose of providing the availability of a power generation source beyond the term of current operating licenses to meet any future generating needs as determined by State and utility officials. Determination of how much electric generation is required is the responsibility of State and utility energy planners, and DSM is an integral part of this determination. Therefore, the NRC will not interfere with "need for power" decisions, and will limit its NEPA review to a consideration of the environmental impacts of license renewal as compared with those of other available generating sources.

Concern Nmbr: NGC.003
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.007
Concern: A State representative brought up the subject of greenhouse effects that potentially could benefit nuclear power. In this regard, he mentioned that the State of Michigan is cooperating with the EPA on a document on the potential impact of greenhouse effects on Michigan's electric generation. It might be useful for the NRC to examine this document because it includes nuclear license extension and new plants, and the potential for these plants to provide electricity on an economically competitive basis.

Response: Consistent with the NRC's determination not to consider utility economics or other issues over which States have jurisdiction, the NRC will not use greenhouse effects to make determinations regarding economic competitiveness among alternatives.

Concern Nmbr: NGC.004
Topic: Need for Generating Capacity
Subtopic: State participation
Associated Comment Nmbr(s): W08.002 W08.005 W08.006 W08.008 W08.009 W08.019 W08.020 W08.027 W08.029 W08.032 W12.023 W12.026 031.002 054.002 054.010 054.023 054.024 054.025 054.026 054.027 054.028 054.029 054.030 054.034 055.002 057.001 059.007 060.007 063.004 064.002 075.003 079.019 079.032 079.035 079.036 079.041 079.071 079.074 079.076 079.079 079.080 079.082 079.083a 079.083d 079.087 079.088 079.099a 087.114 090.003 090.005 090.009 090.010 090.011 090.012 090.013 090.016 090.018 093.002 093.003
Concern: The EPA, the State agencies for Michigan, Minnesota, Vermont, and Wisconsin; the Attorneys General for the States of Connecticut, Minnesota, New York, Vermont, and Wisconsin; NUMARC; YAEC; the MPIRG; the UCS; the NECNP; and representatives from the DOE, and the Minnesota and New York agencies pointed out that determination of need is a State, not Federal, responsibility. They made the following points:

1. The AEA, as amended, and relevant case law leave to State public utility commissions or similar bodies the responsibility for making decisions regarding the need for power. The decision of the Supreme Court in *Pacific Gas & Electric* also recognizes this State authority (thus need for generating capacity should be a Category 3 issue, the Attorneys General argued). Although the Supreme Court has not created a clear test for preemption cases, it has developed rules for different categories of cases, which "require a clear and manifest purpose of Congress" before they are found to be preempted (*Rice v. Santa Fe Elevator Corp.*).

2. Given the above, commenters believe that the proposed rule should be withdrawn, modified to specifically state that it does not preempt State jurisdiction, or a mechanism or procedure should be developed jointly by the States and the NRC to recognize State determinations of need in the license renewal process. The Minnesota agencies submitted the following provision to be placed in proposed Section 51.53(c) as a new "(5)" or as part of "(4)":

"The supplemental report must contain the State's decision on the need for that applicant's nuclear power generation. Where the State has found no need for continuing power generation by the applicant plant, the findings documented in Table B-1 of Appendix B of Subpart A of this part no longer demonstrate that renewal of the applicant's operating license will have accrued benefits that outweigh the economic, environmental and social cost of license renewal."

In addition, Minnesota submitted the following as an amendment to 10 CFR 51.1, or insert in the introductory material in Appendix B to Subpart A after the second sentence and immediately preceding the sentence that begins, "Table B-1 . . .":

"These regulations do not preempt a State's right and responsibility to determine need for continued nuclear power generation based on non-safety considerations including its own State and local environmental reviews."

Also, NUMARC recommended the inclusion of the same language in proposed section 51.95(b) into proposed section 51.95(c).

3. Closely related to and interwoven with the arguments on preemption of State authority were comments related to the inadequacy of the GEIS treatment of the need for generating capacity. Commenters noted (1) the changing nature of electrical generation and uncertainty in prediction of need; (2) the impacts of either expected or unforeseen changes in the industry, regulations, or emerging technologies (and resulting increased efficiencies and conservation); and (3) uncertainties in the values used. Commenters indicated that changes to the analysis could not sufficiently reduce the uncertainty to allow it to remain the basis of relicensing decisions made decades from now. As a result, need for generating capacity issues should be reassigned to Category 3.

4. The expertise of the States and level at which resource planning is done was also mentioned by commenters. At the workshop, a NUMARC representative noted that he believes it is a mistake for the NRC to assume responsibility in evaluating load forecasts, demand reduction scenarios, and the development of alternate power sources given the NRC's lack of expertise in these areas. Wisconsin added further that (1) the review of need in the draft GEIS is not adequate for the future 20-year reviews perfomed every two to three years in Wisconsin; and (2) the GEIS review covers broad regions rather than States.

5. Two comments (from the EPA and the Tellus Institute study [VT]) termed as premature the conclusion that license renewal is even needed. They noted that regardless of conclusions in the GEIS, an examination of need by the State utility regulatory authority will take place closer to the time of license renewal. Two key electric system planning and EIS questions are (1) is the generating capacity needed, and (2) is the proposed action (i.e., license renewal) the "best" alternative for meeting the need? The EPA believes that since the GEIS has not resolved all of the impact issues (i.e., there are Category 2 and 3 issues), an affirmative answer to the second question cannot yet be established, and therefore it cannot be generically concluded that there is a need for generating capacity via license renewal.

6. Finally, commenters mentioned the need for additional or more current information from the referenced studies to help substantiate the conclusions and provide an opportunity to examine

more of the underlying assumptions. For example, a more recent version of the Sandia report is available that shows capacity additions planned through 2000. These additions of capacity, which NRC had not included, would add to the energy available from currently existing and planned facilities, and hence would reduce the deficit in generation that the NRC projected using its methodology.

Response: The NRC has eliminated consideration of electric generating necessity (i.e., need for power) and utility economics from its NEPA review, and will limit its NEPA review to a consideration of the environmental impacts of license renewal as compared with those expected from a range of viable energy generation alternatives. As such, Chapter 8, Appendix H, and any economic cost-benefit balance in the draft GEIS have been deleted.

Concern Nmbr: NGC.005
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.010 W08.012 W08.013 W08.017
Concern: State and industry representatives voiced difficulty in replicating or verifying the analyses that were done in Section 8 of the GEIS. They specifically pointed to the following: (1) it was difficult to determine whether the analysis considered the operation of Niagara Falls in the "year 2028 or 2020"; (2) there is a need to provide the basis for regional [forecasting] analysis versus analysis based on a local or State area, as well as to provide additional technical information on [demand] projections; (3) there is a need to provide more background information on why eleven regions were used instead of the nine North American Electric Reliability Council (NERC) divisions; and (4) there should be more information on the forecasting approach used.

Response: Chapter 8 of the draft GEIS has been deleted, consistent with the NRC's decision to eliminate the consideration of need for generating capacity from its NEPA review for license renewal.

Concern Nmbr: NGC.006
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.014
Concern: An industry representative wanted more detail on the 8.4 percent number that represents the amount of electricity that could be saved in the future by energy-saving measures. Also, the NRC should explain what energy-saving measures mean.

Response: Consistent with the NRC's decision to eliminate all consideration of need for power analyses from its license renewal review, Chapter 8 of the draft GEIS has been deleted. Conservation of energy and energy importation are addressed as part of the discussion of alternatives to license renewal. They are tools State and utility officials use to mitigate the demand for local electric power production.

Concern Nmbr: NGC.007
Topic: Need for Generating Capacity
Subtopic: Reliability of power supply
Associated Comment Nmbr(s): W08.015 W08.031 079.040 079.083b
Concern: The State of Vermont commented that the NRC's assessment of the need for relicensed nuclear plants is too crude and general to be useful for making decisions. The State noted that the NRC has made its determination on the basis of energy requirements alone, without making the appropriate distinctions between energy and peak capacity requirements, without distinguishing between the operating characteristics of different plant types—baseload, cycling, and peaking (and thereby failing to consider peaking and cycling resources as future electric supply options), and without distinguishing between the technical characteristics of power plant operation (availability) and the outcomes of operating decisions (capacity factors). The need for new generating capacity is more appropriately addressed in terms of total MW of capacity to meet peak system demands with sufficient reserve margin for reliability with the mix of capacity types determined by the operating characteristics and economics of the various power supply alternatives. The GEIS approach neglects the role of peaking and cycling units, underestimates the available energy from currently operating facilities and, thereby, overestimates the need for baseload power supply and nuclear relicensing in particular.

An industry representative additionally asked how energy storage technology, fuel cells, etc. are factored into the need for generation and whether they will significantly affect the modeling by shifting peak generation to base load generation. Finally, an academic group pointed out that the reliability of power supply needs to be addressed, not just whether there is enough capacity. (Commenter seems to suggest that the main focus of the analysis is on future demand and whether there is enough capacity to meet that demand, but reliability of the power supply is not considered.)

Response: The NRC recognizes that reliability of power and type of power (baseload and peak) are factors that State and utility officials consider in making their energy mix decisions. Therefore, energy demand forecasts, energy reliability, and any distinction between baseload or peak requirements are not relevant to the NRC's license renewal decision.

Concern Nmbr: NGC.008
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data/Categorization
Associated Comment Nmbr(s): W08.018 W08.021 W08.022 031.003 054.035 079.099b 081A.009 090.019 090.020 090.021
Concern: The State agencies for Minnesota, New York, and Vermont; the NIRS; the MPIRG; and representatives from the DOE and PSCW commented on this concern. They questioned the capacity factors used in the analysis, in particular noting the following:

1. The capacity factors used by Wisconsin for old and new baseloaded plants range from 40 to 80 percent.

2. "Median hydro conditions" used by DOE give rise to a capacity factor considerably less than the 60 percent used in the GEIS. The DOE commented, moreover, that using its assumptions

on hydro capacity factor, States in the northwest region (i.e., Washington, Oregon, and Idaho) will require new capacity by the year 2006, which is well in advance of the 2020 timeframe used in the base case of the GEIS.

3. The DOE also noted that nuclear plant capacity factors have improved over the last four years: in 1988 the nationwide capacity was about 63.5 percent and to date it is about 66.7 percent. The DOE suggested that NRC consider using 62 percent instead of 60 percent for the nuclear plant capacity factor, and also consider how this could impact the need for power.

4. New York and MPIRG commented that the GEIS estimate of current nuclear capacity available is flawed because it includes capacity provided by 118 nuclear power plants (construction at 4 of those plants has stopped and operations have terminated at 3—Shoreham, Rancho Seco, and Yankee Rowe.)

5. Vermont pointed out that the GEIS does not credit coal plants for their higher availability (80 percent) than nuclear plants (62 percent) per the Sandia Research Laboratory report used by the NRC for the year 2015. This means that in order to produce the same amount of electricity over one year, the coal plant needs only 77.5 percent (62/80) as much capacity as the nuclear plant. Therefore, the costs for the coal plants on a per kW of nuclear equivalent basis should be reduced by the same ratio. Correcting for availability will have a significant negative effect on the relative economic attractiveness of nuclear license renewal.

6. The NIRS inferred that older reactors that have lower capacity factors and less electrical output were not considered in the analysis, and that this would have affected the GEIS conclusion that license renewal is the best alternative.

   The MPIRG emphasized that capacity declines as plants age, and no scientific basis exists to assert that this will reverse in the license renewal period. Furthermore, no evidence exists to show that capacity will hold steady at 60 percent during the license renewal stage. On the contrary, studies documented on both U.S. and Canadian reactors show that nuclear plant performance declines due to age-related degradation as measured by reduced capacity factors. The MPIRG concludes that the NRC assumption that nuclear power plants will continue to provide power at 1990 levels for another 40 years is clearly optimistic speculation which could cause capacity shortfalls. The MPIRG believes that capacity shortfalls will result from reduced availability, unplanned events (such as a prolonged or permanent plant shutdown), and continued public opposition to plant operations without solutions to permanent HLW storage.

7. Finally, Minnesota commented that the NRC's recognition that capacity utilization factors vary considerably by type of generating capacity, over time, and by region should lead to designating the affected issues as Category 3 instead of Category 1 or 2. Experience in Minnesota indicates that capacity factor utilization can be a critical factor in determining generation supply mix for a utility. If the NRC persists in defining affected issues as Category 1 or 2, it must demonstrate that its analysis results are insensitive to large variations in capacity utilization and that these results can be validated. The MPIRG argues that consideration of declining capacity factors, reduced reliability, and reduced total generating

capacity of aging nuclear plants requires that "Need for Generating Capacity" not be a Category 1 issue.

Response: Consistent with its decision to eliminate consideration of need for generating capacity, utility economics, and energy reliability from the license renewal NEPA review, the NRC will not consider plant capacity factors. The NRC recognizes that a renewed license is not a mandate for State and utility officials to operate a facility, but rather the ability to operate if these officials so choose. The decision to operate is made by State and utility officials based on objectives such as economic competitiveness, reliability, and other locally-controlled issues.

Concern Nmbr: NGC.009
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W08.028
Concern: An industry representative asked how the NRC intends to attempt harmonizing its conclusions on capacity requirements with environmental considerations relative to opportunities for air emissions avoidance through fossil plant retirements or anticipated future regulation of greenhouse gas production, carbon budgets, etc.

Response: Consistent with the NRC's decision to not consider need for generating capacity, consideration of capacity requirements relative to fossil fuel air emissions is not appropriate. The environmental impacts of fossil generating technologies, however, are presented in Chapter 8 (formerly Chapter 9 of the draft GEIS).

Concern Nmbr: NGC.010
Topic: Need for Generating Capacity
Subtopic: Determination of need
Associated Comment Nmbr(s): 079.092a
Concern: The State of Vermont indicated that it is incorrect to dismiss renewable resources by claiming that they are not available, as many of these are feasible today. Storage can be installed along with renewable generating equipment to provide baseload service if desirable.

Response: The NRC has revised the GEIS to give consideration to all reasonably viable sources of power in its analyses of alternative energy sources.

Concern Nmbr: NGC.011
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.020a
Concern: The State of Minnesota contends that societal costs must be considered when deciding whether nuclear power generation is needed. This approach includes both the internal and external costs of a project. For example, the cost to society of bearing the risk of nuclear power

is an external cost that the State of Minnesota believes is appropriate to apply when comparing alternatives to nuclear power generation.

Response: The NRC agrees with the commenter that societal costs (i.e., environmental impacts) are appropriate for the NRC to consider; however, it does not agree that they should be considered for the purpose of determining whether nuclear power generation is necessary. Since the NRC's position is that license renewal is not a mandate for a plant to operate, but rather provides the opportunity for State and utility officials to operate the plant if they so choose, any NRC determination on whether a plant is necessary would be interfering with State and utility officials' authority. Hence, from an environmental perspective, the NRC will limit its decision on whether to grant a renewal permit to a consideration of the environmental impacts of license renewal as compared with those expected from the set of reasonable alternatives for meeting power generation requirements. This consideration of environmental impacts will include the societal costs associated with continued power generation using nuclear power as well as using other generation sources. The NRC would deny a renewal if the environmental costs for nuclear power plant production were significantly worse than those for other alternatives. Thus, the NRC's review of the environmental impacts of license renewal are for the purpose of determining whether license renewal is a reasonable means of generating power to meet a State's determined power generation needs. The issue of whether a State needs any power or has a need for the plant is not a consideration for the NRC.

Concern Nmbr: NGC.012
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 005.003
Concern: A private citizen disagreed with the GEIS conclusion that license renewal will meet the needs for generating capacity. He believes that license renewal does not guarantee generating capacity. He cited the case of Yankee Rowe, which stopped operating after applying to the NRC for a license extension, thus causing a loss of generating capacity. He believes that the stoppage would have happened even if license renewal had been granted.

Response: The NRC agrees with the commenter that license renewal will not guarantee generating capacity. However, it is not the NRC's intent to guarantee generating capacity. License renewal will only provide State and utility officials the option of using this generating source if it continues to meet their reliability, economic, diversity, and other objectives. Yankee Rowe provides an example of where continued operation of a nuclear power plant did not meet these objectives.

Concern Nmbr: NGC.013
Topic: Need for Generating Capacity
Subtopic: Determination of need
Associated Comment Nmbr(s): 087.115 087.116
Concern: The EPA does not see the relevance of the direct economic benefit of generating capacity for a NEPA review process. The need for capacity sets the premise for the remainder of the EIS: what are the impacts of the alternative means to meet the need (and of the no action

alternative). It means little to say that the relicensing alternative has the benefit of meeting this need. The other alternatives are also selected to meet this need and, therefore, should have this benefit.

Response: The NRC agrees with the EPA that there is little relevance to showing direct economic benefit of generating capacity since all generating capacity alternatives will provide this benefit. The NRC has eliminated the economic cost-benefit analysis and has limited its NEPA review to a consideration of the environmental impacts of license renewal compared with alternative energy sources.

Concern Nmbr: NGC.014
Topic: Need for Generating Capacity
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 005.004
Concern: A private citizen noted that the analysis and the benefit from license renewal is based on 10 CFR 51.53 and 51.95 that eliminate the requirement for nuclear reactors to consider need for power and alternative energy sources at the operating licensing stage. He believes we are looking at the "operating license renewal stage" and not the "operating license stage" and these items bear consideration. Additionally, he believes license renewal would not have such a large benefit if sources, other than construction and operation of new (nuclear reactor) generating facilities, were added into the need for generating capacity decision.

Response: The NRC agrees that alternative sources of energy must be considered, and with the commenter's distinction between the license renewal and operating license stages. The NRC will consider the environmental impacts of alternative energy sources in its site-specific license renewal review. The revised GEIS (Chapter 8) contains a discussion of the environmental impacts of alternative energy sources, based on current information. This information will be available for use by the NRC and the licensee in performing the site-specific analysis of the alternatives. The NRC, however, disagrees with the commenter that a consideration of need for power is necessary. Since a renewed license merely provides an option for States and utility officials to generate the power they determine they need, the benefit (generation of a certain amount of electric power) is the same for all sources of power chosen. Therefore, the NRC's decision should be focused on consideration of the environmental impacts associated with these sources rather than on the "need for power".

C-11. Topic: Postulated Accidents (POA)

Postulated Accidents (POA)

Concern Nmbr: POA.001
Topic: Postulated Accidents
Subtopic: SAMDAs
Associated Comment Nmbr(s): W09.001
Concern: An Oregon Department of Energy representative does not believe that an operating plant will undergo the same scrutiny regarding requirements for retrofits during its application for renewal as it did during its original operating license. For example, the Trojan plant in Oregon was built in the early 1970s, and the understanding of the potential magnitude of a major seismic event in the Pacific Northwest is considerably greater now. Since the plant would be built to a higher earthquake standard if it were to be built today, the commenter believes that license renewal is a good time to examine plant retrofits that would upgrade the plant to meet current technology. Consequently, the assumption of not considering SAMDAs during license renewal may not be valid.

Response: This comment addresses the issue of whether plants should be required to meet current design requirements at the time of license renewal. This question was extensively debated within the rulemaking process for 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." A full discussion of this issue within its safety context can be found on page 64945 of the *Federal Register,* Vol. 56, No. 240, dated December 13, 1991. Very briefly, the NRC concluded that "ongoing regulatory processes provide reasonable assurance that, as new issues and concerns arise, measures needed to ensure that operation is not inimical to the public health and safety and common defense and security are 'backfitted' onto the plants." It is important to note that such ongoing regulatory processes take care of safety issues as they are identified, since issues, such as vulnerability to seismic events, are important for the current operating period as well as license renewal. This is not an issue for the NEPA discussion since the existing processes, coupled with the safety review conducted at the time of license renewal in accordance with 10 CFR Part 54, will ensure that plants continue in the future to have a severe accident profile similar to plants today. Older plants have, for example, been reviewed and upgraded to ensure that vulnerabilities to seismic events are corrected and that protection of public health and safety is maintained. Some changes have been made in the text of the GEIS to highlight the Individual Plant Examination (IPE) process for the external event specifically mentioned in this comment. A search for vulnerabilities to seismic events, including those beyond the design basis, has been included in the external event analysis.

Additionally, since the ongoing regulatory program related to severe accident mitigation (i.e., IPE/IPEEE [Individual Plant Examination of External Events]) has not been completed for all plants, and since consideration of severe accident mitigation alternatives has not been included in an EIS or SEIS related to plant operations for all plants, it would be premature to conclude that severe accident mitigation alternatives have been considered generically for license renewal. Thus, the issue of severe accidents must be reclassified as Category 2, requiring a site-specific review of severe accident mitigation alternatives at license renewal for those plants for which such review has not been perfomed.

Concern Nmbr: POA.002
Topic: Postulated Accidents
Subtopic: Severe accidents
Associated Comment Nmbr(s): W09.005 W09.015 054.080
Concern: Representatives from the YAEC and the Illinois Department of Nuclear Safety, and the MDPS indicated several areas where they believe that the text in Chapter 5 should be expanded. Specifically, (1) the message that the severe accident analysis is a bounding one needs to be brought out more in the section and in the summary, so that a reader will understand that it does not represent a realistic assessment of plant risks; (2) the discussion of uncertainties in Section 5.3.5 dealing with external event vulnerabilities should indicate that nuclear power plants are now engaged in the IPE effort, and that these external event vulnerabilities will be studied over the next few years; (3) the GEIS should also indicate that interdiction may not be an easy thing to accomplish when it is identified as a means of addressing plants that are outside the bounds of the Fermi analysis; and (4) the GEIS should provide a basis for limiting the assumed effect of a nuclear accident to one year (see p. 5-91, cost analysis). The MDPS representative also noted that the GEIS fails to take into consideration the specific land use in particular States and the financial implications of the public's perception of the quality of life. Generalized severe accident analysis can be expected to mask significant land use anomalies near specific nuclear plants.

Response: The severe accident analysis in Chapter 5 of the draft GEIS was not intended to be a bounding analysis, but rather, to present reasonable, plant-specific estimates of the impacts of severe accidents. (This issue is addressed in detail in the response to POA.004.)

The text of Section 5.4.1.2 includes specific mention of the external event analysis within the IPEEE program. In addition, Section 5.3.4.3 has been modified to include a recognition that interdiction may actually be different from that desired, given the protective action guidelines, for both the atmospheric pathway (where interdiction is specifically accounted for in the analysis) and the groundwater pathway (where interdiction is discussed in general terms).

With regard to the concern about calculating costs for a one-year period after an accident, the economic analysis in the GEIS was not intended to be an absolute estimate of the actual and total economic costs of a severe accident. Rather it was to promote consistent data and input by providing information for each plant.

Land usage is accounted for in the GEIS analysis through the exposure index (EI) calculations. Embedded in the calculations are the residential populations within a 50-mile radius of each plant, the availability of roads and shelters for emergency planning and evacuation, and the costs for subsequent decontamination. Recent enhancements to the EI methodology now assume a greater contribution from land interdiction and crop disposal costs in the economic analysis. As discussed in Section 5.3.3.5 of the GEIS, the predicted conditional land decontamination from a severe accident is relatively small (at the most 10 acres/yr). The amount of land that could be contaminated was determined in the original FEISs for 6 plants. Based on the NRC's decision to prepare a site-specific SEIS for each license renewal application, mitigation of the impacts of severe accidents on land use will be considered on a site-specific basis. Hence, any significant land use anomalies at a specific site will be considered at that time. As for the financial

implications of the public's perception of the quality of life, this is a "normative" issue, which embodies value judgments dependent on one's point of view.

Concern Nmbr: POA.003
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W09.003 W09.004 W09.011 087.102 096.004
Concern: Several commenters had questions regarding the approach and assumptions used in the postulated accident analysis. The EPA questioned whether sedimentation processes are accounted for in the residence times (see Table 5.14b, p. 5-52), and if not, whether such processes could affect the results of the analyses. The State of New Jersey commented that it is not evident in the GEIS how NRC staff used the relevant risk information from NUREG-1150, "*Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants*" (p. 5-19, lines 13–14). The GEIS should clarify if the statement refers to Table 5.11, where a comparison is made between the early and latent fatality estimates presented in the GEIS and those presented in NUREG-1150.

Representatives from YAEC and NUMARC identified three areas in Chapter 5 of the GEIS where additional clarification was needed in the text. Specifically, (1) the criteria for including sites in Table 5.15 (which lists plants where the drinking water pathway is not bounded by Fermi 2) is not clear because the text implies that the criteria are the surface area-to-volume ratio of the receiving water bodies and residence time, and yet some of the sites listed have very short residence times compared to Fermi 2; (2) why the edible food harvests provided in Table 5.16 list a larger aquatic food harvest for small rivers than for large rivers is not clear; and (3) the relationship between the terms "small" and "insignificant" as they are used in the GEIS is unclear and should be provided.

Response: The Fermi analysis applied the Completely Mixed Lake Model with Bottom Sedimentation. Because linear relationships were assumed between the results of the Fermi analysis and the sites analyzed in the GEIS, the results implicitly assume sedimentation. The text of the GEIS in Section 5.3.3.3.1 has been modified to describe this. The GEIS uses the information developed for NUREG-1150 in two places. First, as the commenter notes, to make the comparison presented in Table 5.11; and second, to evaluate the uncertainty in source terms as discussed in Section 5.3.5.2. The comparison presented in Table 5.11 was provided to illustrate the conservative nature of the GEIS analysis utilized in Chapter 5 to estimate the consequences of atmospheric releases. A change has been made to clarify these points.

Although residence times for small river sites in Table 5.15 may be as much as a factor of 10 less than Fermi, surface-area-to-volume ratios are as much as a factor of 6 greater. Because of inherent uncertainties in comparing the small river sites with Fermi, the difference between the combined values for small river sites and Fermi values was sufficiently small that the sites in Table 5.15 could not be considered to be bound with certainty by the Fermi analysis. The text has been revised.

The data in Table 5.16 were obtained from the Liquid Pathway Generic Study (LPGS) (NUREG-0440) and normalized to an assumed 160 km (100 mi) river length (80 km upstream and downstream of the reactor site). It was further assumed that the aquatic food harvest was uniformly distributed throughout the potential harvest area. The LPGS does not provide an

explanation for a larger aquatic food harvest from small rivers than from large rivers; however, a comparatively larger recreational harvest is implied in the LPGS data. In the LPGS definition, the only large rivers in the nation are the lower portion of the Columbia River and the lower portion of the Mississippi River. The aquatic food harvest (kg/km) from these water bodies is less than from other rivers commonly thought of as "large" in other contexts (e.g., Ohio, Missouri, or Tennessee River) which supply a comparatively larger recreational harvest, in particular.

The term "insignificant" was used in Section 5.3.3.3.2 to mean small. "Insignificant" has been replaced by "small" to eliminate this source of confusion.

Concern Nmbr: POA.004
Topic: Postulated Accidents
Subtopic: Categorization
Associated Comment Nmbr(s): W09.006 W09.009 W09.010 054.072 054.073 087.096 087.100 087.104 087.105
Concern: The EPA commented that the use of a single "generic" source term for each of the two plant types hardly seems to satisfy the expressed intent to perform a bounding analysis using plant and site-specific data. Without bounding the impacts or establishing the envelope, it is not possible to conclude that the impacts are addressed by the GEIS once and for all (i.e., Category 1). The EPA suggested that the NRC consider reclassifying severe accidents to Category 2. Once IPEs have been completed, each licensee could determine whether the plant-specific source terms and core melt frequencies derived in the IPE fall within the bounds of the generic Reactor Safety Study (RSS) source terms and core melt frequencies used in the GEIS. The EPA also brought up the same concern in relation to assessments of economic impacts, atmospheric releases, and fallout onto open bodies.

The MDPS noted that the GEIS's conclusion that the environmental impacts of postulated accidents are small at all sites is inconsistent with the NRC's own recognition that many plants do not fall within the bounds of the parameters used in the studies cited in the GEIS to support the finding of small impact for postulated accidents. Specifically, the agency noted that Monticello and Prairie Island were shown in Tables 5.15 and 5.30 to be not bound in the liquid pathway study and in the surface water analysis. Thus, the GEIS's generic findings cannot be applied to the environmental situation of all individual nuclear plants. Additionally, the agency pointed out that the GEIS accident analysis for "large water sites" fails to account for site-specific differences among nuclear plants. Specifically, the Prairie Island and Monticello plants are much closer to the Mississippi River (150 meters) than the two river sites chosen for the analysis (Grand Gulf and River Bend), potentially leading to different pathways for the contamination. That is, contamination of the groundwater might be more likely for sites farther from the river, while damage to the river itself might be more likely for sites closer to the river. In addition, the danger of accidents due to flooding could be very different for those plants nearer the river. Thus, the analysis of postulated accidents is site-specific.

A lawyer and a representative from an engineering consulting firm (SC&A) commented that the characterization of severe accidents as a Category 1 issue may not be appropriate. The lawyer questioned whether the analysis in Chapter 5 encompassed all 118 plants. The SC&A representative indicated that the thrust of the effort to perform a realistic NEPA analysis instead of a fully bounding analysis precludes a Category 1 determination. Additionally, he believes that a

bounding analysis could be done if plant-specific risk analyses were performed for every plant, but that has not been accomplished. The commenter suggested that if severe accidents were reclassified as a Category 2 issue, two options for establishing bounding criteria are: (1) plants lacking an individual risk analysis could be required to supply one as part of their relicensing application, or (2) SAMDAs would could be considered for all sites above the "safety goal policy statement" derived values resulting from IPEs and IPEEEs.

Response: The use of a generic source term for all plants (one for BWRs and one for PWRs) in the GEIS is consistent with past practice in individual plant FEISs. In fact, all 27 plant-specific FEISs that contained severe accident analyses used these same generic source terms. The purpose of the source term discussion in the GEIS is to describe whether new source term information (developed since the completion of the last FEISs) indicates that the generic source terms used may under-predict environmental consequences, and thus, should not be used for the analyses.

NRC staff has looked at the new source term information developed over the past 10 years and has concluded that the expected frequency and amount of radionuclide release to the environment under severe accident conditions is less than that predicted using the generic source terms from the FEIS analyses. The reasons for this are twofold. First, research results have provided more detailed information on the amount, chemical form, and removal processes associated with radionuclide release. A good summary of the evolution of this research is provided in NUREG-0956, *Reassessment of the Technical Basis for Estimating Source Terms*. Second, more detailed plant analyses have better quantified the accident scenarios, including their estimated frequency and timing. The NUREG-1150 report and the La Salle Probabilistic Risk Assessment (PRA) report (NUREG/CR-5305) are good examples of this.

The effect of considering this new information is illustrated in Tables 1 and 2 where the generic source terms used in the GEIS are compared to the most severe source terms for similar accident sequences from the NUREG-1150 plants (i.e., Zion-PWR) and La Salle-BWR, respectively. Source term estimates representing a similar set of accident progression events can vary by many orders of magnitude due to phenomenological uncertainties. For example, Figure 5.5 in NUREG-1150 shows that release fractions for various radionuclides at the Sequoyah plant can span an uncertainty range of 2 to 4 orders of magnitude. Nevertheless, the source terms used in the GEIS analysis are typically more severe than the NUREG-1150 or La Salle source terms, and in all cases, are well within the uncertainty bounds associated with the analyses.

The information from the IPEs reviewed to date also confirms the conservatism in the source terms used in the GEIS. In addition, for those IPEs that reported plant/site-specific offsite consequence information (only several IPEs did this since it was not required), the results confirm the conservatism of the GEIS analysis. Examples of these results, as compared to the analysis presented in the GEIS, are shown in Table 3.

Although one could use the IPE source term information in the manner suggested by the EPA, such use would be contrary to the intent of the IPE and could unnecessarily lead to litigation of IPEs in an area for which they were never intended. The values for each plant obtained through the above process represent reasonable, plant-specific estimates of the impacts from severe accidents. The risks of severe accidents as determined through these plant-specific analyses are consistently small.

However, based on the comments received, the NRC has reconsidered its previous conclusion in the draft GEIS concerning the site-specific mitigation of severe accidents. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. Thus, the severe accidents issue is now Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed. The NRC's reconsideration of severe accident mitigation alternatives for license renewal is based on its NEPA regulations requiring a consideration of mitigation alternatives in the EISs and SEISs, as well as on a previous court decision that required a review of severe accident mitigation alternatives (then referred to as SAMDAs) at the operating license stage (*Limerick Ecology Action v. NRC*, 869 F.2d 719 [3rd Cir. 1989]). Moreover, the following programs related to severe accidents have not been completed for all plants: (1) containment improvements for all plants pursuant to the Containment Performance Improvement (CPI) program, identifying potential containment improvements for site-specific consideration by licensees; and (2) regulatory program whereby licensees identify individual plant vulnerabilities to severe accidents and consider cost-beneficial improvements. Hence, a conclusion that severe accident mitigation alternatives have been considered generically for license renewal is premature.

Table 1

Comparison of PWR Source Terms

	Containment Bypass		LOCA w/ ECCS Failure	
Release Category	GEIS	1150	GEIS	1150
Probability per RY (yr^{-1})	2.00E-06	2.3E-06	4.00E-05	3.05E-04
Time of release after shutdown (hr)	1.00E+00	1.0E+00	1.00E+01	6.0E+00
Release duration (hr)	1.00E+00	2.0E+00	1.00E+01	2.4E+01
Warning time before release (hr)	5.00E-01	6.6E-01	1.00E+00	1.0E+00
Release height (m)	1.00E+01	3.0E+01	1.00E+00	3.0E+01
Release fractions Noble gases (Kr, Xe)	1.00E+00	1.0E+00	6.00E-03	5.0E-03
I	6.40E-01	1.15E-01	2.00E-05	3.0E-05
Cs	8.20E-01	1.2E-01	1.00E-05	2.4E-08
Te	4.10E-01	7.0E-02	2.00E-05	1.5E-08
Sr–Ba	1.00E-01	2.5E-02	1.00E-06	5.0E-09
Ru	4.00E-02	1.0E-03	1.00E-06	4.0E-10
La–Ce	6.00E-03	3.0E-03	2.00E-07	6.0E-10

Table 2

Comparison of BWR Source Terms

Release Category	Transient, FW, HPIC, ECCS Failure		Transient, Late Containment Failure	
	GEIS	NUREG/ CR 5305	GEIS	NUREG/ CR 5305
Probability per RY (yr^{-1})	3.0E-07	4.8E-06	1.0E-05	1.7E-05
Time of release after shutdown (hr)	2.0E+00	7.5E+00	5.0E+01	7.5E+00
Release duration (hr)	5.0E-01	6.25E+00	2.0E+00	6.25E+00
Warning time before release (hr)	1.0E+00	1.27E+00	4.0E+01	1.3E+00
Release height (m)	1.0E+01	3.0E+01	3.0E+01	3.0E+01
Release fractions Noble gases (Kr, Xe)	1.00E+00	1.00E+00	1.00E+00	1.00E+00
I	9.5E-02	9.8E-02	3.0E-03	8.9E-02
Cs	3.0E-01	1.0E-01	1.1E-02	7.7E-03
Te	3.6E-01	8.4E-02	8.3E-02	1.0E-02
Sr–Ba	3.4E-02	5.2E-02	1.1E-02	5.5E-03
Ru	2.7E-02	2.1E-03	7.0E-03	8.9E-05
La–Ce	5.0E-03	4.2E-03	1.0E-03	4.1E-04

Table 3

Comparison of IPE Internal Event Results to GEIS
(for those IPEs with offsite information)

Plant	Early Fatalities	Latent Fatalities	Person-Rem
1) Yankee Rowe:			
• IPE	1.7×10^{-9}/RY	2.2×10^{-4}/RY	4.4/RY
• GEIS	3.3×10^{-3}/RY	6.7×10^{-2}/RY	872/RY
2) McGuire:			
• IPE	5.2×10^{-7}/RY	8.4×10^{-4}/RY	12.5/RY
• GEIS	1.0×10^{-2}/RY	1.4×10^{-1}/RY	1806/RY
3) Oconee:			
• IPE	5.2×10^{-6}/RY	1.3×10^{-3}/RY	20/RY
• GEIS	1.1×10^{-2}/RY	1.0×10^{-1}/RY	1311/RY
4) Catawba:			
• IPE	1.0×10^{-5}/RY	1.4×10^{-3}/RY	22.4/RY
• GEIS	1.7×10^{-2}/RY	1.4×10^{-1}/RY	1880/RY

Concern Nmbr: POA.005
Topic: Postulated Accidents
Subtopic: SAMDAs
Associated Comment Nmbr(s): W09.007 063.014
Concern: A lawyer questioned why SAMDAs are treated as a separate issue and not just subsumed into the severe accident issue, which was characterized as Category 1. This treatment appears to be inconsistent with the GEIS methodology regarding severe accidents. Since the impact for severe accidents was found to be small, the methodology states that consideration of mitigative actions is not warranted when the impact is small. Additionally, it is inconsistent with other mitigation or mitigative actions associated with environmental impacts that are not given a separate category.

Although NUMARC supported the NRC's position that SAMDAs need not be considered in individual license renewal applications, it strongly recommended that the NRC refocus the discussion in the GEIS. NUMARC indicated that additional effort is needed to justify that mitigation measures can be evaluated generically. NUMARC believes that the NRC cannot rely on the 1980 Policy Statement as the basis for its position regarding SAMDAs because the original purpose of the Statement is no longer germane. Instead, the GEIS should describe more comprehensively the data related to and supporting the NRC finding that severe accidents pose only a small risk, and that individual plant analysis of SAMDAs is neither necessary nor appropriate. Additionally, the NRC should consider the Limerick case in which the courts suggested that SAMDAs cannot be treated generically and should explain in the GEIS how the technical evaluation conducted was consistent with the guidance set out in the Limerick case.

Response: Regarding the initial determination of SAMDAs as a Category 1 issue, the NRC has reconsidered its previous conclusion in the draft GEIS. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. However, a SAMDA review is no longer considered a separate issue, but rather as a mitigation measure related to severe accident. Thus, the severe accidents issue is now Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed. The NRC's reconsideration of severe accident mitigation alternatives for license renewal is based on its NEPA regulations requiring a consideration of mitigation alternatives in the EISs and SEISs, as well as on a previous court decision that required a review of severe accident mitigation alternatives (then referred to as SAMDAs) at the operating license stage (*Limerick Ecology Action v. NRC*, 869 F.2d 719 [3rd Cir. 1989]). Moreover, the following programs related to severe accidents have not been completed for all plants: (1) containment improvements for all plants pursuant to the CPI program, identifying potential containment improvements for site-specific consideration by licensees; and (2) regulatory program whereby licensees identify individual plant vulnerabilities to severe accidents and consider cost-beneficial improvements. Hence, a conclusion that severe accident mitigation alternatives have been considered generically for license renewal is premature.

Based on insights developed through completion of the CPI program, the performance of several plant-specific SAMDA reviews, and the results to date from the ongoing regulatory program related to severe accidents, the NRC believes it unlikely that any site-specific review of SAMDAs

for license renewal will identify major plant design changes or modifications that will prove cost-beneficial for reducing severe accident risk or consequences.

Concern Nmbr: POA.006
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): W09.008
Concern: An industry lawyer indicated that there is an outstanding SECY paper that says without qualification that SAMDAs cannot be addressed for advanced LWRs on a generic basis. He stated that this could be viewed by some as also being applicable to current LWRs.

Response: Contrary to the thrust of this comment, the statement in the SECY paper was indeed qualified. First it should be noted that this SECY paper was directed toward the treatment of SAMDAs for future plants in the design certification process. The full quotation from SECY-91-229, dated July 31,1991, is: "The staff does not believe that the SAMDAs can be dealt with in a generic fashion for all designs, because of the differences between BWRs and PWRs, the types of containments, and other significant differences between designs that would influence the type of alternatives to be considered." Following its plant-specific conclusion that severe accident impacts will be small during the license renewal period, the NRC dealt with the types of differences discussed in the quotation in Section 5.4, where the generic conclusion about SAMDAs is discussed. Specifically, Section 5.4.1.2.1 and Tables 5.32, 5.33 and 5.34 of the draft GEIS discuss potential containment improvements considered within the CPI program, by containment type. Section 5.4.2 and Tables 5.35 and 5.36 discuss the results of existing SAMDA evaluations for a BWR and a PWR. These evaluations, along with the existing processes discussed in the rest of Section 5.4 (which ensure that improvements to plants are made when warranted), account for the differences discussed in the SECY paper.

However, based on the comments received, the NRC has reconsidered its previous conclusion in the draft GEIS concerning the site-specific mitigation of severe accidents. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. Thus, the severe accidents issue is now a Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed. The NRC's reconsideration of severe accident mitigation alternatives for license renewal is based on its NEPA regulations requiring a consideration of mitigation alternatives in the EISs and SEISs, as well as on a previous court decision that required a review of severe accident mitigation alternatives (then referred to as SAMDAs) at the operating license stage (*Limerick Ecology Action v. NRC*, 869 F.2d 719 [3rd Cir. 1989]). Moreover, the following programs related to severe accidents have not been completed for all plants: (1) containment improvements for all plants pursuant to the CPI program, identifying potential containment improvements for site-specific consideration by licensees; and (2) regulatory program whereby licensees identify individual plant vulnerabilities to severe accidents and consider cost-beneficial improvements. Hence, a conclusion that severe accident mitigation alternatives have been considered generically for license renewal is premature.

Concern Nmbr: POA.007
Topic: Postulated Accidents
Subtopic: Emergency preparedness
Associated Comment Nmbr(s): W09.014
Concern: A representative from an engineering consulting firm (SC&A) commented that the primary purpose of the GEIS is to resolve issues that can be resolved. While the GEIS must defend both its generic findings as well as satisfy NEPA requirements, the commenter believes that the defense of the generic table (Table 10.1 of the proposed rule) is more important.

Response: The primary purpose of the GEIS is to evaluate environmental impacts of the proposed action pursuant to NEPA requirements. The NRC is using the method of including the full disclosure analyses in the GEIS and the conclusions about generic applicability in the rule.

Concern Nmbr: POA.008
Topic: Postulated Accidents
Subtopic: Analysis of issues
Associated Comment Nmbr(s): W04.020 W09.012 010.009 054.078
Concern: Several commenters were concerned about accidents involving spent fuel. A representative from the MDH is concerned about the establishment of spent fuel storage installations that many plants will need to set up, and their impact on emergency preparedness plans. He believes that people are more concerned about effective emergency plans than about day-to-day operations, and that the States will need to address the emergency preparedness issue with respect to in-plant dry cask storage. He questioned whether this issue should be folded into plant operations, or be assessed separately.

A public interest group (NU-END) commented that the risk of a spent fuel pool accident is enhanced by the presence of a large amount of spent fuel and by the combination of operating an aged reactor and storing HLW at the same site.

The State of Minnesota also commented that the GEIS erroneously states that spent fuel is handled and stored under water, citing page 5-9, lines 19 and 20. They suggest that this ignores the fact that plants are already beginning to use dry cask storage.

Response: The plans for offsite emergency preparedness that have been developed based on consideration of reactor accidents should not be impacted by the future installation of onsite spent fuel storage (dry cask) facilities. However, the location of such facilities would probably be noted in the facility's emergency plans. Because of the significantly reduced radioactive inventory in the fuel stored in those facilities, accidents in storage facilities should be much slower in developing than accidents in operating reactors, and therefore, the plans made for reactor accidents should be applicable to storage facilities. (Offsite dry cask facilities are governed by licensing requirements contained in 10 CFR Part 72. The design and safety of those facilities are not part of the license renewal effort and are beyond the scope of the GEIS.) As noted in Chapter 6 of the GEIS, operational incidents involving spent fuel pools have occurred only infrequently and with low safety significance. Enhanced inspection and enforcement actions as a result of these events have been instituted to ensure against their occurring again. The NRC requires reactor licensees to ensure against inadvertent criticality by limiting quantities of fuel stored in a given pool and by

regulating the configuration of fuel bundles. Relative to the concern about an interaction between reactor operation and fuel storage, the commenter did not give a suggested method by which this interaction could occur. From a safety point of view, the full capacity of the spent fuel pool has been evaluated during licensing.

The cited lines for the statement that spent fuel is handled and stored under water, which the commenter believes to be erroneous, refers to the fuel-handling structures of the plant. In that context, the statement is correct. Chapter 6 of the GEIS addresses the use of dry cask storage at ISFSIs. The commenter correctly notes that many licensees are now utilizing such installations.

Concern Nmbr: POA.009
Topic: Postulated Accidents
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W10.001 W10.002 W10.003 010.002 010.003 043.005 054.077b 081A.010 096.006 A113.003 106.003
Concern: Public interest group representatives from Don't Waste U.S., NU-END, the FCSE, and the NIRS; the Deerfield River Compact; the States of New Jersey and Minnesota identified three concerns which they believe justify severe accidents being addressed in the GEIS as a Category 3 issue. The first is seismic risks to nuclear power plants since these risks are site-specific and the estimates change over time as the understanding of the event increases. (The presence of seismic faults [3 in the Maine area] warrant that the risks from earthquake-induced damage be evaluated as a Category 3 issue.) The second concern is evacuation risks, citing the decision not to operate Shoreham as the basis for their concern. Evacuation plans should be a Category 3 issue because these plans are inadequate and particular nuclear plants, like Monticello, presents site-specific population density differences from other nuclear plants. Potential shortcomings of existing plans may include incorrect estimates of population density, corridor pathways, protection of ingestion pathways, reception pathways, faulty management of evacuation planning, and faulty alarm systems. Shifts in population density and in fixed geographic factors that have occurred since the original license was issued could affect the adequacy of current evacuation capabilities. The third concern is threats to the reactor site from adjacent sources and vice versa, an example being the operating environment of the Vogtle plant, which could be affected by the Savannah River Weapons Plant.

Response: The GEIS provides an analysis of the consequences of a severe accident at each site in the country. This analysis adopts standard assumptions about each site, such as evacuation speeds, distance traveled, etc., but uses an independent estimate of population. The methods used resulted in predictions of reasonable risk, yet these risks are only a small fraction of the risks to which the public is exposed from other sources. The GEIS methodology, as discussed in Section 5.3.3.2.1, is considered to provide conservative (i.e., overestimated) projections of risk. This conservatism was intentional and was used in the GEIS in order to ensure that the actual risk would not be
larger than the predicted risk for that plant. Therefore, site-specific characteristics, such as possible errors in a plan, should have little effect on the conclusions reached in this document.

Seismic events and hazards to the plant from nearby facilities will be examined for all the plants as part of the IPEEE process, which is currently in progress. Such severe accident concerns as

arise during the performance of the IPEEE will be evaluated as they are identified without waiting for license renewal. As the name implies, the IPEEE process includes plant-specific attributes. In the case of seismic events, site-specific attributes are accounted for. The choice of the magnitudes of beyond-the-design-basis seismic events has been based on the best possible information, as discussed in NUREG-1407, *Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities*, dated June 1991. In the case of hazards from nearby facilities, NUREG-1407 also provides screening procedures for evaluating the impact of near-by facilities. This review considers the licensing basis of the plant, the existing SRP criteria, and a certification that no other plant-unique external event is known that poses any significant threat. Although the IPEEE is a one-time evaluation, the NRC has in place a process that ensures that if new information affecting plant safety develops, its applicability to existing plants is evaluated and action is taken, if warranted. Relative to the second concern, the risk to persons as they evacuate is taken into account in a simplified manner in the Consequence (of) Reactor Accident Code (CRAC) analyses. This issue and its contribution to uncertainty are already discussed in the GEIS in Section 5.3.3.2.1 under the heading "Emergency Planning" and in Section 5.3.4.3 under the heading "Emergency Response Effectiveness and Warning Time." In addition, it should be noted that 10 CFR Part 50 requires that licensees maintain up-to-date emergency plans and this requirement will, of course, apply in the license renewal period.

The likelihood of an earthquake is evaluated in the Safety Analysis Report. The plant must meet the defined safety requirements. However, the consequences of such an event would not be expected to be any more severe than those which would be experienced for the more severe releases due to internal initiators. Risk due to external initiators will also be examined in the IPEEE process discussed above (see Section 5.4.1.2).

Evacuation plans exist for each site. These must be updated on a regular basis by law. In the GEIS, the NRC assumed that regular updating of the evacuation plans would account for changes in parameters that affect evacuation from the vicinity of the plant. Parameters, such as evacuation speed, distance to which that evacuation occurs, population affected, medical care, and type of sheltering, are all included in the CRAC calculation for each FEIS plant site.

However, based on the comments received, the NRC has reconsidered its previous conclusion in the draft GEIS concerning the site-specific mitigation of severe accidents. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. Thus, the severe accidents issue is now a Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed. The NRC's reconsideration of severe accident mitigation alternatives for license renewal is based on its NEPA regulations requiring a consideration of mitigation alternatives in the EISs and SEISs, as well as on a previous court decision that required a review of severe accident mitigation alternatives (then referred to as SAMDAs) at the operating license stage (*Limerick Ecology Action v. NRC*, 869 F.d 719 [3d Cir. 1989]). Moreover, the following programs related to severe accidents have not been completed for all plants: (1) containment improvements for all plants pursuant to the CPI program, identifying potential containment improvements for site-specific consideration by licensees; and (2) regulatory program whereby licensees identify individual plant vulnerabilities to

severe accidents and consider cost-beneficial improvements. Hence, a conclusion that severe accident mitigation alternatives have been considered generically for license renewal is premature.

Concern Nmbr: POA.010
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 059.004
Concern: The Environmental Protection Division of the Massachusetts Office of the Attorney General commented that the severe accident analysis is flawed in that only by evaluating what would occur if a severe accident happened at a particular site could one know the consequences of such an accident. Even the limited analysis that is engaged in by the GEIS focuses only on the small risk of an accident, without including the sizable environmental and public health consequences if such an accident were to occur.

Response: The GEIS presents values of risk (probability of an accident times the consequences of that accident) for each site. The EI method, discussed in Section 5.3.3.2.1 of the draft GEIS, was used to account for the major site-specific parameters of population distribution and wind direction. The premise of the commenter that "sizable" consequences follow every severe accident is not correct since some severe accidents, such as the one at TMI Unit 2, have negligible offsite consequences. Therefore, it is not proper to focus on the largest of the potential consequences, but emphasis should be given to the balance of magnitude and probability. As far as the sizable consequences of severe accidents is concerned, the GEIS includes a discussion of the Adverse Health Effects (Section 5.2.1.4) associated with radiation exposure as well as a discussion of the observed impacts from accidents to date, both in this country and abroad (Section 5.2.2). These discussions address the known sizeable and potential consequences of severe accidents.

Concern Nmbr: POA.011
Topic: Postulated Accidents
Subtopic: SAMDAs
Associated Comment Nmbr(s): 005.008 035.010 061.007 064.009
Concern: Several responses were received to question 3 on page 47025 of the *Federal Register* notice in relation to the GEIS assumption that SAMDAs do not need to be considered in individual plant licenses. A private citizen and the OCRE both cited the case of *Limerick Ecology Action v. NRC*, which was remanded back to the NRC for consideration of SAMDAs, and which found that NEPA required case-specific consideration of SAMDAs. The private citizen noted that SAMDAs are dealt with through a policy statement that does not represent the requisite careful consideration of the environmental consequences. The individual believes that avoiding SAMDAs by citing rulemakings is improper and that SAMDAs should be properly evaluated to protect the public health and safety. The OCRE also believes that SAMDAs should be considered on a case-by-case basis. Additionally, the OCRE noted that severe accident risk will be affected by such plant-specific conditions as plant design variation, local population, and meteorological factors. The OCRE believes that it is important for persons in the vicinity of the site to have the opportunity to comment upon and litigate these matters. The UCS argued that the SAMDA issue must be addressed on a plant-specific basis because it cannot be resolved on a generic basis. Furthermore, UCS noted that the NRC seeks to exclude from the license renewal process the

consideration of both severe accidents and the potential for installing additional safety features to protect against such accidents. No factual justification for this exclusion is given, and this exclusion appears to violate NEPA.

The PDER commented that the apparent conclusion drawn from SAMDA assessments at Comanche Peak and Limerick that SAMDAs at older plants may not contribute to risk reduction seems premature. There are ongoing failures and situations at the plants that could directly affect safety systems.

Response: Regarding the initial determination of SAMDAs as a Category 1 issue, the NRC has reconsidered its previous conclusion in the draft GEIS. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. However, a SAMDA review is no longer considered a separate issue, but rather as an outcome of a severe accident. Thus, the severe accidents issue is now Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed.

Since the ongoing regulatory programs related to severe accident mitigation (i.e., IPE/IPEEE) have not been completed for all plants, and since consideration of severe accident mitigation alternatives has not been included in an EIS or SEIS related to plant operations for all plants, a site-specific review of such alternatives is required at license renewal for those plants for which a review has not been performed. NRC staff evaluations of severe accident mitigation alternatives have already been completed and included in an EIS or SEIS for Limerick, Comanche Peak, and Watts Bar; therefore, they need not be reassessed as part of the license renewal review for these plants. The NRC notes that upon completion of its IPE/IPEEE program, it may revisit the issue of severe accident mitigation for license renewal and consider, by separate rulemaking, reclassifying severe accidents as a Category 1 issue.

Concern Nmbr: POA.012
Topic: Postulated Accidents
Subtopic: SAMDAs
Associated Comment Nmbr(s): 061.009
Concern: The OCRE expressed concern that the $1,000 per person-rem averted criterion in the GEIS is inappropriate because (1) it is not adjusted for inflation, and (2) licensees are willing to spend much more than that amount to avert occupational doses. NUREG-1362 noted industry health physics costs of $8,000 per person-rem averted. Using a higher criteria, additional SAMDAs may well be cost-effective.

Response: The NRC agrees that the dollar per person-rem conversion factor warrants a reassessment, and is currently in the process of updating and codifying this value and its application in NRC decision making. Although this effort is not yet complete, the initial indication is that the conversion factor would increase by less than a factor of 5 from the current value of $1,000.

It is important to recognize that in the SAMDA analysis the dollar per person-rem conversion factor was used as a screening rather than as a decision criterion. The value-impact ratio (in terms of dollars per person-rem averted) was estimated for each design alternative in order to identify and rank those design alternatives offering the greatest risk reduction for the dollar. All design alternatives having a value-impact ratio within a factor of 10 of the $1,000 per person-rem were "screened in", and considered further on the basis of deterministic as well as probabilistic considerations. Because all design alternatives within a factor of 10 have already been evaluated and dispositioned on bases other than cost-benefit, the results of the SAMDA evaluation would not be altered if a higher dose conversion were used.

In NUREG-1362, *Regulatory Analysis for Final Rule on Nuclear Power Plant License Renewal*, dated December 1991, health physics-related costs are included and assessed at the rate of $9,160/person-rem. For a utility, the need for a health physics organization exists for various reasons, which include occupational exposure reduction, improved worker health and moral, and reduced generation of radiological waste. Higher occupational exposures can translate into the need for additional radiation workers, along with the included costs of their training and qualification. It is not appropriate to equate operational costs of a health physics organization within a nuclear power plant with the cost effectiveness of a regulatory action, which must account for property damage costs, such as decontamination and interdiction, as well as the costs of treatment for radiation-induced injuries and associated injury compensations.

Concern Nmbr: POA.013
Topic: Postulated Accidents
Subtopic: Plant aging
Associated Comment Nmbr(s): 010.011 035.007 069.001 088.004
Concern: A private citizen believes that the potential environmental ramifications from a nuclear power plant malfunction are great since the potential for malfunction of any complex mechanical system increases with the wear and tear of time. As nuclear power plants age, they do not become more uniform, rather site-specific differences are magnified with time. NU-END commented that the public should have an opportunity to provide input (at Maine Yankee) on problems relating to premature aging, advanced embrittlement, steam tube problems, ocean water corrosion, and increasing radiation levels to plant components and workers. The Cape Cod Commission is concerned because many of the items deemed "not to be a problem" are so designated based on the performance of existing nuclear power plants, very few of which are older. The blanket statement of no environmental impacts from postulated accidents is naive at best. Likewise the statement that there is a small cost for postulated accidents in plants that will be in excess of 30–40 years old is fallacious. Older plants, such as Yankee Rowe, which could not continue to be operated safely and cost effectively, have shown why the GEIS approach is not appropriate. A GEIS approach to relicensing Yankee Rowe would not even have considered the safety and physical plant integrity issues that were the very ones which permanently closed the facility. The PDER noted that, while the ISTM guidelines are well founded, they are also generic. The development of the ISTM program should be plant-specific. Provisions should be made for NRC inspection and enforcement staff to validate that SSCs have overcome age-related degradation prior to entering the license renewal phase and during the renewed term.

Response: While the commenters' premise that accidents are more likely as a complex

mechanical system ages might be true if the aging effects are not corrected, the safety evaluation of a license renewal application will ensure that the plant will remain within its current licensing basis throughout the renewal term. Refurbishment is likely to be required for almost every plant, as discussed in Chapter 3 of the GEIS, but the extent is likely to vary among plants. It is in recognition of this refurbishment, as well as of the safety review process in place, that severe accident probabilities are not expected to change during the license renewal term. Additionally, the NRC thoroughly addressed the issue of aging of plant systems in 10 CFR Part 54. Continued safe operation of a commercial nuclear power plant requires that structures and components that perform or support safety functions continue to perform in accordance with the applicable requirements in the licensing basis of the plant. The final rule requires each renewal applicant to address the effects of aging through an integrated plant assessment (IPA) that demonstrates that the facility's structures and components requiring aging management review for license renewal have been identified, and that the effects of aging on their functions will be managed to maintain the current licensing basis during the period of extended operation.

The discussions of environmental impacts are predicated on performance of the plant during the license renewal term in a similar manner as during the original term, except for those impacts that are concerned with the refurbishment process itself. Because the current licensing basis will continue to be met during the renewal period, there is no reason to postulate otherwise. As discussed in the GEIS (Chapter 5), the best information available on the risks of accidents is that they are small.

Far from indicating that the license renewal process is not working, the experience with Yankee Rowe shows that the process is working. The decision to shut down the plant was made because the owners believed that continued operation was not economical, in view of the fact that an extensive program was necessary to demonstrate that embrittlement of the vessel was not a safety problem. As in the case of Yankee Rowe, for any issue at any other plant there will be three options: (1) show that the present maintenance activities cover the aging effects in the SSCs important to license renewal, so that the current licensing basis is maintained; (2) institute new maintenance, refurbishment, or replacement activities; or (3) shut down the plant.

Concern Nmbr: POA.014
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 035.008
Concern: The PDER called for a reevaluation of the offsite risk with the extended fuel cycle source term and updated demographic variables. Some plants are considering 2-yr fuel cycles and by the time the license is renewed, a significant number of plants would be on extended fuel cycle.

Response: There may be some nuclear power plants that are exploring the merits of an extended 2-yr fuel cycle, or are beginning to examine the viability of such a plan. There is, however, no current activity on the part of NRC staff to evaluate any such option. If the industry were to propose and justify such a plan, there necessarily would be extensive analysis and assessment prior to any NRC approval or implementation. Such analysis may be performed during the plant's current operating license period, and is not necessarily a requirement unique to license renewal.

Since a site-specific SEIS will be prepared for each license renewal application, plants using the 2-yr fuel cycle at that time will have to present information on the environmental impacts.

Concern Nmbr: POA.015
Topic: Postulated Accidents
Subtopic: Generic safety issues
Associated Comment Nmbr(s): 035.009 093.008
Concern: The PDER and the NECNP commented on this concern. The PDER believes that residual plant life is a major factor in unresolved generic safety issue (GSI) determinations. Such determinations and the resulting plant modifications may have to be reviewed in view of the 20 years of incremental plant life due to license renewal. The NECNP believes that the GEIS did not consider several dozen outstanding GSIs. These generic issues represent existing conditions or practices at nuclear power plants that pose uncertain risk to the public and the environment. It questioned whether the NRC intends to resolve these outstanding concerns before allowing relicensing, or whether the NRC will carry over these problems which, it believes, would be a failure of NRC regulatory responsibility.

Response: GSIs were examined in great detail in conjunction with the final rule for nuclear power plant license renewal (see 56 FR 64947, December 13, 1991). As described in SECY-89-138, the NRC maintains an active program for evaluating and resolving GSIs that may impact public health and safety. A GSI involves a safety concern that may affect the design, construction, or operation of all, several, or a class of reactors or facilities. Its resolution may have a potential for safety improvements and promulgation of new revised requirements or guidance. The prioritization process, as described in NUREG-0933, *A Prioritization of Generic Safety Issues* (NRC, 1987), evaluates the safety significance of an issue and classifies the issue as high, medium, or low priority. Cost-benefit analyses are employed in resolving GSIs involving safety enhancements above the adequate safety level. In these tradeoffs between net safety benefit and net cost, the remaining plant operating term ordinarily enters the calculations.

As part of its efforts toward developing the license renewal rule, the NRC examined the resolved GSIs for possible cases in which consideration of an additional 20 years of operating time during the renewal term might have altered the regulatory decision. Of the 249 GSIs that were resolved through October 1990, 139 did not result in backfit requirements. A screening of these 139 GSIs was conducted, resulting in the identification of three issues which required reexamination relative to the license renewal period. GSI resolution efforts started or in progress after October 1990 examine renewal-term effects as part of the issue resolution process. A more detailed discussion of the reexamination appears in NUREG-1412, *Foundation for the Adequacy of the Licensing Bases* (NRC, July 1990). Details of the screening are reported in NUREG/CR-5382, *Screening of Generic Safety Issues for License Renewal Consideration* (NRC, June 1991).

Concern Nmbr: POA.016
Topic: Postulated Accidents
Subtopic: Severe accidents
Associated Comment Nmbr(s): 064.006 087.097 096.005
Concern: The EPA believes it is not clear that the management of aging through maintenance of

the plant's licensing basis will necessarily maintain the risk from severe accidents at current levels. This issue requires clarification by the NRC. The EPA also brought up the same concern in relation to assessment of economic impacts, atmospheric releases, releases to groundwater, and fallout onto open bodies.

The UCS contends that the NRC has no valid basis for the generic finding in the GEIS that there will not be an increase in the risk of accidents in aging plants. In support of its argument, it contends that (1) the license renewal regulations in 10 CFR Part 54 do not provide adequate protection for public safety, (2) the license renewal regulations contain no technical requirements to support the GEIS claim that license renewal will be the least expensive alternative, and (3) the NRC research program on the effects of aging is in its infancy. Similarly, the State of New Jersey commented that the effectiveness of controls phased in during the renewal period are not currently known, wherein age-related component failure may increase.

Response: The NRC thoroughly addressed the issue of aging of plant systems in 10 CFR Part 54. Continued safe operation of a commercial nuclear power plant requires that structures and components that perfom or support safety functions continue to perfom in accordance with the applicable requirements in the licensing basis of the plant. That rule requires each renewal applicant to address the effects of aging through an IPA that demonstrates that the facility's structures and components requiring aging management review for license renewal have been identified, and that the effects of aging on their functions will be managed to maintain the current licensing basis during the period of extended operation. Additionally, the NRC has in place programs to control and manage aging effects, as required by the maintenance rule, 10 CFR 50.65. Utilities are required to monitor the performance or condition of structures and systems against established goals to provide reasonable assurance that they are capable of perfoming their intended functions. The management of aging is intended to keep the failure rates of equipment at approximately the same levels during the renewal period as they were during the initial licensing. The NRC has and is continuing to fund an extensive research program to assess aging phenomena and to develop effective measures to deal with aging. This aging program is described in NUREG-1144 and a summary of program results to date is provided in NUREG-1377. As these NUREGs indicate, the aging research program is addressing the plant equipment with the most risk significance. This equipment has been selected based upon risk studies (e.g., NUREG/CR-5510). The combined impact of these programs will provide high confidence that significant increases in risk to the public will not arise as a result of aging effects.

The premise for the transition between the current license and the renewed operating license is that regulatory *continuity* will be maintained. It is not anticipated that the plant will operate in one manner until its current license expires and then undergo significant changes in design and operation at the moment of license renewal. Rather, as a plant moves toward relicensing it will incorporate those measures necessary for continuity.

Concern Nmbr: POA.017
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 087.106
Concern: The EPA pointed out that the EI concept, which the GEIS uses to normalize economic

impacts, uses only a met-sector-weighted-population, which is appropriate for assessing public health impacts, but not for economic impacts. Furthermore, the primary economic impact is the contamination of farmland and, as a result, weighing by population is not appropriate.

Response: The FEIS values for economic costs used in the GEIS exhibit a reasonably strong correlation with the EI. One reason for this is the fact that the FEIS costs, calculated using the CRAC calculation, tend to be dominated by decontamination, evacuation, and relocation components. However, current state-of-the art offsite consequence models, such as the MELCOR Accident Consequence Calculation System (MACCS), assume a greater contribution from land interdiction and crop disposal costs. As a result of these new assumptions, the EPA's concerns are reasonable, particularly when the costs associated with sparsely populated areas with high agricultural production are considered. Modification of the EI method for estimating economic costs given in Appendix G of the GEIS to more accurately reflect current state-of the-art calculation techniques is therefore necessary.

In order to provide a method that would incorporate current state-of-the-art calculation techniques, the following modifications to the EI methodology for estimating expected costs has been made. A recent study by Brookhaven National Laboratory using MACCS indicates that correction factors should be applied to all expected cost values generated from the EI correlations. The study indicates that the appropriate correction factor is dependent on the number of persons living near a reactor site, and ranges from about a factor of 5 for highly populated areas, to a factor of 10 for moderately populated locations, to a factor of 30 for sparsely populated sites. Since the correction factor applied to areas with low population incorporates the increased contributions of crop disposal and farmland interdiction, the corrected EI correlations provide reasonable estimates of the total expected costs associated with severe reactor accidents. Finally, since the projected economic costs given in Appendix G are based on 1980 dollar values, a column showing expected costs at the middle year of the license renewal period is included.

Concern Nmbr: POA.018
Topic: Postulated Accidents
Subtopic: Bioaccumulation
Associated Comment Nmbr(s): 087.103
Concern: The EPA assumed that the bioaccumulation factor approach was used to calculate the doses referenced on page 5-56, in association with the ingestion of aquatic organisms. If so, the agency questions whether that approach can be reliably used under conditions where the activity in the water and sediment are undergoing rapid change.

Response: In both the GEIS and Fermi analysis (see Section 5.3.3.3), a linear relationship is established between edible aquatic food harvest and population dose. Because a bioaccumulation factor was incorporated into the Fermi analysis, the GEIS data implicitly incorporate bioaccumulation. The GEIS text has been revised to describe the treatment of bioaccumulation.

The modeling methodology accounts for changes in radioactive nuclide concentrations in both sediment and surface water. The sediment model accounts for both the removal of radionuclides through sedimentation, as well as leaching back of the radionuclides from the sediment into the

water column. Surface water transport models are used to determine dispersing waterborne concentration functions, resulting in time-dependent water concentrations. The bioaccumulation approach is considered to be appropriate when the organisms have been in a reasonably constant concentration field for a period of sufficient duration for trophic and biological exchange processes to approach equilibrium. Since the timeframe of interest for aquatic food concentrations extends up through one year, utilization of the various time-dependent waterborne radionuclide concentrations, when divided into periods of reasonably constant concentration, will provide reliable determinations of aquatic food concentrations of radioactive nuclides. For a detailed discussion of the use of the bioaccumulation factor, see Appendix C of NUREG-0440, *Liquid Pathway Generic Study*.

Concern Nmbr: POA.019
Topic: Postulated Accidents
Subtopic: Water runoff
Associated Comment Nmbr(s): 087.101
Concern: The EPA pointed out that page 5-44, line 24, states that runoff is not addressed in the analysis of impacts. The GEIS should demonstrate that runoff is not a significant contributor to risk as compared to direct deposition on the water.

Response: The NRC recognizes that runoff could contribute to dose. However, the CRAC calculation assumes that all deposition on land remains on land and is available for ingestion and inhalation. Therefore, this amount of contamination is not available to runoff and would be double-counted if calculated in the runoff as well.

One study mentioned by the EPA on the contribution of runoff to surface water contamination (*Contamination of Surface-Water Bodies After Reactor Accidents by the Erosion of Atmospherically Deposited Radionuclide*, by Helton, Muller and Bayer) was the basis for not including the impact of runoff in the GEIS analysis. This study concludes that the contamination of surface-water bodies after reactor accidents by the erosion of atmospherically deposited radionuclides is not a major contributor to risk. The study looked at water bodies equivalent to those classified in the GEIS as a small river, large river, and great lake. A source term equivalent to that assumed in Chapter 5 of the GEIS was used: radionuclide deposition was assumed to be entirely in the lake or river watershed, and no credit was given for any mitigative measures being taken. The study indicates that the contribution to latent fatalities from runoff to a great lake is less than 15 percent of what would be expected by direct deposition onto the lake. For both the river and the great lake, the expected latent fatalities are only a small fraction (two to four orders of magnitude) of the latent fatalities predicted from land contamination. This can be seen by comparing the results in Helton, et al. (adjusted to account for the frequency of the source term used—10^{-5}/yr) with the results in Table 5.10 of the draft GEIS for atmospheric releases. A change has been made in the GEIS to clarify this point.

Concern Nmbr: POA.020
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.074
Concern: The MDPS pointed out that although a number of power plants, including Monticello and Prairie Island, are not bound by the study on aquatic food pathway risk, the GEIS concludes that the issue is low for all sites. Since analysis is not provided to show that interdiction of the fallout resulting from a nuclear accident is feasible and effective, this conclusion is unfounded.

Response: Although the flow rates, residence times, and surface-to-volume ratios for several small river sites are such that these sites may not be bound by the Fermi 2 surface water analysis, the analysis in Section 5.3.3.3.2 of the draft GEIS demonstrates that the aquatic food pathway would be expected to contribute a small fraction of the dose of the atmospheric pathway at these sites. It is the small, relative contribution to the uninterdicted dose from the aquatic food pathway that is the basis for the conclusions in the GEIS, not the effectiveness of interdiction. Interdiction would just further reduce the population dose.

Concern Nmbr: POA.021
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 064.007
Concern: The UCS disagrees with use of existing plant-specific PRAs to support a generic conclusion that the risk of accidents will not increase during the renewal period. These PRAs are not valid because they do not account for the effects of aging and they neglect the failure of passive components.

Response: The NRC thoroughly addressed the issue of aging of plant systems in 10 CFR Part 54. Continued safe operation of a commercial nuclear power plant requires that structures and components that perfom or support safety functions continue to perfom in accordance with the applicable requirements in the licensing basis of the plant. The final rule requires each renewal applicant to address the effects of aging through an IPA that demonstrates that the facility's structures and components requiring aging management review for license renewal have been identified, and that the effects of aging on their functions will be managed to maintain the current licensing basis during the period of extended operation. Although PRA techniques may be used as a supplemental tool in the renewal applicant's IPA, the methodology for conducting an IPA needs to emphasize deterministic approaches. Additionally, the NRC has in place programs to control and manage aging effects, as required by the maintenance rule, 10 CFR 50.65. Utilities are required to monitor the perfomance or condition of structures and systems against established goals to provide reasonable assurance that they are capable of perfoming their intended functions. The combined impact of these programs will provide high confidence that significant increases in risk to the public will not arise as a result of aging effects.

Concern Nmbr: POA.022
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 081A.005
Concern: The NIRS is concerned that the GEIS conclusions on postulated accidents are understated. They implied that the environmental impacts of postulated accidents by extended license would not be a small cost; instead, there is a greater chance of failure of steam-generator pipes and tubes, and reactor vessels with additional aging. Additionally, a top NRC official admitted in 1986 that the containment vessels on 24 GE reactors have a 90 percent chance of failure in a nuclear accident. They also ascertained that the complete implementation of the TMI Action Plan has not occurred in many plants and the NRC is only capable of inspecting 1 percent of each reactor.

Response: Both the licensee and NRC staff evaluate design-basis accidents to ensure that the plant meets acceptable design and performance criteria. The environmental impacts of design-basis accidents are evaluated during the initial license process, and the licensee is required to maintain acceptable design and performance criteria throughout the life of the plant, including any extended-life operation. Additionally, the NRC has in place several programs and processes directed towards reducing the likelihood and consequences of severe accidents. The CPI program examined five different reactor containment types, addressing potential failure modes, potential fixes, and the cost-benefit of these fixes (which resulted in improvements being made where cost-effective). Each nuclear reactor plant licensee has been requested to perform an IPE and IPEEE to look at the vulnerabilities to both internal and external initiating events respectively. The IPEs and IPEEEs will be used by the NRC to identify modifications to the plant, where warranted, via the NRC's backfit rule. The NRC has maintained a severe accident research program to investigate areas in which a lack of information or a large uncertainty has precluded a definitive conclusion on the significance or resolution of a safety issue. Collectively, these programs provide a depth and breadth for examining the likelihood and consequences of both design-basis and severe accidents.

To supplement the control that the normal regulatory process has over the aging effects on the physical plant, the NRC will require that the renewal applicant specifically address the issue of age-related effects by identifying, in an IPA, those structures and components which are susceptible to aging and whose functions are necessary to ensure that the facility's licensing basis is maintained. This will include consideration of steam generator and reactor vessel components. The licensee will further be required to establish and maintain an aging effects management program for these structures and components.

In response to the TMI accident, NRC staff developed the Action Plan, NUREG-0660 (NRC, 1980), to provide a comprehensive and integrated plan to improve the safety of nuclear power plants. NUREG-0737, *Clarification of TMI Action Plan Requirements* (NRC, November 1980), mandated the implementation of these specific issues, and provided clarification of technical positions and additional information on schedules, method of implementation review, and submittal dates. Each of the TMI Action Plan items were addressed in accordance with the GSI process described in NUREG-0933, *A Prioritization of Generic Safety Issues* (NRC, 1987). As described in SECY-89-138, the NRC maintains an active program for evaluating and resolving GSIs that may impact public health and safety. A GSI involves a safety concern that may affect

the design, construction, or operation of all, several, or a class of reactors or facilities. Its resolution may have a potential for safety improvements and promulgation of new revised requirements or guidance.

Concern Nmbr: POA.023
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 054.079
Concern: The State of Minnesota noted that the GEIS does not address possible changes in time for radioactive materials to escape from aging plant systems if a severe accident would occur. This should be addressed in Chapter 5.

Response: The analyses performed by the NRC in the assessment of consequences from potential accidents are very conservative in their assumptions. Regulatory Guide 1.3, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors," and Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors," each make the assumption that the inventory of radionuclides available for leakage to the environment is available immediately after the accident. As such, any potential change in the actual time for materials to escape which might somehow occur as a result of aging plant systems would nevertheless result in a less restrictive assumption than that utilized in Chapter 5 of the draft GEIS. Consequently, it is not deemed necessary to address material escape times in Chapter 5.

Concern Nmbr: POA.024
Topic: Postulated Accidents
Subtopic: Severe accidents
Associated Comment Nmbr(s): 011.001 038.028 096.003
Concern: The MDNR noted that U.S. reactors were not designed to handle "severe" accidents, that is, those involving multiple failures of safety systems, but that there exist numerous studies demonstrating that these plants have a large margin of safety even for those low probability events. The agency suggests that the results of IPEs, mandated for each U.S. plant by Generic Letter 88-20, could provide greater details regarding the margin of safety in terms of probabilistic assessment. The New Jersey Department of Environmental Protection and Energy stated that the IPE results should be integrated into the site-specific EIS. The State of New Jersey commented that the NRC should consider using the IPE results from those plants that have completed a level 2 PRA to determine the offsite consequences associated with the postulated accident scenarios at the plants. These consequences could then be compared with the consequences calculated by NRC staff using the EI methodology, with a subsequent revision to the GEIS if warranted.

Response: The NRC agrees that, although plants were not designed for severe accidents, the conservative methods used to design for single failures have been shown to provide a significant margin to accommodate multiple failures. Such a margin has been accounted for in the analyses presented in Chapter 5, where WASH-1400 analyses were used as the bases. It is entirely possible that, when the NRC has finished its review of all the IPEs and changes have been made to plant systems or procedures, an even greater margin than presently accounted for may be

documented. The IPE results could also be used with a level 2 PRA for applicable plants to determine the offsite consequences of postulated accidents, which could be compared to those calculated by the NRC using the EI methodology. However, the NRC believes that, for the purposes of discharging its responsibility under NEPA, the evaluations presented in Chapter 5 of the draft GEIS adequately portray the risks to the public from severe accidents. It is also important to note that the NRC does not intend to prescribe, by rule, the scope of an acceptable consideration of severe accident mitigation alternatives for license renewal nor does it intend to mandate consideration of alternatives identical to those evaluated previously. In general, the NRC expects that significant efficiency could be gained by using site-specific IPE and IPEEE results in the consideration of alternatives. The IPEs and IPEEEs use level 1 (identification of probabilities of core damage) and level 2 (identification of probabilities of fission product releases) PRAs. Although level 3 PRAs (identification of probabilities of latent and acute fatalities due to off-site releases of fission products) have been used in SAMDA analyses to generate site-specific off-site dose estimates in order to determine the costs and benefits of mitigation alternatives, the NRC does not believe that such PRA is necessary for the consideration of mitigation alternatives for license renewal. Licensees can use other quantitative approaches for assigning site-specific risk significance to IPE or IPEEE results and judging whether an alternative provides sufficient reduction in the frequency of core damage or fission product release. For example, the licensee could use information provided in the GEIS analysis of accidents (exposure indices, wind frequencies, and demographics) to translate the dominant contributors to core damage frequency and large release frequencies from the IPE/IPEEE results into dose estimates so that a cost-benefit determination can be made. On the other hand, in some instances, a consideration of the frequency of core damage or fission product release (i.e., no conversion to dose estimate) may be sufficient to conclude that no significant reduction in off-site risk would be provided, and therefore mitigation is not warranted. In any event, the NRC will review each severe accident mitigation consideration provided by the license renewal applicant on its merits and determine whether it constitutes a reasonable consideration of severe accident mitigation alternatives. See also the response to POA.004.

Concern Nmbr: POA.025
Topic: Postulated Accidents
Subtopic: Fission products
Associated Comment Nmbr(s): 038.029 038.031 038.032
Concern: The MDNR pointed out that some of the gaseous fission products, namely xenon and krypton, are located in the fuel matrix and in the region between the fuel pellet and the cladding inner wall, known as the gap region. The agency pointed out that in some accident events it is possible to rupture the cladding, thereby releasing the noble gases in the gap, while the fuel matrix has not been significantly challenged. In reference to fission product removal mechanisms including settling, plate-out and scrubbing, the MDNR pointed out that these are accident and sequence specific. Additionally, they can be reversed in certain accident sequences and thus, delay but do not prevent the release of fission products. Therefore, the MDNR suggested that this be noted on page 5-3, lines 11–20, of the GEIS.

The MDNR also noted that radioactive decay is an important consideration in accident analysis, primarily from the perspective of heat removal. It noted that decay represents a removal

mechanism of only secondary importance, and that from a severe accident perspective, it is only applicable to those fission products with a half-life shorter than one or two days.

Response: The NRC agrees that a fraction of the xenon and krypton—and a similar fraction of the more volatile, non-gaseous fission products iodine and cesium—would be located in the gap region. The fraction of gaseous and volatile fission products that could be expected to be in the gap region is a function of the past and present power history of the rod; it could range from a few percent to 10–15 percent. The GEIS simply states that design of safety systems takes into account the locations and properties of the radioactive materials. The NRC further agrees that some accidents could be terminated in a condition where the clad would have been ruptured in some fuel rods, releasing their gap inventory, without damage to the fuel matrix. The analysis done for the GEIS includes the release of 100 percent of the noble gases under conditions of core melt. Less severe accidents will release less, and if just the cladding fails (no fuel melt), only the gases in the gap will be released. However, the consequences of this type of release are much smaller than if a core meltdown occurs. Additionally, the NRC agrees that fission products that condense or plate-out on cooler surfaces can, under some accident conditions, re-vaporize and once again be available for transport. However, the tendency to be absorbed by moisture is still an applicable mitigating characteristic.

The decay issue was mentioned in the referenced location not as a removal process (which it may be under certain circumstances) or because of its importance to the amount of heat which must be removed to prevent core damage, but because it is the radiation released during decay that makes the material hazardous. In that context, the fact that some materials have long half-lives is of importance to the calculation of offsite consequences.

Concern Nmbr: POA.026
Topic: Postulated Accidents
Subtopic: Editorial
Associated Comment Nmbr(s): 038.030 038.034 038.037
Concern: The MDNR suggested editorial changes to particular pages or tables with supporting rationale. Firstly, it pointed out that page 5-3, line 1, should be changed to read: "The reactor containment structure and containment support systems are designed to minimize the possibility of this type of release." Secondly, it disagreed with the GEIS use of the words "passive" and "leaktight" in relation to containment structures. Therefore, it would like the word "passive" to be removed from page 5-9, lines 15–18, because, though the next generation of reactors attempts to incorporate a passive design, the current LWR containments do not employ these techniques. In relation to "leaktight", the MDNR stated that containments leak, and nuclear power plants establish limitations on the amount of leakage considered acceptable over a 24-hour period. Thirdly, the MDNR pointed out that the footnote marker "a" in Table 5.35 should be moved from 3a to 3c, noting that the hard pipe vent for Mark I handles decay power and not anticipated transit without scram. Finally, the MDNR noted a typographical error in Section 5.4.3.

Response: The NRC agrees with these comments; the noted changes have been made.

Concern Nmbr: POA.027
Topic: Postulated Accidents
Subtopic: Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 038.033
Concern: The MDNR disagreed with the GEIS conclusion that significant environmental impacts caused by accidents at LWR plants are not at all likely to occur over time periods of a few decades (p. 5-7, lines 8–12). The MDNR pointed out that the timeframe may actually be longer or shorter than stated and, therefore, has little meaning and should be removed. It suggests that the authors consider making this point with respect to IPE results of the estimated core damage frequency per plant.

Response: The statement is based on hundreds of reactor-years of U.S. LWR operating experience without a significant release to the environment due to an accident. Such experience represents a statistically relevant database over the period of a few decades and should not be discounted in the evaluation of future risks. The IPE results are not available yet for all plants. Examples of comparisons from the NUREG-1150 plants and the La Salle PRA (NUREG/CR-5305) are provided in the response to POA.004. However, these values represent calculations and the referenced paragraph refers to the experience base. No changes have been made to the GEIS.

Concern Nmbr: POA.028
Topic: Postulated Accidents
Subtopic: Severe accidents
Associated Comment Nmbr(s): 038.036 063.009
Concern: The MDNR commented on the GEIS statement that the uncertainty in source terms represents a significant uncertainty in the absolute value of the risk. The MDNR cited NUREG-1228, which, in turn, cited NUREG-0956, where the source term uncertainty was quantified as ranging from 100 to 1,000. The MDNR combined the upper bound value of the uncertainty with the highest predicted person-rem (for Indian Point) and concluded that it was still within the range attributable to other sources, and was therefore small in overall consequences. The MDNR concluded further that a Category 1 assignment was justified. The MDNR noted that the source term uncertainty should not be affected by changes in plant environment, but that, in order to fully characterize the nature and magnitude of impacts, more recent, state-of-the-art analytical techniques (e.g., NUREG-1150) might be used for perfoming the analysis.

NUMARC agrees with the NRC's conclusion that the environmental impacts of severe accidents can be characterized as a Category 1 issue. However, in order to satisfy NEPA requirements, they believe that the NRC should specifically provide the bases that it relied upon to support its determination. They note that the validity of the generic finding depends upon the adequacy of the severe accident data used in the GEIS analysis. The GEIS data is derived both from WASH-1400 and the application of the WASH-1400 data in the FEIS evaluations of the 27 plants listed in Table 5.1. NUMARC states that there is no clear explanation for why the NRC concluded that the source term data is adequate to support the generic finding. Further, the NRC should also explain why the 27 FEIS analyses are sufficient to support the determination. NUMARC also indicated that, while the use of the worst case source terms would clearly support a generic conclusion, this approach would go well beyond what NEPA requires, and a more

appropriate evaluation would use average or representative values to cover all sites. NUMARC states that the NRC appears to be relying on safety improvements and enhancements as the alternative to the bounding approach. It notes that the GEIS discussion of these improvements is brief and does not describe the extent to which WASH-1400 technology overstates the source term, given the current licensing basis for operating reactors.

Response: The NRC believes that a full characterization of the nature and magnitude of environmental impacts stemming from severe accidents does not require the full implementation of state-of-the-art techniques for source term estimation. However, in Section 5.3.3.2.4, a comparison was made between the GEIS projections and the NUREG-1150 results. This comparison indicated that the GEIS estimates may be on the conservative side with respect to actual risk.

Section 5.3.4.2 discusses the uncertainty in source term estimation and the comparison of source terms calculated for WASH-1400 with recent methods. It was stated in that section that WASH-1400 source terms were higher in some instances and lower in others compared to more recent evaluations, but for the risk-significant sequences tended to be at the higher end of the uncertainty range.

The NRC recognizes that NEPA does not require bounding analyses. For severe accidents, the NRC does not characterize its analyses as bounding for the reasons discussed in Section 5.3.3.2.1. The NRC is not relying totally on the 27 FEIS analyses, but has extended them (through the use of the EI) to represent not only all operating plants, but also the mid-year of license renewal. Therefore, not even the 27 plants in Table 5.1 have risk estimates in Tables 5.9, 5.10, and 5.12 that are equal to the corresponding values in the FEISs.

Concern Nmbr: POA.029
Topic: Postulated Accidents
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W09.002
Concern: A YAEC representative indicated that the message that the severe accident analysis is a bounding analysis needs to be brought out more in Chapter 5 and in the summary, so that a reader will understand that it does not represent a realistic assessment of plant risks.

Response: As discussed in Section 5.3.3.2.1 under the heading "Selection of Appropriate Existing Analyses for Use in Regression," the NRC wished to have confidence that it did not underestimate potential future environmental impacts from severe accidents. Therefore, in order to "cover" factors not specifically accounted for (as discussed under the heading "Enveloping of All Plants with FEIS Analyses") as well as those accounted for in simplified fashion, the NRC chose to use the RSS analyses and the upper confidence bound of the regression. The NRC believes that the RSS analyses should be more representative of the upper end of the total risk spectrum. However, because of the uncertainties and factors not accounted for, the analysis cannot be characterized as bounding. On the other hand, because of the bias toward upper values, the analysis cannot be characterized as best estimate. The NRC only characterizes it as reasonable, in the context of satisfying the NEPA requirements.

However, based on the comments received, the NRC has reconsidered its previous conclusion in the draft GEIS concerning the site-specific mitigation of severe accidents. The NRC has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives has been included in an FEIS or related supplement. Thus, the severe accidents issue is now a Category 2 and will require the consideration of alternatives to mitigate severe accidents, provided such consideration has not already been completed. The NRC's reconsideration of severe accident mitigation alternatives for license renewal is based on its NEPA regulations requiring a consideration of mitigation alternatives in the EISs and SEISs, as well as on a previous court decision that required a review of severe accident mitigation alternatives (then referred to as SAMDAs) at the operating license stage (*Limerick Ecology Action v. NRC*, 869 F.2d 719 [3rd Cir. 1989]). Moreover, the following programs related to severe accidents have not been completed for all plants: (1) containment improvements for all plants pursuant to the CPI program, identifying potential containment improvements for site-specific consideration by licensees; and (2) regulatory program whereby licensees identify individual plant vulnerabilities to severe accidents and consider cost-beneficial improvements. Hence, a conclusion that severe accident mitigation alternatives have been considered generically for license renewal is premature.

Concern Nmbr: POA.030
Topic: Postulated Accidents
Subtopic: Categorization of issues
Associated Comment Nmbr(s): W10.029
Concern: A representative from Don't Waste U.S. commented that attention should be given to the fact that some reactors have an impact upon large aquatic systems. In this regard, he was not impressed to see that Prairie Island was listed (in Table 5.19) as being on a small river—namely the Mississippi.

Response: The Mississippi River at the location of the Prairie Island Nuclear Plant (28 miles southeast of Minneapolis, MN) qualifies as a "small river" within the LPGS definition. A "small river" in the LPGS is one with an annual average flow of less than 105 ft^3/second (2,380 m^3/second); the Mississippi's annual average flow at Prairie Island is only 425 m^3/second.

The NRC believes that, in the context of its NEPA responsibilities, the GEIS has adequately and reasonably described the potential impacts of severe accidents on large and small freshwater and marine environments, based on the LPGS and existing FEIS analyses.

Concern Nmbr: POA.031
Topic: Postulated Accidents
Subtopic: Airplane crash
Associated Comment Nmbr(s): 010.010
Concern: A public interest group (NU-END) commented that aircraft emergencies, arising from two nearby airfields, may impact the Maine Yankee site.

Response: The likelihood and consequences of a plane crash into any safety-related structure are evaluated at the time of original licensing as part of the Safety Analysis Report, based on the

location of nearby airports and the types of aircraft at those airports. As part of the IPEEE, nearby facilities, including airports, will be screened to assure that the impact on the plant from those facilities is either identified and dealt with or shown to be insignificant. The screening process is discussed fully in NUREG-1407, *Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities.*

Concern Nmbr: POA.032
Topic: Postulated Accidents
Subtopic: Substantiation of conclusions
Associated Comment Nmbr(s): 001.005
Concern: A private citizen commented that the NRC's implication that Chernobyl could not happen here is unrealistic. She noted that it would be more accurate to describe severe accidents as "low probability, high consequence (LPHC) risk," which is very different from the NRC's characterization of them as low risk, small cost.

Response: The discussion of the Chernobyl accident in the GEIS occurs in Section 5.2.2, "Accident Experience and Observed Impacts." That section correctly notes the differences in design between U.S. light-water nuclear power plants and the Chernobyl plant that make the accident of only indirect relevance to U.S. plants. Insights from the accident have been applied to U.S. plants, however, especially in the area of the importance of human actions.

Some severe accidents can have high offsite consequences, as at Chernobyl, but other severe accidents can have small or negligible consequences. For instance, the accident at TMI-2, discussed in Section 5.2.2, was characterized by the NRC as a severe accident because of the multiple failures of plant systems (which in this case resulted in massive damage to the core), but the offsite consequences of that accident were negligible. Therefore, not all severe accidents can be accurately characterized as LPHC events. Furthermore, risk is the product of the probability and the consequences, and the NRC has evaluated the integrated risk to be low and costs small for the ensemble of postulated severe accidents, as discussed in Chapter 5.

Concern Nmbr: POA.033
Topic: Postulated Accidents
Subtopic: Local infrastructure
Associated Comment Nmbr(s): 054.076 054.077a 059.008
Concern: Two State agencies commented that the GEIS inadequately analyzed issues of population density related to risk of radiation exposure. In support of this comment, the MDPS made two points. First, the GEIS has accounted neither for the growth in population that may occur within the Low Population Zone (LPZ) nor for the transient population in that area and its potential growth. Second, the GEIS does not consider that no Federal regulation requires an evacuation plan for people outside the 10-mile emergency planning zone (EPZ). It notes that Monticello has the largest 50-mile population in the high-frequency wind direction of the 118 U.S. plants. It believes that relicensing of Monticello will require a very site-specific review of the impact of this large population, especially if there are revisions to the Protective Action Guidelines. The Environmental Protection Division of the Office of the Attorney General for Massachusetts noted that the failure to account for changes in population patterns around

individual plants is a significant flaw because population distribution has historically been a critical factor.

Response: The draft GEIS has indeed accounted for growth over the years (decline in a very few cases) of the population within 50 miles of each site, including the population within the LPZ. Table 5.3 contains the population values projected to the mid-year of the license renewal period. These projections were made based on the 1980 census data and projected growth (decline) factors derived from the U.S. Bureau of Economic Analysis. A change has been made in Section 5.3.3.2.1 to clarify this point. In the FEIS for San Onofre-2 and -3, NRC staff evaluated separately the impact of severe accidents on the transient population, consisting, in this case, of visitors to the beaches adjacent to the plant. They found that the average impact was small, compared with that for the normal population. Even though the transient population was not small (in comparison with the normal population very close to the plant) and evacuated more slowly than the normal population, the projected impacts were mitigated by their presence only at certain times of the day and certain seasons of the year. This same mitigative effect should operate for other transient populations. One of the fundamental bases for the 10-mile EPZ is that the requisite planning for a 10-mile EPZ is judged to provide an adequate basis for ad hoc expansion beyond the 10 miles.

C-12. Topic: Regulatory Analysis, Regulatory Guide, and Environmental Standard Review Plan (REG)

Regulatory Analysis, Regulatory Guide and Environmental Standard Review Plan (REG)

Concern Nmbr: REG.001
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: NUREG-1440-Analysis-approach, assumptions, and data
Associated Comment Nmbr(s): 011.010 080.006 087.124
Concern: The EPA, the New Jersey Department of Environmental Protection and Energy, and Consolidated Edison expressed concern about the assumptions used in the Regulatory Analysis (NUREG-1440). The EPA believes that the assumption used on the timing of license renewal applications, i.e., 12 years prior to operating license expiration, is reasonable. The intermediate scenarios, assuming 25 and 50 percent renewal rates, are also reasonable to bound the analysis. However, the sensitivity analysis could explicitly consider the importance of timing, particularly with respect to the partial renewal scenarios, rather than simply relying on the assertion that this is not important (see p. 11). The 25 percent renewal scenario with only the 29 most recently-licensed plants seeking renewal provides the bounding case. Evaluation of this scenario shows that Alternative B is less expensive than Alternative A at discount rates of 0 and 5 percent, but more expensive at a 10 percent discount rate. If coupled with the upper bound estimate of the effort involved in report preparation and review, this low/late participation scenario might not be cost-effective at even low discount rates.

The New Jersey agency believes that many of the assumptions that form the basis for the analyses in NUREG-1440 are unclear. The use of the term "upper bound" as a threshold for a Category 2 determination needs clarification as to whether it means a worst case or best estimate, and as to whether it means a confidence level of 1, 2, or 3 sigma.

Consolidated Edison stated that they reserve the right to comment on the cost impacts of implementation of the NRC's proposed license renewal program. They believe that the analysis of the estimated cost of renewal of power plant operating licenses contained in NUREG-1440 is premature, given that the Part 51 regulations have not been finalized and the Part 54 regulations have not been fully implemented.

Response: The NRC agrees that a scenario can be constructed whereby generic rulemaking at this time would be premature and not cost-effective. The assumptions would involve a small enough number of plants applying for license renewal sufficiently far in the future and a sufficiently high discount rate. In deciding to initiate a rulemaking, the NRC gave little weight to such a scenario because, at the time, two lead plants were preparing license renewal applications and the potential for additional applications by 1995 was thought to be high.

NUREG-1440 has been revised to clarify the assumptions and the definitions used and to estimate costs based on the final rule.

Concern Nmbr: REG.002
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: DG-4002-Editorial comments
Associated Comment Nmbr(s): 032.018 032.019 056.009 087.015 087.037a 087.046 087.069 087.085a 087.088a
Concern: The EPA, DOI, and NSP submitted content and editorial changes for draft Regulatory Guide DG-4002, "Guidance for the Preparation of Supplemental Environmental Reports in Support of an Application to Renew a Nuclear Power Station Operating License." The EPA suggested the following:

1. Add a subpart under the "Information and Analysis Content for Effects of Refurbishment on Surface Water Quality." The additional subpart should suggest including a discussion of what evidence is necessary to show that best management practices (BMPs) are sufficient. It should also discuss alternative measures to implement if monitoring shows that BMPs are insufficient to meet water quality standards and to protect beneficial uses of receiving waters.

2. Two additional subparts should be added to the requirements for "Information and Analysis Content for Effects of Cooling Ponds on Groundwater Quality." The first new subpart should recommend evaluating all historical information that is available from monitoring cooling pond water and the groundwater of the uppermost aquifer underlying the facility. The second new subpart should emphasize ensuring compliance with all applicable Federal, State, and local hazardous waste management requirements.

3. Add the following provision to "Information and Analysis Content for Threatened or Endangered Species": "If, after review by the appropriate FWS or NMFS Office, it is determined that relicensing and its associated activities will affect a threatened or endangered species, a Section 7 consultation with the FWS or NMFS, as appropriate, should follow." The GEIS and Regulatory Guide should also indicate that applicants are to determine if "candidate" species are present.

4. Add a subpart to the section on "Information and Analysis Content for Transportation Impacts of Refurbishment." The new subpart should recommend evaluating air quality impacts, particularly in non-attainment areas. Air quality assessments should include carbon monoxide, particulate matter, ozone, and reactive organic gases.

5. Additional guidance should be provided for determining when the impact of onsite storage and disposal of LLW is other than small and thereby requires a mitigation plan.

The DOI made the following suggestions:

1. DG-4002, Sections 2.1 and 2.4 do not adequately address thermal effects. The DOI believes that each license renewal applicant must include an analysis of thermal effects in compliance with 50 CFR Part 402.

2. Add to page 22, lines 2–4 ". . . and consult with the appropriate regional and field offices of the FWS, and the NMFS . . . ."

Finally, NSP suggested the following editorial changes:

1. In the DG-4002, Chapter 2, discussion of NEPA data and information requirements relating to "Heat Shock, Impingement, and Entrainment Effects on Fish and Shellfish," on page 16 (item 2.1.1), a sentence states that if both 316(a) and 316(b) documents are available, item C may be omitted. This does not agree with NUREG-1429, draft Environmental SRP which eliminates the information required by items B, C, and D if 316(a) and 316(b) are available. The sentence should be changed to read: "If the required documents are available, items B, C, and D may be omitted."

2. On page 27 of DG-4002 in the discussion on the effects of license renewal on housing, the requirements of DG-4002 and NUREG-1429 do not match. If items A and B of the Regulatory Guide are met, only item C is omitted. NUREG-1429 omits items C through G. Also, DG-4002 contains item H, which is not in NUREG-1429.

Response: Responses to the EPA's comments are as follows:

1. The literature review and the inquiries made of Federal and State resource people did not identify any existing or documented problem from the types of construction activities that would be associated with plant refurbishment. In view of this, the NRC does not believe that a discussion of what constitutes BMPs or alternative measures is warranted.

2. The information, which the commenter would have added, appeared to be incorporated already. Paragraph 2.2.1 states that significant consideration should be given to actual experience and that data based on operational experience is considered more reliable than data based on predictions. Item 2.2.1.D. specifies information on cooling pond water quality. Item 2.2.1.E. specifies quality of local aquifers that could be impacted. Item 2.2.1.F has been revised to note explicitly that hazardous waste management requirements are included among groundwater quality requirements to be considered.

3. Section 7 consultation is the responsibility of the NRC, not the licensee. However, NRC staff recognizes that the consultation may result in the identification of more detailed information. Licensees are, therefore, requested to consult with the governing agency when the potential exists for impact to a protected species.

4. DG-4002 treats the impacts of transportation on air quality in non-attainment areas in the section on air quality.

5. For the purpose of a license renewal review, the environmental impacts of onsite storage and disposal of LLW are treated in Chapter 6 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants* and require no additional analysis for a plant review. Further, onsite disposal of LLW would be addressed in the plant decommissioning review.

The responses to the DOI's suggestions are as follows:

1. 50 CFR Part 402 is concerned with the consultation and review process with respect to endangered species. This process will be addressed in the Regulatory Guide.

2. This language will be included in the Regulatory Guide.

The response to both NSP comments is that DG-4002 and NUREG-1429 will be revised to identify the same information requirements.

Concern Nmbr: REG.003
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: NUREG-1440-Cost estimates
Associated Comment Nmbr(s): 087.123 087.125 087.126 087.127 087.128 087.129 087.130
Concern: The EPA made the following points regarding the per plant cost estimates for Alternative B in draft NUREG-1440, *Regulatory Analysis of Proposed Amendments to Regulations Concerning the Environmental Review for Renewal of Nuclear Power Plant Operating Licenses*:

1. The labor rate of $47.90 for the NRC is not valid. The implementation of "Full Cost Recovery", as mandated by Congress, has resulted in a 1991 cost of $115/hour. Moreover, these "NRC costs" will now be billed directly to licensees. NUREG-1440 should reflect this change, both in the labor rate assigned to the NRC and in the headings of the cost elements. Suggested changes would be:

   Industry Costs = Industry Analysis and Submission Costs
   NRC Costs = Costs for the NRC to Review and Approve Documents.

2. The per plant cost estimates for Alternative B do not reflect the discussion in the text. In Section 4.3.1, the Average Plant Cost (undiscounted) is given as $134,000. However, based on the data provided, the cost is $111,700 per plant. For NRC Costs the calculation is analogous, except that the hours/issue and dollars/hour are 3,000/97 = 31 and $115, respectively. Thus, the NRC cost per plant is $78,400.

3. Table 1, NRC Costs and Total Costs should be corrected to reflect the NRC labor rate of $115/hour. Additionally, Table 2 costs should be corrected to reflect the accurate costing of NRC labor hours at $115/hour, and the correct per plant costs developed above for Alternative B.

4. Table 3 and all subsequent tables must be revised to reflect the corrections to the NRC labor rate and/or the costs of per plant submissions.

5. Including the appropriate development costs and properly computing the industry and NRC costs, the data for the summary table should be corrected. (See page 3 of EPA Enclosure 4 for detailed figures).

6. The costs of Alternative B do not appear to include the costs of "periodic review" of GEIS findings, which NRC has stated an intention of conducting.

Response: The purpose of a regulatory analysis is to provide information on the benefits of rulemaking and optional approaches at the beginning of the rulemaking. However, in the final regulatory analysis of the changes to Part 51, the cost estimates have been revisited so as to reflect the final rule. The rationale for using incremental NRC labor costs rather than the full cost recovery labor rate is explained in NUREG-1440.

Concern Nmbr: REG.004
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: NUREG-1440-Cost/benefits analysis
Associated Comment Nmbr(s): 087.122 087.131
Concern: The EPA believes that the discussion asserting that the benefits under the two alternatives are identical is not fully compelling. The key issue is not really whether the impacts will be identical under the two alternatives. Rather, it is whether or not the certainty that the impacts are within acceptable limits will be identical under both alternatives. NUREG-1440 alludes to this issue in its brief discussion of the costs that interested parties will incur to participate in the process. For groups opposed to the extension of licenses, the generic treatment of a range of impacts may cause them not only to expend considerable resources at the beginning of the process (which might well be more of a burden than committing even greater resources over a longer period of time), but also to feel that the purpose of the GEIS was to exclude them from full participation in the process. Additional consideration and discussion of this issue appears to be warranted.

Regarding Section 4.5.1, "Regulatory Development Costs," the relegation of the regulatory development costs to the sensitivity analysis is inappropriate. The issue is whether it is worthwhile to spend additional dollars now to reduce the future costs of environmental document preparation and review. The characterization of the NRC development costs for Alternative B as "sunk costs" is misleading. Given that the real issue is whether or not it is advantageous to spend X million dollars today to avoid incurring some fraction of Y dollars per year over the next 30 years, it is inappropriate to characterize the X million dollars in development costs as sunk costs and ignore them in the main cost analysis.

Response: The NRC continues to believe that the amendments to 10 CFR Part 51 with respect to license renewal provide for an environmental review process that will result in a level of environmental protection comparable to that which would result from the review process that would have been followed under the existing provisions of the rule. The amendments provide adequate assurance that new information which indicates a significant environmental impact will be considered in the plant-specific review. With respect to the comment on the treatment of development costs as "sunk costs", although these costs could be treated in the "main cost analysis," the NRC believes that (1) the costs have been adequately disclosed and addressed, and (2) it has been demonstrated that Alternative B has a cost advantage over Alternative A.

Concern Nmbr: REG.005
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: NUREG-1440-Regulatory Impact Assessment (RIA)
Associated Comment Nmbr(s): 087.121
Concern: The EPA noted that two overall shortcomings are evident in NUREG-1440. One shortcoming is that no serious effort has been made to address whether or not both alternatives actually provide the same benefits of full and open public participation in the process and, if so, the significance of front loading the costs of participation on intervenors. Indeed, the Executive Order mandating preparation of regulatory impact analyses calls for a "description of potential costs, including any adverse effects that cannot be quantified in monetary terms . . . ." A second weakness is that the analysis of costs misses the key issue, namely, whether the higher development costs of Alternative B are offset by the magnitude of the future savings.

Response: The selection of Alternative B (generic rulemaking) will not limit meaningful and open public participation in the review process. The public has had an opportunity to provide comments at several phases of the rulemaking, and will have full opportunity to provide comments during the plant-specific review in a public meeting and on the draft SEIS. With respect to the higher development cost of Alternative B, savings in total cost over Alternative A are still estimated.

Concern Nmbr: REG.006
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: NUREG-1429
Associated Comment Nmbr(s): 032.019a 032.020 087.007
Concern: The EPA and NSP commented on NUREG-1429, draft Environmental SRP. The EPA pointed out that both the proposed Part 51 rule and the guidance for preparing supplemental environmental reports (DG-4002) required the applicants to describe activities that will be taken to prepare for renewal, and any changes to O&M during renewal. However, no instructions were given to the NRC reviewers in NUREG-1429 to verify that these activities were bounded by the GEIS. The EPA questioned whether these review procedures were in another document; if not, they should be added to NUREG-1429. The EPA also questioned how the environmental review would be handled if the applicant's activities were not within the GEIS bounds.

NSP pointed out inconsistences between NUREG-1429 and DG-4002, which on page 30, requires under item I that the magnitude of potential impact on health from shock-hazard be discussed if item A is not met. NUREG-1429 has no such discussion. It also pointed out another inconsistency between these two documents regarding the allowed omissions of items on page 27 of DG-4002 and on page C-21 of NUREG-1429 (see concern REG.002).

Response: DG-4002 will provide guidance on the information that must be submitted that describes the proposed action, including the applicant's plans to modify the facility or its administrative control procedures as described in accordance with 10 CFR Part 54. The information submitted will include a detailed description of the modifications directly affecting the environment or affecting plant effluents that affect the environment. In addition, applicants will be requested to identify proposed modifications that are not within the bounds addressed in the

GEIS and to assess the environmental impacts of those modifications. NUREG-1429 will provide guidance to NRC reviewers on how to review the applicant's information.

Concern Nmbr: REG.007
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: Threatened & endangered species
Associated Comment Nmbr(s): 056.010
Concern: The DOI disagrees with Section 2.11 of DG-4002, which includes the requirement to report proposed mitigation measures to minimize potential impacts on threatened and endangered species or their habitat. Mitigation is inappropriate for Federal activities affecting listed species or their critical habitat.

Response: DG-4002 will be revised to reflect that either the FWS or the NMFS as a result of a Section 6 consultation will identify reasonable and prudent measures for the NRC and the applicant to pursue in order to minimize the potential for impact on an endangered species or its habitat.

Concern Nmbr: REG.008
Topic: Regulatory Analysis/Regulatory Guide
Subtopic: Threatened & endangered species
Associated Comment Nmbr(s): 056.008
Concern: The DOI disagrees with the GEIS definition of "important" species and suggested that the NRC consider incorporating the definition used in the Mitigation Policy of 1981 into NUREG-1429.

Response: The NRC does not agree that the definition of "important" used in NUREG-1429 would potentially eliminate from review species that may be ecologically important. Nevertheless, the NRC will ensure that the definition of "important" used in the final environmental SRP (NUREG-1429) will not conflict with or appear to conflict with the definition of "important" species used in the FWS's Mitigation Policy.

C-13. Topic: Socioeconomics (SOE)

Socioeconomics (SOE)

Concern Nmbr: SOE.001
Topic: Socioeconomics
Subtopic: Transportation-categorization
Associated Comment Nmbr(s): W05.002 W05.004 W05.005 W05.008 .W05.009 W05.011 W05.012 055.005 063.017 080.004 107.001
Concern: At the workshop, representatives from the nuclear industry (NSP, Cleveland Electric Perry Nuclear, YAEC, GE, and NUMARC) and the Massachusetts Emergency Management Agency recommended that the transportation issue be categorized as Category 2 instead of Category 3. They commented that Tables 3.4 and 3.5 in the GEIS indicate that in the majority of cases the transportation impacts are insignificant, and that construction period data used in the GEIS analysis probably overestimates the impact on transportation. Moreover, the number of workers projected for refurbishment/renewal is lower than original construction, and almost by definition the impacts were acceptable. They believe that refurbishment will not be any harder on transportation systems than past major outages, which did not have a major impact. Therefore a bounding criteria based on past major outages should be considered. They also suggested looking at the refurbishment workforce in light of the workforce additions during past outages.

In their written comments, NUMARC and three electric utility companies (Consolidated Edison, Union Electric, and YAEC) further reiterated their position that the transportation issue should be a Category 2 issue. They recommended using the Transportation Research Board's definitions of level of service (LOS) determinations for specific plants as the enveloping criteria. The conclusion could be bounded if existing roadways had a LOS of A, B, C, or D, whereas a LOS of E or F would require further analysis or mitigative actions, thus, justifying a Category 2 finding. Additionally, they believe that the significance of any mandatory analysis for refurbishment transportation impacts will actually be spread out over a number of refueling outages.

Response: Based on the new definitions of issue categories, transportation is now designated as a Category 2 issue. The significance levels of transportation impacts were derived from LOS, which qualitatively describes the operational conditions within a traffic stream (see response to Concern SOE.012). While impacts to transportation during refurbishment and continued operations are expected to be small at most sites, a few sites are expected to experience moderate or large impacts.

The GEIS acknowledges that much of the refurbishment work required for license renewal will occur during current term outages scheduled over a period of several years. However, the GEIS uses the 9-month refurbishment outage scenario because it provides a reasonable upper bound and a consistent scenario with which to examine the potential for impacts at several case study plants.

Concern Nmbr: SOE.002
Topic: Socioeconomics
Subtopic: Transportation
Associated Comment Nmbr(s): W05.010
Concern: With regard to the transportation issue, an industry representative from YAEC requested clarification as to what socioeconomic impacts are considered significant.

Response: The definitions of significance levels that may be assigned to socioeconomic impacts are provided in the GEIS.

Concern Nmbr: SOE.003
Topic: Socioeconomics
Subtopic: Housing-categorization
Associated Comment Nmbr(s): W05.013
Concern: A GE representative would like NRC to consider making housing a Category 1 issue instead of a Category 2, or loosening the bounding criteria so that it effectively becomes a Category 1 issue. The construction period data used in the NRC analysis probably overestimates the impact on housing. Data can be gathered over the next couple of months and criteria put together that take advantage of the fact that these plants have been operating for a number of years. They have experienced long outages with significant additions to the workforce without major environmental impacts on housing. The findings would probably show that the impacts of refurbishment outages on housing are insignificant. If the data shows otherwise, leave it as Category 2.

Response: The housing issue is designated Category 2 because clearly adverse housing impacts occurred during a periodic plant outage at one of the case study plants. Moderate and large impacts are possible at sites located in rural and remote areas, at sites located in areas that have experienced extremely slow population growth, or at sites with growth control measures that limit housing development.

Concern Nmbr: SOE.004
Topic: Socioeconomics
Subtopic: Local infrastructure
Associated Comment Nmbr(s): W05.003 009.001 059.006 093.006
Concern: At the workshop, a representative from the Iowa Department of Commerce pointed out that the impact of renewal depends on the economic conditions in the surrounding area which may have changed in the past 5 to 10 years and may change in the future. An assumption implicit in the GEIS, that the local infrastructure will be maintained throughout the renewal term, is questionable given the retrenchment of spending by State and local governments throughout the Midwest and the West Coast. Things that were developed in the 1970s and early 1980s may not be maintained at the same level of economic well-being in the year 2000 as they are today. Therefore, in examining renewal impacts, utilities should consider whether the local infrastructure has been maintained and how future economic conditions might affect housing, transportation, and the availability of other public services.

In their written comments, the Iowa State Utilities Board, the Environmental Protection Division of the Office of the Attorney General of Massachusetts, and the NECNP raised the following points:

1. A better policy for NRC may be to assess socioeconomic issues as Category 2, thereby the license applications will contain a contemporaneous analysis of local socioeconomic impacts, which will enable the NRC to make fully infomed decisions about these license renewal applications.

2. The use of a GEIS is incorrect because it cannot take into account the changes that will occur in the environs of nuclear plants over the next 40 years. Site-specific analyses of changing demographic patterns should be developed in addressing such issues as severe accidents, the social and economic effects of relicensing, public health effects, and decommissioning. Socioeconomic conditions warrant site-specific analysis at license expiration, not 20 years earlier at license renewal. Existing economic models cannot accurately predict future socioeconomic conditions without requiring constant updating.

Response: Regarding the concern that socioeconomic conditions could likely change in the future, Sections 3.7.2 and 3.7.4 have been expanded to show why the conclusions presented in the draft GEIS on impacts to housing and public services would not change even in the event of declining economic conditions in host communities.

Regarding the second and third concerns, the NRC believes that the treatment of socioeconomics in the GEIS and the category designations of the various socioeconomic issues provides an adequate basis, relative to socioeconomics, for an informed license renewal decision. The socioeconomic analysis in the GEIS is based on an extensive body of analyses dealing with the socioeconomic impacts of power plants on local communities and the surrounding regions and is based on projected demographic changes at each case study site.

Concern Nmbr: SOE.005
Topic: Socioeconomics
Subtopic: Refurbishment scenario
Associated Comment Nmbr(s): W05.006
Concern: A representative from the Massachusetts Emergency Management Agency addressed the following points with regards to the refurbishment scenario used in the GEIS: (a) the refurbishment activity specified in the GEIS and the associated impacts are overstated unless there are going to be some major reconstruction-type activities, which he doubted; (b) the bounding criteria for transportation and housing impacts should be established based on the workforce experienced during past routine major outages; and (c) it is doubtful that 1,000 additional workers could have a significant impact on transportation and housing.

Response: The NRC generally agrees with the comment. However, a conservative bounding approach was taken in the GEIS to assess the impacts. Also, see the responses to SOE.001 and SOE.003.

Concern Nmbr: SOE.006
Topic: Socioeconomics
Subtopic: Plant shutdown scenario
Associated Comment Nmbr(s): W05.007
Concern: A representative from the State of Massachusetts cited the following specific points with regard to the plant shutdown scenario: (a) the base case for predicting socioeconomic impacts needs to be based on plant shutdown (since this could result in significant local consequences); (b) the efficacy of predicting future impacts for all nuclear power plants based on a generic study conducted at the present time is questionable; (c) the ability to classify socioeconomic issues as Category 1 is overstated.

Response: The socioeconomic impacts of plant shutdown are addressed in the context of alternatives to license renewal in Chapter 8 of the revised GEIS. With regard to the efficacy of predicting socioeconomic impacts, see the responses to SOE.004 and SOE.005. With regard to the classification of socioeconomic issues as Category 1, the GEIS has been revised to highlight the factors that support classification of socioeconomic issues as Category 1 or Category 2.

Concern Nmbr: SOE.007
Topic: Socioeconomics
Subtopic: Historic resources impacts and refurbishment/Categorization
Associated Comment Nmbr(s): W05.007 W12.038 W12.039 012.001 013.001 087.072 087.073 114.001
Concern: The EPA, the Advisory Council on Historic Preservation, the Oklahoma Department of Commerce, the Arkansas Historic Preservation Program (AHPP) and a representative of the PSCW believe that the proposed Part 51 rule does not adequately address the historic preservation issue. The EPA believes that the categorization of the historic resource impacts of the license renewal term (Section 4.7.7, pp. 4-98; 10-23) as Category 1 is not satisfactorily substantiated. The EPA and the Advisory Council pointed out that the historic preservation issue is an area of site-specific concern and must be satisfied through the National Historic Preservation Act (NHPA). This is similar to the Endangered Species Act (ESA), which cannot be generically resolved. Oklahoma pointed out that even though refurbishment may only involve modifications to existing structures, the State Historic Preservation Officer (SHPO) must still review the case. If earth-moving activities are required in previously undisturbed areas, a complete environmental review and evaluation will be required. Also, the Wisconsin representative is concerned that there is nothing in the GEIS to protect a site in the event of additional construction during refurbishment, even if the utility had originally identified archaeological resources on their site. The AHPP cited Section 106 of the NHPA, which requires Federal agencies to take into account the effect on historic properties of their actions to permit, assist, or license.

Additionally, the Advisory Council suggested changes to two GEIS definitions: historic resource preservation and levels of impacts for historic resources. The accepted definition for historic resources is found in 36 CFR 800.2, which states that "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register [of Historic Places]." To assess the levels of impacts to historic resources, 36 CFR 800.5 and 800.9 should be used. This rule states that the effects occur when "the undertaking may alter characteristics [location, setting, or use] of the property that may qualify the property for inclusion

to the National Register . . . ." The assessment is arrived at through consultation with the appropriate SHPO and is not dependent on public perceptions or complaints about the changed nature of historic resources.

Finally, the EPA pointed out that since there was very little description of the affected environments and of the impacts, the conclusion that the impact [of transmission lines on historic resources] is Category 1 is not satisfactorily substantiated. Also, there should be a clarification that the conclusion applies only to existing transmission lines (Section 4.5.8, pp. 4-71; 10-22).

Response: The GEIS has been revised to use the same definition of "historic property" as found in 36 CFR 800.2(e) and to more fully acknowledge the consultation and analysis requirements of the Advisory Council on Historic Preservation. Historic and archaeological impacts have been changed from Category 1 to Category 2 to reflect the fact that a broad range of impacts (from small to large) are possible.

Concern Nmbr: SOE.008
Topic: Socioeconomics
Subtopic: Taxes
Associated Comment Nmbr(s): 075.013
Concern: The PSCW noted that the tax discussion does not apply to Wisconsin. Tax payments to the State are based on utility revenue. Shared tax payments to the municipality and county are based on a portion of the book value of the power plant, unless limited by population size (p. 3-12, lines 2–7 and 28–32).

Response: Although utility tax payments in Wisconsin are not made directly to municipalities and counties, the draft GEIS discussion of impacts on local taxes is still applicable. For both the refurbishment and license renewal periods, the GEIS examines "the magnitude of potential new tax payments by the nuclear power plants in relation to total revenues in the host community." These "potential new tax payments" could be made directly to municipalities and counties, or indirectly to municipalities and counties through State taxes and revenue sharing programs. In either case, the additional revenue gained by a municipality or county can be examined "in relation to total revenues in the host community." The confusion in this instance is caused by the draft GEIS's reference to "direct payments to local jurisdictions" only. The GEIS text has been revised to include the potential impacts of tax payments to local municipalities and counties through State tax sharing programs. Furthermore, taxes are no longer considered an issue for license renewal.

Concern Nmbr: SOE.009
Topic: Socioeconomics
Subtopic: Land use
Associated Comment Nmbr(s): 075.014 075.015 075.016
Concern: The PSCW noted that while several land uses are not restricted by the right-of-way (ROW), other problems may occur. ROW that crosses non-agricultural land is often an invitation to trespass by hunters, etc. (p. 4-53, lines 30–33). Wisconsin doubts that many farmers would agree that compensation for ROW easements, paid in 1970, is adequate compensation for

economic losses caused by farming around the base of H-frames for power lines (p. 4-53, lines 26–28 and 34). H-frames not only increase the time to perform plowing, planting, insect and weed control, etc., they also cause equipment damage when equipment bumps the structure. This can be significant for crops where timely action is needed to avoid yield or quality reductions.

Response: A statement has been added to the text that power-line corridors on private property may sometimes increase the frequency of trespassing violations on that property (see Section 4.5.3.1 of revised GEIS). The text did not intend to maintain that the compensation was adequate. The text has been revised to state that there was compensation to some extent. Assessment of the adequacy of the compensation is not within the scope of the GEIS.

Moreover, while the NRC recognizes that damage to farm equipment can be caused by accidental bumping against power-line structures, sufficient information to support a need for analysis of this topic in the GEIS is lacking.

Concern Nmbr: SOE.010
Topic: Socioeconomics
Subtopic: Aesthetic impacts
Associated Comment Nmbr(s): 087.070 087.074 087.075
Concern: The EPA stated that since these impacts are unquantifiable and site-specific, the closer review that would be afforded in an impact assessment for each plant's license renewal may be the best available mechanism for ensuring that significant aesthetic impacts are not overlooked. Aesthetic impacts should perhaps be designated Category 2, subject to consideration in each plant's license renewal, for plants that will undertake refurbishment activities beyond certain pre-determined bounds.

Response: The NRC disagrees that aesthetics should be designated Category 2. Most of the activities and changes to plants anticipated in the bounding license renewal scenario will not be visually noticeable from offsite locations. Those activities and changes that may be seen will not differ from the existing character and use of the site and will not be visually intrusive. An applicant for license renewal must submit a description of the proposed action, including plans to modify the facility. If such modifications go beyond the bounds reviewed in the GEIS, the NRC will review those modifications for potential environmental impacts, including aesthetics.

Concern Nmbr: SOE.011
Topic: Socioeconomics
Subtopic: Tax-driven changes
Associated Comment Nmbr(s): 087.071
Concern: The EPA noted the GEIS conclusion that tax-driven changes cannot be categorized as having a positive or negative impact, and therefore are Category 1 issues. However, the prospect that relicensing could result in what some people would consider to be a significant negative impact would seem to suggest that this impact be subject to review in certain license renewal

proceedings. Bounds could be set such that this impact would need to be reviewed only for certain plants.

Response: Tax-driven land use changes are projected to be small to moderate during refurbishment, and small to large during the license renewal term. These changes would probably be considered positive by some community members and adverse by others. Accordingly, offsite land use during refurbishment and license renewal operations are Category 2 issues, and the impacts must be assessed on a site-specific basis as part of the license renewal review.

Concern Nmbr: SOE.012
Topic: Socioeconomics
Subtopic: Transportation
Associated Comment Nmbr(s): 010.004
Concern: A public interest group (NU-END) noted that increases in housing and commercial development in the Maine Yankee area have resulted in critical traffic congestion during the summer tourist months.

Response: In response to other comments, transportation has been changed to a Category 2 issue, using LOS when non-plant-related traffic is heaviest on key road segments at each site to make a determination on the significance level of the impact. Such an analysis will determine if transportation impacts would be significant at Maine Yankee or any other site.

C-14. Topic: Solid Waste Management (SWM)

Solid Waste Management (SWM)

Concern Nmbr: SWM.001
Topic: Solid Waste Management
Subtopic: LLW storage/disposal
Associated Comment Nmbr(s): W10.007 W10.009 W10.012 W10.024 038.013 043.003 059.003 075.017 079.003 081A.007 085.003 096.007
Concern: The Illinois, Maryland, Minnesota, New Jersey, New York, Wisconsin, and Vermont State agencies; several public interest groups (Don't Waste U.S., Don't Waste California, and the FCSE); and a private citizen expressed the need for site-specific discussion of the issues of LLW storage and disposal. They cited the following reasons: (1) relicensing puts an increased burden on the public as the time approaches for the public to take title of all LLW in unsited compacts and unaffiliated States, in accordance with the law (see data given in Figure 1, NUREG-1140, and in Table 6.5, GEIS); (2) the availability of storage facilities and disposal sites to accommodate waste resulting from renewal is questionable, even though such facilities and sites may be available at relicensing (e.g., there may be no licensed LLW disposal site available to accept waste generated during the license renewal period); (3) there is a need to perform a site-specific comparison of waste generated from nuclear power plants with that from use of other sources of fuel; (4) refurbishment of a LWR may require construction of temporary onsite waste storage facilities, or decontamination of a large component may require specialized facilities equipped with systems similar to storage facilities (see GEIS conclusion in Section 3.8.1.6); (5) it is not proper for the NRC to judge a NEPA evaluation as acceptable and subsequently place an additional 20-year waste disposal burden on States to which they may not agree; and (6) the State's role and responsibility for dealing with the LLW storage and disposal site issue must be recognized (hence, this issue should not be Category 2). Based on item (5), Vermont recommended the following change to 56 FR 47028: ". . . If no such demonstration can be made, certification must be presented from an appropriate jurisdiction or agency that such access will be available for the period of license renewal. In addition, a presentation of capability . . . ."

Response: The revised analysis in Chapter 6 of the GEIS finds that the environmental impact of onsite LLW storage is expected to be of small significance for all plants. This issue is designated as Category 1 (based on the new definitions of issue categories). The comprehensive regulatory controls that are in place and the low public doses being achieved at nuclear plants ensure that the radiological impacts of LLW storage will remain small during the license renewal term.

To address the problems associated with the availability of LLW disposal facilities in the United States, the NRC has published a number of guidance documents related to interim onsite storage of LLW. These guidance documents include:

- NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Appendix 11.4-A "Design Guidance For Temporary Onsite Storage of Low-Level Radioactive Waste."

- NRC Information Notice 90-09, "Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees," February 5, 1990.

- NRC Information Notice 89-13, "Alternative Waste Management Procedures in Case of Denial of Access to Low-Level Waste Disposal Sites," February 8, 1989.

- NRC Generic Letter 85-14, "Commercial Storage, At Power Reactor Sites, of Low-Level Radioactive Waste Not Generated by the Utility," August 1, 1985.

- NRC Generic Letter 81-38, "Storage of Low-Level Radioactive Waste at Power Reactor Sites," November 10, 1981.

- SECY-94-198, "Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste," August 1, 1994.

Responses to specific points made by commenters follows.

1. SECY-94-198 provides guidance for evaluating any proposal (by the licensee) to expand on-site storage capacity for LLW generated by normal reactor O&M. An amendment to the Part 50 license is required if (1) a USQ exists; (2) a change in technical specification is required; or (3) an existing license condition needs to be changed to accommodate LLW on-site storage. Thus, public involvement is possible not only during the environmental review of the license renewal application, but also if any of the aforementioned conditions are not met.

(Note: The commenter's calculations did not come from data in a table in either NUREG-1140 or NUREG-1400. Table 6.5 on page 6-14 of the draft GEIS (NUREG-1437) refers to a 10-year renewal-refurbishment period, and a 20-year post-refurbishment period, and calculated BWR and PWR LLW volumes. After a review of the information provided in the concern, it is not possible to reconcile the dates, the PWR waste volumes, or the referenced number of reactors projected to be refurbished referenced.)

2. As noted above, a regulatory framework is in place that would allow utilities to construct and use on-site LLW storage facilities. The ability of a given utility to accommodate waste generated during license renewal would depend on the utility's proposed storage facility design and related safety issues, and on the licensee's ability to meet the existing licensing requirements.

   The discussion of waste management in Chapter 6 of the GEIS attempts to bound expected waste volumes that would be generated if a utility decides to apply for license renewal. The NRC also recognizes the difficulty that States are having in siting LLW facilities, which involves siting, building, and licensing new below-ground disposal facilities away from the reactor, as required by the Low-Level Radioactive Waste Policy Act of 1980 (LLRWPA), as amended. While the NRC recognizes these difficulties it concludes that there is reasonable assurance that sufficient LLW and mixed LLW disposal capacity will be made available when needed for facilities to be decommissioned consistent with the NRC decommissioning requirements.

3. The GEIS assessed the solid radioactive and nonradioactive wastes associated with the relicensing action, as well as the waste impacts of alternative energy sources. The site-specific environmental review will include a comparison of the environmental impacts of

waste generated from the nuclear plant (applying for a renewed license) with waste generated from alternative energy sources.

4. If construction or expansion of onsite LLW storage facilities is required and is not within the limits of the current operating license, the licensee will have to seek an amendment of its Part 50 license pursuant to 10 CFR 50.90.

5. The NRC finds that the environmental impacts of waste management during the license renewal term are of small significance for all plants. However, no predetermination is being made in either the final rule or the GEIS about placing additional burden on the States regarding the amount of LLW to be generated during the license renewal period. Moreover, the NRC does not believe that the change to a statement in the *Federal Register* (56 FR 47208) suggested by Vermont is necessary.

6. The LLRWPA assigned to States the responsibility for providing for the disposal of commercial LLW generated within their borders. The LLRWPA requirements frame the responsibilities of individual States. The GEIS analysis recognizes the role that States will play in the ultimate disposal of LLW. However, it assumes that the States will ultimately fulfill their responsibilities under the LLRWPA, and that there is reasonable assurance that sufficient disposal capacity will be available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.

Concern Nmbr: SWM.002
Topic: Solid Waste Management
Subtopic: LLW storage
Associated Comment Nmbr(s): W10.019 038.050
Concern: The Massachusetts and Maryland State agencies expressed the concern that the bounding criteria for LLW storage do not include the capacity of existing facilities or a commitment from those facilities that they would be available to store wastes generated during the 20-year renewal period.

Response: The GEIS addresses the matter of extended onsite storage of both LLW and mixed waste from refurbishment and operations for a renewal period of up to 20 years. Summary data are provided and radiological and nonradiological environmental impacts are addressed. The analysis considers:

(1) The volumes of LLW and mixed waste that may be generated from license renewal;

(2) Specific requirements under the existing regulatory framework;

(3) The effectiveness of the regulations in maintaining low average doses to members of the public and to workers; and

(4) Nonradiological impacts, including land use, fugitive dust, air quality, erosion, sedimentation, and disturbance of ecosystems.

In addition, under 10 CFR 50.59, licensees are allowed to make changes to their facilities as discussed in the final safety analysis report without NRC permission if the evaluation indicates that a change in the technical specifications is not required or that an unreviewed safety question does not exist. Licensees would have to ensure that any new LLW activities would not represent an unreviewed safety question for routine operations or for conditions that might arise from potential accidents. Both onsite and offsite impacts would have to be considered. If an LLW or mixed waste activity fails either of the two tests in 10 CFR 50.59, a license amendment is required. Subject to the two possible review requirements just noted, the NRC finds that continued onsite storage of both LLW and mixed waste resulting from license renewal will have small environmental impacts and will require no further review within the license renewal proceeding.

Concern Nmbr: SWM.003
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): W10.020
Concern: A North Carolina State representative asked for clarification regarding the figures in Table 6.2 of the GEIS and why they were considered conservative. Specifically, he pointed out that the compact waste numbers are smaller than the total amount of waste shipped, yet compact waste data were stated as conservative. Moreover, he said that North Carolina had one BWR that shipped over 44,000 curies in 1987, which is larger than the 28,000 curies for all BWRs given in Table 6.2.

Response: In the GEIS, the term conservative was used to compare the volume of waste shipped for disposal based on infomation in a DOE/ORNL (Oak Ridge National Laboratory) database, versus data in an Institute for Nuclear Power Operations (INPO) database. The GEIS's use of the term conservative is related to waste volume, not curie content in the waste.

Concern Nmbr: SWM.004
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 087.112
Concern: Referring to the discussion in Section 7.3.2 of the GEIS (Decommissioning), the EPA noted that the waste management issue at decommissioning should be classified as Category 2 because of the potentially increased levels and/or quantities of LLW and the uncertainty associated with developing new LLW disposal facilities. The EPA added that facilities in compact areas that have either not developed LLW disposal facilities or where disposal capacity is uncertain should prepare supplemental environmental documentation.

Response: Chapter 6 of the final GEIS discusses the impacts of offsite disposal of LLW and mixed waste and concludes that impacts will be small. The conclusion that impacts will be small is based on the regulations and regulatory programs in place (e.g., 10 CFR Part 61 for LLW and 40 CFR Parts 261, 264, and 268 for hazardous waste), experience with existing sites, and the expectation that NRC, EPA, and the States will ensure that disposal will occur in compliance with the applicable regulations.

The Low-Level Radioactive Waste Policy Act of 1980 (LLRWPA) made the States responsible for the disposal of commercially generated LLW. At present, 9 compacts have been formed, representing 42 States. The Texas Compact (Texas, Maine, and Vermont) is pending before the U.S. Congress.

New LLW disposal facilities in the host States of California, North Carolina, and Texas are forecast to be operational between 1997 and 1998. Facilities in the host States of Connecticut, Illinois, Massachusetts, Nebraska, New Jersey, Pennsylvania, and New York are scheduled for operation between 1999 and 2002. Envirocare, in Utah, takes limited types of waste from certain generators.

There are uncertainties in the licensing process and in the length of time needed to resolve technical issues, but in the NRC's view there are no unsolvable technical issues that will inevitably preclude successful development of new sites or other off-site disposal capacity for LLW by the time they will be needed. For example, in California, the proposed Ward Valley LLW disposal facility was unexpectedly delayed by the need to resolve technical issues raised by several scientists independent of the project after the license was issued. These issues were recently reviewed and largely resolved by an independent review group. In North Carolina, Texas, and Nebraska, the license application review period has been longer than is required by the LLRWPA, but progress continues to be made.

The State's LLW responsibilities include providing disposal capacity for mixed LLW. Mixed waste disposal facility developers face the same types of challenges as LLW site developers plus difficulties with dual regulation and small volumes. However, in the NRC's view there are no technical reasons why offsite disposal capacity for all types of mixed waste should not become available when needed. The NRC and the EPA have developed guidance on the siting of mixed waste disposal facilities as well as a conceptual design for a mixed waste disposal facility. A disposal facility for certain types of mixed waste is operated by Envirocare in Utah. States have begun discussions with the DOE about accepting commercial mixed waste for treatment and disposal at DOE facilities. Although these discussions have yet to result in DOE accepting commercial mixed waste at DOE facilities, it appears that progress is being made toward DOE's eventual acceptance of some portion of commercial mixed waste at its facilities.

While the NRC understands that there have been delays and that uncertainties exist such as those just discussed, it concludes that there is reasonable assurance that sufficient LLW and mixed LLW disposal capacity will be made available when needed so that facilities can be decommissioned consistent with NRC decommissioning requirements. This conclusion, coupled with the expected small impacts from both storage and disposal justify classification of LLW and mixed waste disposal as Category 1 issues.

Concern Nmbr: SWM.005
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): W10.025 054.068 075.018
Concern: The Michigan, Minnesota, and Wisconsin State agencies suggested that the LLW tabulations be revised to address the following: (1) Michigan is no longer a member of the

Midwest Compact; (2) Ohio has been chosen as the new host State; and (3) the D.C. Cook plant is no longer in the compact.

Response: New information obtained directly from the Midwest compact has been incorporated in the revised GEIS (Chapter 6). The revised status of Michigan, which is no longer a member of the Midwest Compact, or the designated host State for this Compact, is acknowledged in the GEIS. Figure 6.1 of the revised GEIS shows the geographic arrangement of current Compacts and their respective State members.

Concern Nmbr: SWM.006
Topic: Solid Waste Management
Subtopic: LLW disposal-costs
Associated Comment Nmbr(s): W10.028
Concern: A representative from the Massachusetts Emergency Management Agency recommended a more complete development of costs associated with LLW disposal, which is necessary when considering whether it is economical to continue to run or refurbish a plant. The State representative raised the following points: (1) extreme costs could provide the incentive to reduce waste volume; (2) if there are 1 or 2 plants in a State and a plant is shut down, the cost of providing a disposal facility for the remaining waste generators becomes outrageous because of the decentralization of responsibility for LLW disposal; and (3) for smaller operations, today's waste disposal costs may not adequately reflect the resolution of some compact facilities and/or the costs of onsite storage in the absence of compacts.

Response: The concerns are, in general, outside the scope of solid waste management analysis. Such costs are no longer a consideration in the NRC's NEPA determination of whether to renew an operating license.

Concern Nmbr: SWM.007
Topic: Solid Waste Management
Subtopic: LLW disposal-cost/volume
Associated Comment Nmbr(s): W02.009 079.009
Concern: A representative from a Vermont State agency expressed concern, at the Workshop, that the total LLW burden and associated costs, from refurbishment and continued operations, were not reflected in the GEIS. He requested more explanation on the information provided in Table B.6, Appendix B, such as (1) clarify the meaning of the zero for full power operation in the waste volumes column; (2) clarify where the figure for the total additional waste burden is developed; and (3) indicate the assumed cost per cubic foot of LLW disposal and how this is used in the final numbers for cost comparisons. In a subsequent written comment, the State reiterated its concern about the figures given in Table B.6 because they do not envelope the expected LLW volume or costs for Vermont Yankee. The State noted that, at present rates, Vermont Yankee generates approximately 6,000 ft^3 of LLW per year. This would result in 120,000 ft^3 in 20 years of operation with a renewed license. Assuming other volumes in the table are correct, this would result in 154,000 ft^3 of wastes instead of 62,000 ft^3 of wastes. Using a disposal cost of $300 per ft^3, the disposal costs alone would exceed $46 million. Additionally, Vermont Yankee has employed waste volume reduction techniques in the past 5 years to reduce its volume

significantly. Hence, it is not clear that an assumed additional reduction of 10 percent (p. B-29) is valid for Vermont Yankee. This fact is corroborated by GEIS Tables 6.4 and 6.7. (Note: Commenter misread p. B-29; the text indicates a factor of ten reduction, not 10 percent.)

Response: Table B.5 of the revised GEIS provides estimates of the conservative license renewal scenario incremental impact driver or impact initiator quantities associated with new or modified activities performed in support of license renewal. These are new or modified activities relative to current practices for surveillance, online monitoring, inspections, testing, trending and recordkeeping, and any subsequent maintenance, refurbishment, or replacement actions. As such, the information provided in Table B.5 excludes the baseline impact initiator quantities resulting from the extension of current plant operation into the additional operation period allowed by license renewal. Estimates of total impact initiator quantities can be developed by adding the baseline estimates derived from the extension of current operational practices to the estimates provided in Table B.5. For example, the total LLW generated for Vermont Yankee, assuming current trends were to continue and the estimates in Table B.5 are applicable, would be 120,000 ft^3 (baseline) plus the 67,000 ft^3 from the table, for a total of 187,000 ft^3 of LLW associated with license renewal and 20 years of additional operation for this plant.

With regard to Tables B.4 and B.5, the zero in the waste volume column for full power operation indicates that, in the license renewal scenarios used, there were no incremental activities performed during this stage which would add to the LLW generated from a continuation of current practices. The "Total All Occurrences" values shown in the tables are based on the summation of the individual outage estimates, accounting for the number of times each of the outage types occurs. The cost figures presented in the tables excluded consideration of LLW disposal costs. However, analyses performed subsequent to the release of the draft GEIS have developed waste disposal cost estimates. These estimates assumed a burial cost of \$340/ft^3 and accounted for costs associated with waste processing, transportation, and burial. The resulting waste disposal costs for a conservative license renewal scenario are estimated to be about \$30 million (1994\$) per plant for wastes associated with incremental license renewal activities. Note, however, that actual disposal costs will depend on where the waste will be disposed of (and whether the State compact has developed a LLW disposal facility). Regarding the volume reduction for LLW, the GEIS estimates assumed that the as-shipped volume of compactible wastes would be 1/10 of the as-generated volume: a 10:1 overall volume reduction factor (VRF) for this waste type. Vermont Yankee's VRF may be greater or lower than that assumed in the GEIS evaluations. The estimates in Tables B.4 and B.5 also exclude consideration of further treatment or disposal of existing wastes that have accumulated at particular plants.

Furthermore, it was not the purpose of revised Table 6.10 in the draft GEIS to incorporate the incremental volumes of LLW attributable to refurbishment and continued operations for Vermont Yankee. The assumed envelope from which these data are derived is a BWR that undertakes extensive refurbishment activities in support of license renewal and extended plant operation. The scenario used is quite conservative, and is intended to bound what might occur at any single plant. We expect that most BWRs will have license-renewal-related environmental impacts, including LLW generated, which are considerably less than those depicted in Tables 6.10 and B.5. The final GEIS includes impact initiator estimates for typical or average license renewal scenarios as well as conservative case scenarios. We do not know which scenario will be most representative

of Vermont Yankee. Nevertheless, it will be necessary for the utility and the State of Vermont to plan for accommodation of waste volumes in order to comply with the LLRWPA, as amended.

The volume reduction techniques addressed in the GEIS bound all nuclear power plants. Vermont Yankee still fits within the generic envelope relative to the environmental impacts of a renewed license on onsite LLW storage and off-site LLW disposal.

Concern Nmbr: SWM.008
Topic: Solid Waste Management
Subtopic: Spent fuel and LLW
Associated Comment Nmbr(s): W04.035 W11.053 063.008 079.015 087.080 087.081 087.092
Concern: The EPA, the State of Vermont, and NUMARC expressed concern about the use of Table S-3 for license renewal. They asked that the NRC do the following: (1) explicitly explain Table S-3's applicability to the license renewal period because the table has inherent conservatisms and applies to a wide range of conditions, such as land commitment, reprocessing, and water use for uranium enrichment; (2) clarify that use of extended burn-up fuel during the license renewal period does not invalidate Table S-3; (3) clarify whether it is intended that Table S-3 be used as the method by which the impact of the disposal of 20 years of additional spent fuel and LLW is evaluated, or whether the statement on page 4-110 of the GEIS, "No radiological environmental impact is expected from such disposal" is meant to be a complete evaluation of the additional waste generated; (4) perform a sensitivity analysis to validate the applicability of Table S-3; and (5) explain why Table S-3 is considered an adequate basis on which to evaluate the environmental impact of LLW generated as a result of license renewal since LLW disposal, as required by the LLRWPA, as amended, is greatly different from Table S-3, which assumes disposal by shallow land burial at six established sites.

Given the changing understanding of the effects of radioactivity along with the limitations of Table S-3 and the fact that S-3 revisions are the subject of a separate rulemaking effort, the State of Vermont believes that environmental considerations for radiological consequences cannot be made at this time and must be reserved for plant-specific applications. Hence, the effects of LLW and spent fuel should be Category 3 issues.

Response: In response to the questions about the applicability of Table S-3 to the management of waste associated with license renewal and to the various comments challenging the treatment of the several forms of waste in the draft GEIS and in the proposed rule, the discussion of Table S-3 has been moved from Section 4.8 of the draft GEIS to Chapter 6 of the final GEIS in order to provide a more integrated assessment of the environmental impacts associated with waste management as a consequence of license renewal. Also in response to various comments, the discussion of Table S-3 and of each of the types of waste has been expanded.

Supplemental data are presented in Chapter 6 of the final GEIS in order to extend the coverage of the environmental impacts of the uranium fuel cycle presented in the current Table S-3 and of transportation of radioactive waste presented in the current Table S-4 to radon-222 (^{222}Rn), technetium-99 (^{99}Tc), higher fuel enrichment, and higher fuel burnup. In part, the current Table S-3 and the data supplementing it cover environmental impacts of:

(1) Onsite storage of spent fuel assemblies in pools for 10 years, packaging and transportation to a Federal repository, and permanent disposal; and

(2) Short-term storage onsite of LLW, packaging and transportation to a land-burial facility, and permanent disposal.

The following conclusions have been drawn with regard to the environmental impacts associated with the uranium fuel cycle.

The radiological and nonradiological environmental impacts of the uranium fuel cycle have been revised. The review included a discussion of the values presented in Table S-3, an assessment of the release and impact of ^{222}Rn and of ^{99}Tc, and a review of the regulatory standards and experience of fuel cycle facilities. For the purpose of assessing the radiological impacts of license renewal, the NRC uses the standard that the impacts are of small significance if doses and releases do not exceed permissible levels in its regulations. Given the available information regarding the compliance of fuel cycle facilities with applicable regulatory requirements, the NRC has concluded that, other than for the disposal of spent fuel and HLW, the impacts on individuals from radioactive gaseous and liquid releases will remain at or below the NRC's regulatory limits. Accordingly, the NRC concludes that offsite radiological impacts of the fuel cycle (individual effects from other than the disposal of spent fuel and HLW) are small. ALARA efforts will continue to apply to fuel cycle activities. This is a Category 1 issue.

The radiological impacts of the uranium fuel cycle on human populations over time (collective effects) have been considered within the framework of Table S-3. The 100-year environmental dose commitment to the U.S. population from the fuel cycle (except HLW and spent fuel disposal) is calculated to be about 14,800 man-rem, or 12 cancer fatalities, for each additional 20 year power reactor operating term. Much of this, especially the contribution of radon releases from mines and tailing piles, consists of tiny doses summed over large populations. This same dose calculation can theoretically be extended to include many tiny doses over additional thousands of years as well as doses outside the U.S. The result of such a calculation would be thousands of cancer fatalities from the fuel cycle, but this result assumes that even tiny doses have some statistical adverse health effect which will not ever be mitigated (for example no cancer cure in the next thousand years), and that these dose projections over thousands of years are meaningful. However these assumptions are questionable. In particular, science cannot rule out the possibility that there will be no cancer fatalities from these tiny doses. For perspective, the doses are very small fractions of regulatory limits, and even smaller fractions of natural background exposure to the same populations. No standards exist that can be used to reach a conclusion as to the significance of the magnitude of the collective radiological effects. Nevertheless, some judgment as to the regulatory NEPA implication of this issue should be made and it makes no sense to repeat the same judgment in every case. The NRC concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 should be eliminated. Accordingly, while the NRC has not assigned a single level of significance for the collective effects of the fuel cycle, this issue is considered Category 1. For other Category 1 issues, the impacts will be considered at the individual renewal stage as a means of judging the total impact of an individual license renewal decision. However, the NRC has already judged the impact of collective effects of the fuel cycle as part of this rule.

There are no current regulatory limits for off-site releases of radionuclides for the current candidate repository site. However, if we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, and that in accordance with the NRC's Waste Confidence Decision, a repository can and likely will be developed at some site which will comply with such limits, peak doses to virtually all individuals will be 100 millirem per year or less. However, while the NRC has reasonable confidence that these assumptions will prove correct, there is considerable uncertainty since the limits are yet to be developed and no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The NAS report indicated that 100 millirem per year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 millirem per year. The lifetime individual risk from 100 millirem per year dose limit is about $3x10^{-3}$. Doses to populations from disposal cannot now (or possibly ever) be estimated without very great uncertainty. Estimating cumulative doses to populations over thousands of years is more problematic. The likelihood and consequences of events that could seriously compromise the integrity of a deep geologic repository were evaluated by the DOE in the *Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste* (October 1980). The evaluation estimated the 70-year whole-body dose commitment to the maximum individual and to the regional population resulting from several modes of breaching a reference repository in the year of closure, after 1,000 years, after 100,000 years, and after 100,000,000 years. The release scenarios covered a wide range of consequences from the limited consequences of humans accidentally drilling into a waste package in the repository to the catastrophic release of the repository inventory by a direct meteor strike. Subsequently, the NRC and other federal agencies have expended considerable effort to develop models for the design and for the licensing of a HLW repository, especially for the candidate repository at Yucca Mountain. More meaningful estimates of doses to population may be possible in the future as more is understood about the perfomance of the proposed Yucca Mountain repository. Such estimates would involve very great uncertainty, especially with respect to cumulative population doses over thousands of years. The standard proposed by the NAS is a limit on maximum individual dose. The relationship of potential new regulatory requirements, based on the NAS report, and cumulative population impacts has not been determined, although the report articulates the view that protection of individuals will adequately protect the population for a repository at Yucca Mountain. However, the EPA's generic repository standards in 40 CFR Part 191 generally provide an indication of the order of magnitude of cumulative risk to population that could result from the licensing of a Yucca Mountain repository, assuming the ultimate standards will be within the range of standards now under consideration. The standards in 40 CFR Part 191 protects the population by imposing "containment requirements" that limit the cumulative amount of radioactive material released over 10,000 years. The cumulative release limits are based on EPA's population impact goal of 1,000 premature cancer deaths world-wide over a 100,000 metric tonne heavy metal (MTHM) repository.

Nevertheless, despite all the uncertainty surrounding the effects of the disposal of spent fuel and HLW, some judgement as to the regulatory NEPA implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the NRC concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 should be eliminated. Accordingly, while the NRC has not assigned a single level of significance for the impacts of spent fuel and HLW disposal, this issue

is considered Category 1. Excepting the collective effects previously discussed, for other Category 1 issues, the impacts will be considered at the individual renewal stage as a means of judging the total impact of an individual license renewal decision. However, the NRC has already judged the impacts of HLW disposal as part of this rule.

With respect to the nonradiological impact of the uranium fuel cycle, data listed in Table S-3 concerning land requirements, water requirements, use of fossil fuel, gaseous effluent, liquid effluent, and tailings solutions and solids have been reviewed to determine the significance of the environmental impacts of a power reactor operating an additional 20 years. The nonradiological impacts attributable to the relicensing of an individual power reactor are found to be of small significance. License renewal of an individual plant is so indirectly connected to the operation of fuel cycle facilities that it is meaningless to address the mitigation of impacts identified above. This is a Category 1 issue.

Table S-3 does not take into account long-term onsite storage of LLW, mixed waste, and storage of spent fuel assemblies onsite for longer than 10 years, nor does it take into account impacts from mixed waste disposal. The environmental impact of these aspects of onsite storage are also addressed in Chapter 6 of the final GEIS and the findings are included in the final rule in Table B-1 of Appendix B to 10 CFR Part 51.

Concern Nmbr: SWM.009
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): W10.008 W10.015 W10.016 W10.017 W10.022 011.008 038.026 064.011 079.062a 081.003 081A.008 090.002 090.006 090.007 090.008 096.009
Concern: The Minnesota, Illinois, Massachusetts, New Jersey, and Vermont State agencies; and public interest groups (UCS, Don't Waste California, and the MPIRG) emphasized the need to consider the issue of onsite storage of spent fuel on a site-specific basis for the following reasons: (1) spent fuel storage is not a "tried and true" technology and more specific information and analysis should be provided on the different kinds of dry cask storage technologies used at each site; (2) this issue should be treated as Category 2 so that each facility will have an opportunity to demonstrate that it fits within the bounding criteria; (3) the additional 20 years of spent fuel stored onsite in dry casks (e.g., New Jersey's Oyster Creek Plant) will pose environmental, safety, and emergency planning problems; (4) the acceptability of a dry cask storage facility and increased transportation of radioactive waste resulting from refurbishment and extended operation require more specific examination; (5) the public will have to be convinced that the correct decisions are being made, and the generic bounding calculations used to determine the impact of this issue are not convincing enough; (6) each plant should be required to submit a concrete plan presenting their solution to the spent fuel storage deficiency, including the projected costs associated with construction and operation of additional storage, along with environmental and safety study results; and (7) the local environmental impacts of indefinite onsite storage cannot be determined generically (for example, costs incurred by the States for storing HLW on site will vary dramatically, depending on the availability of a Federal storage site; and there is a large uncertainty surrounding the permanent disposal of a HLW in a repository).

Response: The GEIS addresses extended onsite storage of spent fuel during a renewal period of

up to 20 years. The NRC has studied the safety and environmental effects of the temporary storage of spent fuel after cessation of reactor operation and has published a generic detemination of no significant environment impact (10 CFR 51.23). The environmental data on storing spent fuel onsite in a fuel pool for 10 years before shipping for offsite disposal have been assessed and reported in NUREG-0116, *The Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle* (October 1976), and published in the NRC's regulations (10 CFR 51.51). EAs for expanding the fuel pool storage capacity have been conducted for numerous plants. In each case, a finding of no significant environmental impact was reached.

Radioactive exposures, waste generation, and releases were evaluated and found to be small. The only nonradiological effluent from waste storage is additional heat from the plant that was found to have a negligible effect on the environment. Accidents were evaluated and were found to have insignificant effects on the environment. Dry cask storage at an independent spent fuel storage installation (ISFSI) is another technology used to store spent fuel onsite. The NRC recently amended its regulations in 10 CFR Part 72 to allow power reactor licensees to store spent fuel on site under a general license. The environmental impacts of allowing onsite dry cask storage under a general license were assessed in an EA and found to be insignificant. Further, the NRC has conducted EAs for seven specific licensed ISFSIs and has reached a finding of no significant environmental impact for each site. Each EA addressed the impacts of construction, use, and decommissioning. Potential impacts that were assessed include radiological impacts, land use, terrestrial resources, water use, aquatic resources, noise, air quality, socioeconomics, radiological impacts during construction and routine operation, and radiological impacts of off-normal events and accidents. Trends in onsite spent fuel storage capacity and the volume of spent fuel that will be generated during an additional 20 years of operation are considered in the GEIS. Spent fuel storage capacity requirements can be adequately met by ISFSIs without significant environmental impacts. The environmental impacts of onsite storage of spent fuel at all plants have been adequately assessed in the GEIS for the purposes of an environmental review and agency decision on renewal of an operating license; thus, no further review within the license renewal proceeding is required. This provision is relative to the license renewal decision and does not alter existing NRC licensing requirements specific to onsite storage of spent fuel.

Concern Nmbr: SWM.010
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): W10.023
Concern: A representative from the Iowa Department of Commerce raised a question regarding constraints on electrical output as a result of spent fuel storage problems. Specifically, he asked (1) if longer burn-ups for nuclear fuel would lead to power derating: if it implies running at less than full power for extensive periods of time; and (2) if the burn-up period will be longer in the future compared to the present.

Response: Longer burn-up fuel is highly variable within the industry, with spent fuel changeouts ranging from 12 months to 18 months, or even longer. This could affect the efficiency of a particular plant, but the overall effect will vary from one plant to another. Ultimately, the effect of longer burn-up fuel on spent fuel pool storage (e.g., increased cost) will be just one of the many factors affecting a utility's decision, and is beyond the scope of this rulemaking process.

Concern Nmbr: SWM.011
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): W10.026 038.042 038.043 038.044 038.045 038.047 038.048 054.062 054.063 075.006 079.020 079.062b 079.097 087.087 096.012
Concern: The EPA, and the Michigan, Maryland, Minnesota, Wisconsin, Vermont, and New Jersey State agencies wanted the following additional information concerning the spent fuel issue: (1) explicitly address the impacts of spent fuel (even though they are managed under10 CFR Part 60) since the impacts are not negligible (EPA); (2) include in Table 6.12 on spent fuel inventories the annual generation rates for the 20-year renewal period (to provide information on the transportation and disposal system requirements) (MI); (3) provide additional discussion on ultimate disposal, including the current site characterization problems in Nevada, the purpose and effectiveness of the Nuclear Waste Policy Act (NWPA), the fact that defense wastes and the additional waste generated by renewing plant licenses may require a second repository, and the possibility that at-reactor storage will serve as the ultimate repository (MI); (4) address the potential need for a second repository (if a second high-level repository site has to be located and licensed, there may be concerns from citizens about the possibility that it will be located in their State) (WI); (5) assess the likelihood of opening a spent fuel repository and include in that analysis an indication of a timeframe for its opening, as well as how costs of delay might affect the determination of need and of cost-effective alternatives (see GEIS, p. 6-36) (MN); (6) include the assumptions for the cost of spent fuel storage since they could not be found in Chapter 6 or 9, or Appendix H (the ultimate cost for disposal for the 40-year licensing is estimated at over $30 billion and may not be sufficient for the whole program) (MD); (7) clarify the discussion of spent fuel pool expansion (MD); (8) update the list of 9 plants losing full core discharge capacity since it is incomplete (the list should include plants contracting for, constructing, or operating ISFSIs as depicted in an enclosed table) (MD); (9) clarify the GEIS conclusion that ISFSIs use little land area because it is misleading (MD); (10) point out that the typical approach of most utilities is to defer taking action to increase their spent fuel capacity as long as possible, to rerack their spent fuel until the in-pool capacity is near depletion, and then to contract for an ISFSI (MD); (11) add rules governing the public, such as 10 CFR 72.104 and 10 CFR 20.105, to "Worker and population exposures are minimal" (see p. 6-36, paragraph 3) (MD); and (12) add Oyster Creek to the list of plants that will exhaust their spent fuel pool's storage capacity by the year 2000 (p. 6-29, lines 5–11) (NJ).

Response:

1. Nonradioactive and radioactive releases from spent fuel whether stored on site, or in a Federal repository are estimated to be well within the total release values given in Table S-3 (10 CFR 51.51a). However, the impacts associated with siting, constructing, and operating a spent fuel repository and/or MRS will be explicitly addressed in environmental studies associated with Yucca Mountain, other repository candidate sites, and/or selected MRS or other permanent repository sites.

2. The impact of spent fuel inventories is directly related to the number of reactors that apply for license renewal. Terminating operations at plants that are not relicensed will tax the spent fuel storage systems with 4 to 5 years worth of spent fuel in just one year due to reactor defueling. The usefulness of projected spent fuel inventories for a 20-year renewal

period would be of little value without reasonable knowledge of how many utilities will decide to renew their operating licenses. The DOE is responsible for taking possession of spent fuel for interim storage in the MRS, which would be followed by permanent disposal in underground repositories. With regards to spent fuel, the issue relevant to license renewal is whether spent fuel could be stored safely and without significant environmental impacts. Therefore, discussions related to constructing and operating a repository, site characterization problems, the NWPA, and defense waste are outside the scope of the GEIS.

3. See response 2 above.

4. As the analysis shows, the current candidate site for a HLW repository, Yucca Mountain, Nevada, is limited by law to 70,000 metric tons of spent fuel. Assuming most nuclear plants currently in operation are relicensed for an additional 20 years, continued onsite storage for upwards of 50,000 metric tons of spent fuel will be necessary until a second repository is built, which may take several decades. The commenter is correct in stating that the question of where the additional spent fuel will go is an important issue—it is also an issue that must be settled by the Congress or the DOE. A second repository for high-level nuclear wastes was, at one time, considered by the DOE. The DOE terminated this program in 1986 under the assumption that it would not be needed (*DOE News*, May 28, 1986). Congress will likely charge the DOE with the responsibility of reinvestigating the feasibility of such a repository at some time in the future.

5. Estimating the likelihood of the opening of a spent fuel repository is highly problematic but, at the same time, not absolutely essential for the analysis of the environmental impact of spent fuel in Chapter 6 for two reasons. First, the analysis has found that even if efforts to open a spent fuel repository are delayed—and the DOE estimates the opening for such a facility no sooner than year 2010—virtually all utilities can store their spent fuel on site. Second, as the analysis has also shown, even if efforts to identify a host-site for an MRS fail to provide for a completed interim spent fuel storage facility by 1998—as is likely due to the need for engineering studies, EAs, and even host-community compensation packages— utility storage of spent fuel onsite is a viable alternative. The volume of spent fuel requiring onsite storage could be 50 percent greater than at the end of the initial 40-year license, if a permanent repository or MRS does not become available, as planned. Thus, the site-specific review will consider the licensee's plans for on-site storage of spent fuel.

   The concerns expressed over cost of spent fuel disposal are outside the scope of the GEIS analysis of solid waste management. The ability of the HLW program to cover its expenses within the current utility fee structure also is beyond the scope of the analysis, but is a concern for the DOE. Furthermore, cost is no longer a consideration in the license renewal review.

   Finally, while it is acknowledged that the costs and impacts of a second repository must be evaluated, such an assessment is beyond the scope of the GEIS.

6. Since cost is no longer a consideration for the license renewal decision, information on cost assumptions is immaterial to the analysis.

7. Expansion of spent fuel pools means expanding the usable space of the pools through dense-racking, double-tiering, and rod consolidation.

8. The list of plants losing full core discharge capacity has been replaced in the revised GEIS by Table 6.13 which shows the projected year that pool storage space will be filled for ten sample plants.

9. The observation is valid and has been noted in the analysis. However, it does not change the analysis for the following reason: "Land used" for ISFSIs means disturbed acreage dedicated to the facility itself. The assumption is that, on an already disturbed plant site, the additional impacts from spent fuel storage facilities emanate from additional construction, which may have an effect upon sensitive ecological resources. Additional land required as an "intruder" exclusion area, or to limit dose exposure does not pose any additional impacts to sensitive resources. The GEIS analysis includes the land area encompassed by ISFSIs and their exclusion areas for those plants cited in the observation.

10. The survey of utilities undertaken for the GEIS, and whose results are depicted in Table 6.13, suggests that to "defer taking action" is a subjective notion—some utilities are clearly thinking now about spent fuel storage problems that may not arise until later. The observation does not change the analysis.

11. The NRC agrees with the commenter. The relevant regulations have been cited in Chapter 6. Again, the statement on land use for ISFSIs is meant to describe the disturbed acreage affected by construction activities which could, in turn, have an impact upon aquatic and terrestrial ecological resources.

12. The observation pertaining to the inconsistency on page 6-29 is correct. The noted passage in the draft GEIS has been replaced by Table 6.13, which shows the projected year that pool storage space will be filled for those ten plants in the sample. However, as discussed in the methodology section of the chapter, these are not the only plants industrywide that are running out of storage (the citation provided provides that list).

Concern Nmbr: SWM.012
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): W10.027
Concern: A Michigan State representative suggested that the NRC clarify how the public can submit comments on the spent fuel issue if it is resolved by the GEIS as a Category 1 issue.

Response: Although spent fuel is Category 1, the public has the opportunity to comment on this issue and provide new information challenging the GEIS finding at the time of the site-specific review. See also the response to Concern SWM.009.

Concern Nmbr: SWM.013
Topic: Solid Waste Management
Subtopic: Mixed waste
Associated Comment Nmbr(s): W10.013 054.071 087.090
Concern: The EPA and the Minnesota and Illinois State agencies expressed concern that the EPA's recent policies on mixed waste have not been addressed in the GEIS, and there is no clear guidance for the States on how to deal with this issue. Specifically, the EPA suggested that the NRC discuss with the agency the applicability of ALARA to the mixed waste issue since the EPA has sponsored work on the applicability of ALARA to the RCRA requirements, the intent of which is to provide guidance to mixed waste petitioners seeking exemptions from RCRA requirements. The State agencies also believe that it would be helpful to include a discussion of the recent EPA policy statement on mixed wastes, which states that although RCRA does not allow for the long-term storage of mixed wastes, the EPA will consider enforcement under RCRA a low priority if the generator follows certain management practices described in the policy statement. Moreover, because the EPA and the NRC have not yet prepared a joint regulation on mixed waste, it is difficult to determine what States need to do in terms of licensing requirements for mixed waste.

Response: The NRC agrees with the suggestion that the EPA policy of August 29, 1991 on enforcement of RCRA wastes at facilities generating mixed wastes be included. Reference to this policy is provided in Sections 6.5.5.1 and 6.5.5.2 of the revised GEIS. Actually, this policy has been renewed for an additional two-year period (59 FR 18813).

Concern Nmbr: SWM.014
Topic: Solid Waste Management
Subtopic: Mixed waste
Associated Comment Nmbr(s): W10.014 011.007 075.009 079.018 087.089 096.008
Concern: The EPA and several State agencies expressed concern about the treatment of the mixed waste issue. The EPA believes that the impacts of mixed waste should be designated as a Category 2 issue because of the lack of a resolution to the question of where disposal capacity for mixed waste will be sited (onsite or at a licensed facility). Moreover, States will require utilities to address this issue in the NRC's relicensing process. Representatives from the States of Illinois, New Jersey, and Vermont believe that plants which do not have access to a mixed waste disposal facility should be required to include an assessment of the impacts of protracted onsite storage of the mixed waste in their environmental report. This would be similar to the requirements associated with LLW. Since there are currently no disposal facilities in the U.S. for such waste, it will certainly have to be stored onsite for an unknown period of time. Therefore, a site-specific discussion of onsite storage of mixed waste should be required in the applicant's environmental report. A representative from the State of Wisconsin added that the extent of asbestos removal as part of refurbishment and its possible contamination with radionuclides (see p. 22, lines 38–39) should also be addressed.

Response: The issue of on-site storage of mixed waste is designated as Category 1. Based on the information considered in the GEIS analysis, the NRC finds that the environmental impact of storing wastes (including mixed waste) on site is of small significance for all plants; therefore, a site-specific review of this issue is not required for the purpose of making a determination to issue

a renewed license. Chapter 6 addresses the delays and uncertainties associated with providing mixed waste disposal capacity, but concludes that capacity will be made available when needed for facilities to be decommissioned consistent with NRC requirements. The NRC does not see the need to address asbestos as a separate waste category.

Concern Nmbr: SWM.015
Topic: Solid Waste Management
Subtopic: Nonradiological waste
Associated Comment Nmbr(s): W10.018 087.083
Concern: The EPA and a representative from the public interest group, Don't Waste U.S., questioned the conclusion that there are no environmental concerns (i.e., Category 1 ranking) with the nonradiological waste disposal issue. The EPA stated that there was no information provided to substantiate such a conclusion. It suggested that the GEIS include a paragraph on solid waste management that acknowledges the Pollution Prevention Act of 1990 (PPA) and endorses its policy that ". . . pollution should be prevented or reduced at the source whenever feasible . . . ." (see Section 6.2, p. 6-3 and p. 10-24.) The public interest group representative stated that problems at some reactors warrant review of this issue on a case-by-case basis (e.g., Diablo Canyon being responsible for the deaths of abalone species in California due to metallic output and large volumes of water effluent, and Comanche Peak contaminating so much groundwater from 11 huge toxic waste dumps that the quality of its water supply is in question).

Response: Disposal of non-radioactive hazardous solid waste from all nuclear power plants is governed by RCRA, and liquid releases are governed by the NPDES requirements. License renewal would not cause any significant changes to the system generating such waste. Regulations are currently in place to handle nonradioactive waste, and it is anticipated that the impact of continued operation for an additional 20 years would be small. Hence, a site-specific examination of this issue is not necessary. There is ample disposal capacity at all sites for the possibly large quantities of construction debris that may be generated from refurbishment activities. As discussed in Chapter 3 of the GEIS, the amount of land that would be disturbed from these activities should be about 9 acres, a fraction of the plant area for even the smallest nuclear power plant sites. This is considerably smaller than the 50 to 100 acres of land typically disturbed during original construction.

Concern Nmbr: SWM.016
Topic: Solid Waste Management
Subtopic: Categorization/SWM issues
Associated Comment Nmbr(s): W10.010 031.004 081A.006 093.009
Concern: The New York and Illinois State agencies, and public interest groups (Don't Waste California and the NECNP) believe that the waste management issues should be designated as Category 2 or 3 for the following reasons. First, the high-level, low-level, and mixed waste assumptions are based on the premise that facilities for waste disposal will be developed, or that it will be economically and environmentally acceptable to develop the necessary storage capacity onsite at the time of license renewal; however, no accurate assessment of this issue can be made until real experience is gained from the actual operation of facilities. Second, the costs of the

specific method for accommodating waste onsite must be considered in calculating the benefit of relicensing decisions, and these determinations are meaningful only on a plant-specific basis.

Response: The waste management issues, including the handling, on-site storage, and disposal of LLW, mixed waste, and spent fuel, are now designated as Category 1 (based on the new definitions of issue categories). See response to Concerns SWM.001, SWM.009, and SWM.014. The concerns over cost expressed in this comment are outside the scope of the GEIS's analysis of solid waste management. Moreover, cost is no longer a consideration in the NRC's NEPA review of a license renewal application.

Concern Nmbr: SWM.017
Topic: Solid Waste Management
Subtopic: Waste handling
Associated Comment Nmbr(s): W10.005
Concern: A Don't Waste U.S. representative would like to see U.S. reactors ranked in terms of their site suitability for waste handling. The commenter pointed out that as a result of the Vermont Yankee site characterization plan, the general NRC recommendation is that the site, right on the banks of the Connecticut River, is unsuitable for long-term LLW storage.

Response: SECY-94-198, issued on August 1, 1994, provides the latest NRC guidance on the extended storage of LLW. As a part of the normal regulatory process, the NRC reviews (every five years) the LLW storage capacity at each plant. Should a licensee decide to expand on-site storage capacity, then a licensee may do so under 10 CFR Part 50.59 unless (1) a USQ exists; (2) a change in technical specification is required; or (3) an existing license condition needs to be changed to accommodate LLW on-site storage. A licensee amendment under 10 CFR 50.90 is required if the 10 CFR 50.59 tests are not met. There is no need to rank plants in terms on their site suitability for waste handling and storage because the licensee's (operating reactors) capabilities have been evaluated and are periodically reviewed by NRC staff. In the event that an increase in on-site storage capacity becomes necessary, a licensing framework already exists to ensure protection of public health and safety.

Concern Nmbr: SWM.018
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 017.001–017.026
Concern: The Midwest Compact suggested updates to the discussion of solid waste management in Chapter 2 and 6, such as the following: inclusion of dewatering and evaporation as volume reduction techniques; consideration of the impact of deferred decommissioning on future disposal facilities; and consideration of volume reduction that takes place at off-site processing and treatment facilities.

Response: The text in Chapter 6 of the GEIS has been revised to incorporate the suggested changes about the volume reduction techniques and to acknowledge the volume reduction taking place at off-site treatment facilities.

Concern Nmbr: SWM.019
Topic: Solid Waste Management
Subtopic: Radioactive waste disposal
Associated Comment Nmbr(s): 065.003
Concern: A member of the Michigan Citizens Action Committee believes that the NRC must allow for the nuclear waste issue to be a priority in the relicensing process since there are significant health issues surrounding existing waste disposal sites. Currently in Michigan, for example, MICHRAD (waste generator) must store all nuclear waste onsite since it has not been allowed to dispose of the waste at Barnwell, Beaty, and Hanford. In the economic analysis of relicensing, the NRC must incorporate all costs including the following: uranium mining, reprocessing, and power plant construction and operation costs; HLW, LLW and BRC disposal costs; and the costs of operating and closed LLW disposal sites.

Response: The waste management issues, including LLW, mixed waste, and spent fuel storage and disposal, are now designated as Category 1 (based on the new definitions of issue categories). The fact that these issues are Category 1 does not preclude any interested party from presenting any new information challenging this finding at the time of the site-specific review. Regarding the economic analysis performed for the draft GEIS, the NRC has decided not to consider cost as a factor in its NEPA review.

Concern Nmbr: SWM.020
Topic: Solid Waste Management
Subtopic: Radioactive waste disposal/Land use
Associated Comment Nmbr(s): 083.003 088.003
Concern: The SRPEDD believes the issue of on-site land use should be given more consideration than appears in the GEIS, particularly in the area of on-site storage of radioactive wastes because there is still no permanent HLW disposal facility. This is a long-range land use planning issue which has significant cumulative impacts. Similarly, the Cape Cod Commission, a local planning group, disputes the finding that the issue of land use for radioactive waste disposal is a Category 1 issue since there still is no permanent method for HLW disposal. Therefore, onsite storage of these wastes would still occur.

Response: The issues of on-site LLW, mixed waste and spent fuel storage are designated as Category 1 (based on the new definitions of issue categories). Moreover, under the WCR, the NRC has determined that spent fuel can be safely stored onsite for at least 30 years beyond the licensed life of operation (including the renewed license). Thus, continued on-site storage of spent fuel is not expected to present an environmental problem even if there are delays in the openi. of a permanent repository or an MRS.

Concern Nmbr: SWM.021
Topic: Solid Waste Management
Subtopic: Uranium fuel cycle
Associated Comment Nmbr(s): 079.016 106.005 A113.005
Concern: The State of Vermont took exception to the NRC finding in Section 4.8.9 that the uranium fuel cycle could be evaluated as a Category 1 issue because the land use and radiological

impacts of the fuel cycle have yet to be resolved. It cited the following concerns: (1) spent fuel issues cannot be resolved until covered by public law, and a disposal site is in place (Category 3); (2) land use issues must be compared against specific alternatives (Category 3); and (3) radiological consequences of LLW are dependent on the availability of access to disposal sites (Category 2). Consequently, the uranium fuel cycle should be a Category 3 issue. Similarly, the Deerfield River Compact contended that no assessment has been made of the number or the impact of additional fuel manufacturing facilities that will likely be needed for extended operation.

Response: The NRC has not changed its finding on the radiological and nonradiological impacts of the uranium fuel cycle. These issues remain Category 1. The waste management issues (including consideration of on-site storage of spent fuel) are also Category 1 since the NRC's analysis has found that the environmental impacts are expected to be of small significance for all plants. For spent fuel, this finding is further supported by the WCR. The concern regarding permanent disposal of spent fuel is a responsibility of the DOE. Land use issues arising from license renewal versus those arising from other alternative energy sources will be addressed in the site-specific review. However, land use issues related to the uranium fuel cycle and the impacts of additional fuel manufacturing facilities are not unique to license renewal. A regulatory framework already exists to address these issues, as they may arise either during the current operating license term or the renewed license term.

Concern Nmbr: SWM.022
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 038.046
Concern: The MDNR noted that the GEIS erroneously states that spent fuel is handled and stored underwater (p. 5-9). The GEIS ignores the fact that nuclear plants are already beginning to use dry cask storage. This should be addressed in Chapter 5. A Minnesota State agency pointed out a mathematical error on page 6-35, lines 14, 15, and 18. The value 52,000 should be changed to 42,000 MTHM.

Response: Chapters 5 and 6 of the revised GEIS acknowledge that much spent nuclear fuel is currently stored in dry cask storage facilities. Regarding the mathematical error pointed out on page 6-35, this is no longer an issue since the text has been revised and the statement alluded to has been deleted.

Concern Nmbr: SWM 023
Topic: Solid Waste Management
Subtopic: LLW disposal-volume
Associated Comment Nmbr(s): 035.011
Concern: The PDER noted that the GEIS assumes that all activities listed in Table 2.6 will occur during the last 10 years, at a given plant. It pointed out that many plants have included or will include these activities during their original operating license term, and prior to the 10-year refurbishment period. Therefore, it is expected that the actual volume of LLW generated as a

result of refurbishment/replacement activities will be considerably lower than the projected volume reported in Section 6.3.1.2 of the GEIS.

Response: Projected waste volumes were based on extrapolations from average current trends. It is acknowledged that many utilities already have undertaken major refurbishments under their original licenses and thus will not have to undertake these waste generating activities as a condition for license renewal. Nevertheless, the assumption that many utilities would undertake these activities in the 10-year period prior to license renewal was a scenario used in order to provide more conservative bounds for waste impacts (i.e., what are the realistically greatest volumes of waste that could be expected from the relicensing action). The actual volumes of LLW generated by some plants may, in fact, be smaller than the projected volumes discussed in Chapter 6 of the GEIS. However, the larger estimate provides a more conservative scenario for assessing possible impacts to compacts as well as utilities.

Concern Nmbr: SWM.024
Topic: Solid Waste Management
Subtopic: LLW disposal-volume
Associated Comment Nmbr(s): 035.012
Concern: The PDER noted that the values given for the average incremental increase in LLW generation during the 10-yr renewal refurbishment activities for BWRs (3200 ft^3) and PWRs (7970 ft^3) are incorrect. These numbers should be revised as follows:

Ave. incremental increase for BWRs = ((8600 ft^3 x 4) + 23450 ft^3)/10 = 5793 ft^3/yr
Ave. incremental increase for PWRs = ((9500 ft^3 x 4) + 70200 ft^3)/10 = 10820 ft^3/yr

Table 6.5 should also be modified to include the projected activity (Ci) and waste class (A, B, or C) for the listed refurbishment/life extension activities.

Response: The numbers cited in the text have been corrected to reflect the same numbers shown in Table 6.10 (Table 6.5 in draft GEIS). The NRC does not see the necessity for including infomation on the projected activity of LLW generated (and the corresponding waste class) for the refurbishment activities.

Concern Nmbr: SWM.025
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 035.013 035.014 035.015
Concern: The PDER noted that the average quantities of GTCC LLW listed in Table 6.6 seem too low for BWRs and too high for PWRs. It cited a DOE report (DOE/LLW-114, dated August 1991), which estimates the GTCC generation rates in the form of cartridge filters to be 3.5 ft^3 to 6.5 ft^3 per plant per fuel cycle for BWRs and 2.4 ft^3 to 3.5 ft^3 for PWRs. These numbers translate to 2,520 to 4,680 ft^3 for BWRs and 3,511 to 5,121 ft^3 for PWRs for 40 years of plant operation. The estimated volume of decontamination resin GTCC (not listed for BWRs in Table 6.6) is 100 Ft^3/BWR or 1,900 ft^3 for all BWRs and 150 ft^3/PWR or 7,650 ft^3 for all PWRs through shutdown.

Some PWRs will probably require replacement or removal of various components as indicated in Table 2.6. This probably will result in more than 11 ft^3 during the refurbishment period. Furthermore, the State agency pointed out that Table 6.9 has 8 plants for the Appalachian Compact instead of 11 operating plants. Finally, the numbers reported for annual LLW shipments in Sections 2.2.4.4 and 6.6.1.1 are not consistent. It is also not clear whether the reported numbers include shipments made to the processors or only those shipped directly to the burial sites.

Response: All data on spent fuel and radioactive waste inventories were updated using DOE's *Integrated Database for 1993: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, Rev. 9.

The comment that there are 11 plants (instead of 8) for the Appalachian Compact is correct. However, enhancements made to Chapter 6 of the GEIS led to the deletion of the table referred to (i.e., Table 6.9 in draft GEIS).

The numbers for annual LLW shipments in draft Section 6.6.1.1 of the draft GEIS are correct. The numbers in Section 2.2.4.4 are incorrect and have been changed to be the same as those in draft Section 6.6.6.1.

Concern Nmbr: SWM.026
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 054.064
Concern: The State of Minnesota pointed out that each plant should be required, as part of its license renewal application, to indicate how spent fuel would be stored at each site until the DOE acceptance begins (see GEIS, p. 6-36).

Response: The NRC agrees with the assertion that each plant should be required to indicate how its spent fuel will be stored until the DOE acceptance begins is a reasonable point. Under current NRC policy—independent of the GEIS process—if a licensee applies for license renewal, that licensee must indicate that there are no unreviewed and/or unresolved safety issues in at-reactor storage of spent fuel.

If there is no second repository, or MRS, the spent fuel will remain on site—probably in dry cask storage facilities. The ability of these facilities to accommodate spent fuel is addressed in Chapter 6 of the GEIS. For dry cask storage, a licensee must use an NRC-certified cask and: (1) perfom written evaluations showing there are no USQs; (2) provide adequate safeguards; (3) notify the NRC whenever a new cask is added to storage; and (4) maintain up-to-date records. These guidelines remain in force during the license renewal period.

Concern Nmbr: SWM.027
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 054.065
Concern: The State of Minnesota contends that spent fuel should be a Category 3 issue because of the fact that each plant planning to use dry cask storage must obtain an NRC Part 72 license, which requires an environmental report.

Response: The issue of on-site storage of spent fuel is designated as Category 1 (based on the new definitions of issue categories). The analysis of the environmental impacts of both wet and dry storage of spent nuclear fuel included the review of the application of these methods in the sample of plants considered, and throughout the industry. Plants with limited spent fuel storage capacity have been turning to pool expansion, reracking of spent fuel (i.e., bringing spent fuel bundles closer together or "dense racking"), longer fuel burnup to delay spent fuel unloading, and above-ground dry storage due to deferral of an MRS or permanent repository—the impacts of these methods have been documented.

It has also been acknowledged that environmental reports are required for spent fuel storage in dry cask configurations (per 10 CFR Part 72). The purpose of these reports is to determine if plants can fit within the bounds of no significant impact expected through reliance upon this storage method. The crucial issue is whether or not the Monticello plant, as an example, falls within the bounds of safety, reliability, and minimal environmental impact—as demonstrated in its environmental report—found to be true at other plants.

Concern Nmbr: SWM.028
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 054.066
Concern: The State of Minnesota noted that all quantitative data reported in the GEIS tables should be as complete as possible in order to present an accurate picture of LLW generation by nuclear plants. It recommended that the NRC work closely with the compacts and unaffiliated States to justify and verify all the figures used.

Response: In the revised GEIS, all data on spent fuel and radioactive waste inventories were updated using the DOE's *Integrated Database for 1993: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, Rev. 9.

Concern Nmbr: SWM.029
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 054.067
Concern: The State of Minnesota took issue of a statement in Section 6.3.3.3 of the GEIS, which states that "consummation of an agreement with (another) compact or unaffiliated State for interim storage could suffice" to provide disposal capacity to a plant's LLW. No such agreements have been worked out as yet, and it is unclear whether any compacts or States with operational

facilities would be amendable to this if approached. If that statement remains in the final GEIS, additional qualifying text should be included to fully explain these caveats and their implications.

Response: The statement referred to has been deleted in the revised GEIS. The discussion of LLW disposal and the role of compacts has been updated to clarify issues pertaining to off-site disposal that LLW compacts, compact host-site disposal States, and unaffiliated States may face during the license renewal period (see Sections 6.5.4.3 and 6.5.4.6 of the revised GEIS).

Concern Nmbr: SWM.030
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 054.069
Concern: The State of Minnesota noted that the GEIS does not address the implications of the following: the disposal of additional LLW generated over a longer period of time, the additional amounts of LLW from refurbishment activities, and the timing of the generation of decommissioning wastes on the compact's planning and decision making.

Response: The comment is correct insofar as host State LLW facilities may only be licensed for 20 years of operation—after which time compacts must find new host States and new disposal facilities. It is true that the exact timing of decommissioning is important to State and compact planning. However, license renewal effectively sets the decommissioning time up to 20 years later than anticipated. The requirements for evaluating the environmental impacts of decommissioning activities are already covered in existing NRC regulations (e.g., 10 CFR 30.36, 40.42, and 50.82). The GEIS analysis has shown that the environmental impact of additional LLW generated during license renewal on decommissioning is relatively small (see Chapter 7 of the GEIS). The timing of the generation of decommissioning wastes is not an issue unique to license renewal. The utilities will have to work with State officials regarding the plans for ultimate disposal of LLW. Moreover, since States have the statutory authority to consider how the electric power generation of a particular nuclear plant supports the overall power generation requirements of a State or region, it is expected that the effects of waste generated by a nuclear plant will be part of a State's determination of need for power.

Concern Nmbr: SWM.031
Topic: Solid Waste Management
Subtopic: LLW storage/disposal
Associated Comment Nmbr(s): 038.039 054.070
Concern: Maryland and Minnesota State agencies expressed concern about the discussion of the LLW storage and disposal issue. Maryland pointed out that the LLW disposal summary should include a statement which would require the plant to submit a plan for extended, indefinite, on-site LLW storage. For example, the future of disposal access after December 1992 is uncertain for plants located in the Southeast Compact because of delays in siting the next host disposal site. Minnesota observed that the "rule of thumb" understanding between the NRC and the generators has been that on-site storage of LLW is limited to 5 years. Yet, the GEIS states that typical on-site storage is from 1 to 3 years. Moreover, the GEIS states that if off-site disposal facilities will not be available according to the schedule given in Table 6.8, then the effects of extended storage

will need to be evaluated. It believes that it is unlikely that disposal capacity will be available according to this schedule since progress in siting has been generally slow.

Response: The discussion of LLW storage and disposal in Chapter 6 of the GEIS has been updated. The issues of on-site storage of LLW is designated as Category 1 (based on the new definitions of issue categories). The analysis in the revised GEIS indicates that the environmental impacts are of small significance for all plants. Guidance on extended storage of LLW on site is provided in SECY-94-198, whereby if a plant is planning to expand its on-site LLW storage capacity, it must conduct a safety analysis to determine if an amendment to its Part 50 license is needed pursuant to the requirements of 10 CFR 50.59. Also, as indicated in SECY-94-198, NRC staff reviews a licensee's on-site storage capacity for LLW every 5 years, but does not place a limit on how long LLW can be stored on site.

Concern Nmbr: SWM.032
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 087.095
Concern: The EPA noted that the discussion (in Section 6.5) provided little indication about the technical feasibility and availability of dry storage methods to accommodate spent fuel at each nuclear power plant. Hence, the EPA finds it difficult to agree with the conclusion that dry storage can accommodate the additional spent fuel generated at the end of the renewal period.

Response: As stated in the draft GEIS, the NRC has determined that spent fuel can be stored on site for at least 30 years beyond the licensed life of operation of nuclear power plants, including the license renewal term. Besides dry storage, a plant can pursue various storage options such as enlarging spent fuel racks, adding racks to existing pool array, and increasing fuel burnup. Although not all plants applying for license renewal will use or require use of ISFSI methods or the on-site dry storage method, the NRC has determined that these methods are sufficiently well-developed, safe, and dependable to permit generic licensing for any nuclear plant licensee, provided the reactor licensee notifies the NRC of the intent to utilize an ISFSI, uses NRC-certified casks, and follows all specified conditions for their use, as stated in 55 FR 29181. The ISFSIs are intended as interim storage facilities, to store spent fuel up to 20 years after a plant ceases to operate, until a permanent repository or MRS becomes available. The Surry, Robinson, Oconee, Brunswick, Calvert Cliffs, Ft. St.Vrain, and Palisades nuclear power plants either are using or are pursuing the use of dry storage as an option for spent nuclear fuel storage. EAs for the ISFSIs at these plants indicate that long-term material and system degradation effects are minimal, and that licensees can ensure use of such systems in full compliance with health, safety, environmental, and safeguards and security criteria (55 FR 29181).

Concern Nmbr: SWM.033
Topic: Solid Waste Management
Subtopic: LLW storage/disposal
Associated Comment Nmbr(s): 079.017 096.010
Concern: New Jersey and Vermont State agencies noted that the GEIS statement (p. 6-25) that "all LLW compacts and declared unaffiliated States are planning to accommodate anticipated

waste streams from license-renewal-associated refurbishment and an additional 20 years of normal operations (Table 6.8)" appears only to refer to those LLW compacts and declared unaffiliated States that are encompassed by the sample of plants analyzed in the section. If so, then the statement should be revised to explicitly state this. If not, the statement is inconsistent with a previous statement on the same page that some compacts assume that all nuclear power plants in their regions may be decommissioned after expiration of their current operating license.

Response: The seemingly confusing statement referred to in the GEIS has been modified. The statement about some compacts assuming that all nuclear plants in their regions may be decommissioned after expiration of their current operating license has also been deleted.

Concern Nmbr: SWM.034
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 096.011
Concern: A Vermont State agency commented that the GEIS statement (p. 6-28, lines 39–40) that DOE estimates that site selection for an MRS could occur as early as 1992, with subsequent acquisition of spent fuel from utilities in 1998, is too optimistic. It cited a September 1991 report by the GAO, which indicated that a facility is unlikely to be available by 1998. This uncertainty and its impact should be addressed in the GEIS.

Response: The GEIS statement has been modified. The availability of an MRS by 1998 is uncertain. Current projections indicate that the geologic repository may be available by 2010.

Concern Nmbr: SWM.035
Topic: Solid Waste Management
Subtopic: Spent fuel/LLW
Associated Comment Nmbr(s): 014.001
Concern: The Deerfield River Compact recommended that "federal legislation be filed to address the environmental review of the license renewal applications for nuclear plants" because the process proposed by the NRC eliminates public involvement in plant relicensing. The agency suggests that the legislation include the following: (1) a site-specific EIS; (2) a cost-benefit analysis of alternatives to license renewal, including conservation and load management, and consideration of all related costs of production; (3) incorporate the conclusions of any comprehensive Resource Management Plans that have been adopted by the State; and (4) if no comprehensive plan exists, the license applicant should make available adequate funding to allow the State to develop such a plan. These recommendations are apparently prompted by the agency's concern about the large volume of spent fuel and LLW generated as a result of license renewal.

Response: A site-specific SEIS will now be prepared for each license renewal application. No cost-benefit analysis will be performed as part of the NRC's license renewal review. The NRC acknowledges that the economic determination of the merits of license renewal is the State's responsibility. Moreover, in determining whether a particular plant will be issued a license to continue operation beyond 40 years of initial operation, the NRC will take into consideration any

information found in the State's resource management plan that would be relevant to the environmental comparison of alternative energy sources, which will be performed on a site-specific basis as part of the license renewal review process. Regarding the recommendation that the license renewal applicant provide funding to allow the State to develop a resource management plan, the NRC does not believe that it has a statutory authority to require that such action be taken.

Concern Nmbr: SWM.036
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 055.006
Concern: YAEC disagreed with the bounding assumptions used in determining LLW disposal, further noting that the upper limits used for generated LLW are very conservative and that this could raise unwarranted concerns and unjustified resistance to the general concept of license renewal. (This concern is the opposing view to SWM.003.)

Response: Baseline data for LLW generation were provided by the *Integrated Database for 1993: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics* (DOE/RW-0006) developed by ORNL for the DOE. Data in this inventory are derived from the industry and, thus, are empirically based. It is not a worst-case extrapolation. It provides a realistic basis for compact planning by bounding the likely impacts of LLW. Furthermore, the data are presented in the GEIS as background information, and not as basis for bounding analysis.

See also response to SWM.007 regarding the estimates of additional, incremental waste volumes associated with refurbishment. The revised GEIS includes impact initiator estimates for typical or average license renewal scenarios as well as conservative case scenarios. Tables 6.10 and B.5 of the revised GEIS contain data for the conservative license renewal scenarios and Table B.4 contains data for the likely scenarios.

Concern Nmbr: SWM.037
Topic: Solid Waste Management
Subtopic: LLW storage
Associated Comment Nmbr(s): 087.084
Concern: The EPA noted that a discussion is needed regarding how D&D impacts may change if LLW is stored onsite for the 20-year license renewal period (see Section 6.3.2, p. 6-16, and p. 10-25).

Response: The discussion of LLW management in Chapter 6 of the GEIS focused on the environmental impacts of LLW generated during the extended operation of nuclear power plants (up to 20 additional years). This extended operation effectively sets the time of decommissioning up to 20 years later than anticipated. The requirements for evaluating the environmental impacts of D&D activities are already covered in existing NRC regulations and should not require an additional review as part of the license renewal decision. The analysis in Chapter 7 of the GEIS shows that there is a relatively small additional volume of waste generated during the license

renewal period. On-site storage of LLW during the license renewal term does not significantly increase the environmental impacts resulting from D&D activities.

Concern Nmbr: SWM.038
Topic: Solid Waste Management
Subtopic: LLW storage
Associated Comment Nmbr(s): 087.085 087.093
Concern: The EPA pointed out that the fact that on-site storage of LLW can be managed within occupational and public radiation exposure limits does not mean the impacts are insignificant (see p. 6-21). These impacts should be quantified.

Response: The revised GEIS quantified the environmental impacts of on-site storage of LLW and showed that the significance level is expected to be small for all plants. The analysis has shown that interim storage of LLW from refurbishment activities (even beyond 5 years) poses no unusual or extraordinary risks because of the existence of on-site facilities able to limit occupational and public radiological exposures.

Concern Nmbr: SWM.039
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 087.086
Concern: The EPA disagreed with the GEIS statement that the impacts of LLW disposal are insignificant. It noted that each license applicant for a LLW disposal facility is required to prepare a Safety Analysis Report and an Environmental Report, and that the NRC prepares an EIS for each license; this implies that the issue is not insignificant. These impacts should be quantified, discussed, and explicitly factored into the cost-benefit balance in the GEIS.

Response: The observation on page 6-1 of the draft GEIS was not intended to dismiss the environmental impacts of LLW disposal at off-site facilities. It was meant to imply that the purpose of operating licenses and attendant regulations are to *ensure* that impacts will be minimal. The GEIS does not discuss the impacts upon land use, groundwater, and other environmental factors from these off-site facilities because these impacts are considered during the environmental review of a LLW disposal facility pursuant to 10 CFR Part 61 (Licensing Requirements for Land Disposal of Radioactive Waste). Impacts quantified and discussed in the EIS for the disposal facility are noted in the GEIS. Furthermore, the purpose of a Safety Analysis Report is to demonstrate that the impacts of waste disposal will be minimal once the facility is operating as designed. Finally, a cost-benefit analysis will no longer be perfomed as part of the NRC's NEPA review for license renewal.

Concern Nmbr: SWM.040
Topic: Solid Waste Management
Subtopic: LLW disposal
Associated Comment Nmbr(s): 087.088
Concern: The EPA noted that the use of 100 counts per minute (cpm) above background as a

cutoff criterion for when trash is disposed of as LLW versus transported to a landfill is a de-facto BRC criterion. The NRC has withdrawn the BRC Policy Statement pending a negotiated rulemaking.

Response: The 100 cpm cutoff stated in page 6-13 of the draft GEIS refers to the current practice of sorting LLW by the Robinson plant. This practice is consistent with the NRC's IE Circular No. 81-07, "Control of Radioactive Contaminated Material." This circular gives guidance to operators of nuclear power reactor facilities on the control of radioactive contamination. The objective of the guidance is to "provide reasonable assurance that contaminated materials are properly controlled and disposed of, while at the same time providing a practical method for the uncontrolled release of materials from the restricted area." The guidance establishes "operational detection levels below which the probability of any remaining, undetected contamination is negligible and can be disregarded when considering the practicality of detecting and controlling such potential contamination and the associated negligible radiation doses to the public."

Concern Nmbr: SWM.041
Topic: Solid Waste Management
Subtopic: Mixed waste
Associated Comment Nmbr(s): 087.091
Concern: The EPA recommended that the ability of each site to adequately control mixed wastes onsite should be considered because the extended life cycle of nuclear plants will substantially increase the quantities of mixed wastes.

Response: The extended life cycle of nuclear power plants will mean that there will be an incremental annual addition to mixed waste generation. However, license renewal is not expected to significantly increase the annual volume of mixed waste generation. The analysis in Chapter 6 of the GEIS shows that mixed waste currently accounts for a small fraction (3 percent) of annual volumes and will probably decline in years to come (see Section 6.5.5.6.1). Therefore, the environmental impacts from mixed waste generation are expected to be of small significance for all plants.

Concern Nmbr: SWM.042
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 087.094
Concern: The EPA noted that advocating the use of pool and dry storage methods to temporarily accommodate spent fuel avoids addressing the larger issue of identifying reasonable long-term storage for spent fuel. The NRC should consider focusing on solving the problem of long-term storage before proceeding with license renewal.

Response: The NRC does not have the legal authority for "focusing on solving the long-term storage issue." Under the NWPA, the DOE is responsible for providing for long-term storage of spent fuel and HLW. The NRC's responsibility is to review and license MRS facilities and permanent repositories upon receipt of applications from the DOE.

Concern Nmbr: SWM.043
Topic: Solid Waste Management
Subtopic: LLW disposal-costs
Associated Comment Nmbr(s): 087.119
Concern: The EPA asked about the assumed costs of LLW disposal and whether these assumptions were conservative (see Section 9.4.5.4, p. 9-40 and p. 10-6; also see Section 9.5, p. 9-41).

Response: The license renewal decision standard is based on safety and environmental considerations. Consideration of economic factors on whether to continue operating a nuclear plant will be made by utility, State, and Federal (non-NRC) decision makers. Hence Appendix H of the draft GEIS, which discussed license renewal costs, has been deleted.

Concern Nmbr: SWM.044
Topic: Solid Waste Management
Subtopic: LLW storage
Associated Comment Nmbr(s): 038.040
Concern: The MDNR believes that although Section 6.3.3.3 (p. 6-25) provides a good explanation of storage plan criteria, the final conclusion needs to include this explanation because as it stands the conclusion is too general.

Response: The summary section of Chapter 6 provides the basis for the conclusions drawn.

Concern Nmbr: SWM.045
Topic: Solid Waste Management
Subtopic: Spent fuel
Associated Comment Nmbr(s): 038.041
Concern: The MDNR believes that the discussion in Sections 6.5.1 and 6.5.2 (p. 6-34) are too weak. It believes that DOE reports should be used to estimate the amount of spent fuel for ISFSI or MRS facilities. An estimate of onsite storage could then be made with appropriate assumptions on existence and timing of an MRS and a repository. It implied that this should be done on a per plant basis.

Response: The *Integrated Database for 1993: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics* (DOE/RW-0006) developed by ORNL for DOE was used to obtain the total inventory of spent fuel in the U.S. Chapter 6 of the revised GEIS provides information on the projected storage space for the entire nuclear industry, as well as for the ten sample plants, if the DOE is unable to accept spent fuel in an MRS or for disposal in a geologic repository (see Section 6.5.6.1).

Concern Nmbr: SWM.046
Topic: Solid Waste Management
Subtopic: Transportation
Associated Comment Nmbr(s): 035.016
Concern: The PDER noted that the transportation accident risk analysis in NUREG-0170, Revision 1 is very conservative. The package release models are somewhat unrealistic. Better models with more realistic assumptions should be used in order to avoid any unwarranted concern over increased projected total accident risks. The NRC's proposed changes to the radioactive waste transportation regulations, if approved, will provide additional protection for both workers and the public during both normal and accident transportation conditions.

Response: The commenter is correct that the transportation risk analysis in NUREG-0170, Rev. 1 is conservative and that studies that are more recent and more realistic demonstrate that risk is lower. Nevertheless, a conservative bounding approach is taken in Chapter 6 of the GEIS in addressing the radiological and nonradiological environmental impacts of waste management within the context of the back end of the uranium fuel cycle. The changes to 10 CFR Part 71 that are under consideration do not affect the treatment of transportation in Chapter 6.

Concern Nmbr: SWM.047
Topic: Solid Waste Management
Subtopic: Transportation
Associated Comment Nmbr(s): 011.009 043.004 065.004
Concern: Written comments from the New Jersey Department of Environmental Protection and Energy, the FCSE, and a private citizen who sits on the board of several local planning and action committees identified the following concerns with respect to the transportation issue:

1. New Jersey believes that the increased transportation of radioactive waste resulting from refurbishment and the unknown increase in radioactive waste due to plant aging require more examination.

2. The FCSE argues that a key issue is the safety of the transportation routes for radioactive waste.

3. The private citizen believes that the NRC must allow for the transportation issue to be addressed in relicensing hearings since [waste] shipments pose a significant risk to the public, which uses these same roads. Those closest to the plants also have an increased risk of radiation exposure associated with improper packaging and with accidents involving vehicles and higher volumes of shipments.

Response: The public radiation exposure and other potential environmental impacts of transporting radioactive waste and spent fuel have been addressed in Table S-4 (10 CFR 51.52). The analysis in support of Table S-4 is supplemented with additional information relevant to license renewal, which is discussed in Chapter 6 of the GEIS. The concerns raised by the commenters are addressed in
Chapter 6.

The environmental impacts from the transportation of fuel and waste attributable to license renewal are found to be small when they are within the range of impacts of parameters identified in Table S-4. The estimated radiological effects are within regulatory standards. The nonradiological impacts are those from periodic shipments of fuel and waste by individual trucks or rail cars and thus would result in infrequent and localized minor contributions to traffic density. Programs designed to further reduce risk, which are already in place, provide for adequate mitigation. Recent, ongoing efforts by the DOE to study the impacts of waste transportation in the context of the multi-purpose canister (see 60 FR 45147, August 30, 1995) suggest that there may be unresolved issues regarding the magnitude of cumulative impacts from the use of a single rail line or truck route in the vicinity of the repository to carry all spent fuel from all plants. Accordingly, the NRC declines to reach a Category 1 conclusion on this issue at this time. Table S-4 should continue to be the basis for case-by-case evaluation of transportation impacts of fuel and waste until such time as a detailed analysis of the environmental impacts of transportation to the proposed repository at Yucca Mountain becomes available.

C-15. Topic: Surface Water Quality (SWQ)

Surface Water Quality (SWQ)

Concern Nmbr: SWQ.001
Topic: Surface Water Quality
Subtopic: Water use-refurbishment
Associated Comment Nmbr(s): W03.003 W03.007 038.009
Concern: An EPA and a Florida State representative each expressed concern that the GEIS relied too much on the NPDES permitting process to address surface water issues. The EPA representative felt that while the NPDES process should be taking care of water issues, the NRC might still be eliminating an opportunity for the public to raise their concerns on these issues. The Florida representative felt that the result of the NRC approach was to transfer the burden of a NEPA review for the issues relating to license renewal to the EPA, which will have to perform an EIS for every plant regarding discharge issues in those States where the EPA has responsibility for NPDES permits. Additionally, the specific application of NEPA to the NPDES permitting situation may vary among States.

The MDNR noted that the GEIS relies too heavily on the NPDES permit renewal process to account for impacts discussed in Sections 4.2.3.1.9 to 4.2.3.1.11 of NUREG-1437. It pointed out that with respect to the NPDES permit process, the level of communication between the EPA and delegated States varies and, in at least one region, a tendency exists for delegated States to reissue permits without sufficient review. The MDNR questioned how the NRC was going to ensure that potential aquatic impacts from all nuclear plants will be assessed and dealt with properly, given that there is evidence that the process NRC is relying on is inconsistent or substandard.

Response: The NRC does not solely rely on the NPDES permitting process to address the surface water quality issues. Judgments about the significance of these issues during the license renewal term are based on published information, agency consultation, and information provided by the applicant.

Concern that a State may reissue a permit without sufficient review does not provide a basis for the NRC to review issues which are under the CWA, as the NRC is prohibited from reviewing limitations established under the CWA or to impose limitations of its own.

Concern Nmbr: SWQ.002
Topic: Surface Water Quality
Subtopic: Water use-refurbishment
Associated Comment Nmbr(s): W03.005 031.009 080.002
Concern: A representative of the NYSDEC is concerned that the NRC may have overlooked its legal obligation and the obligations of nuclear plant licensees to comply with Section 401 of the CWA. This concern was reiterated by the NYSEO in its written comments.

Consolidated Edison also commented that the NRC should defer to the CWA NPDES/SPDES program since that program adequately regulates and assesses impacts to fish and shellfish resources associated with power plant heat shock, entrainment, and impingement.

Response: The NRC is aware of, and will be guided by, the provisions of Section 401 of the CWA. Under Section 401, an applicant for a Federal license or discharge permit must obtain a State water quality certification. The affected State must certify that the facility's discharges will comply with State water quality standards. Such certification implies a finding that the residual impacts to the aquatic environment are small.

The CWA requires that the NRC accept the determination of the magnitude of the impacts as made under the CWA and not duplicate reviews done by other Federal or State agencies implementing that Act. For those issues for which decisions have been made, the NRC will interpret the discharge permit as indicating that the agency considers the impact to be small. For those issues for which the discharge permit is still open, the NRC will work with the permitting agency in evaluating the magnitude of the impact. In instances where all determinations have not been made under the CWA, the NRC cannot defer to the NPDES/SPDES program as suggested by the commenter, but the NRC can accept those determinations which have been made as indicative of the magnitude of the environmental impact.

Concern Nmbr: SWQ.003
Topic: Surface Water Quality
Subtopic: Water use-refurbishment
Associated Comment Nmbr(s): W03.006
Concern: An EPA representative was concerned that the original NEPA review only considered the duration of the original license. She recommended that relicensing be treated as an opportunity for a new NEPA review to account for the extended life because EPA does not perform a NEPA review on reissuance of an NPDES permit and the proposed Part 51 revisions are relying on the NPDES permitting process.

Response: The NRC will perform a NEPA review. The GEIS is part of that process. The NRC has reviewed impacts that have been postulated to occur at nuclear power plants and has found the magnitude of the postulated impacts, in most instances, to be small. None of these findings were contingent on the anticipated operating life of the nuclear plant. The GEIS describes extensive effort to identify issues that would weigh heavily in a relicensing decision.

An NPDES permit is issued for a maximum period of 5 years. Aquatic impacts could be reviewed as many as 9 times under the NPDES permitting process before a nuclear plant would begin its 41st year of operation. The NRC is "relying" on the NPDES permitting process only to the extent that it is accepting the issuance of a permit and approval under the CWA as a determination that the magnitude of the residual impacts to the aquatic environment is small. The NRC is not relying on the NPDES permit process for any other aspect of the NEPA review. The EPA made a deliberate determination not to do a NEPA review in conjunction with the NPDES permit reissuance. It is not evident that this decision by the EPA is relevant to the NRC's decision to do a NEPA review. However, as noted above, the NRC intends to conduct a NEPA review.

Concern Nmbr: SWQ.004
Topic: Surface Water Quality
Subtopic: Water use conflicts-categorization
Associated Comment Nmbr(s): W03.010 054.054 087.021
Concern: The EPA commented that this issue should be Category 3 because water use issues are not generic in nature and will have to be dealt with at each plant. The EPA pointed out that without proper oversight, utilities may ignore and/or mitigate rather than avoid secondary and cumulative impacts to natural resource areas outside the plant boundaries. Also, the current drought conditions across the Midwest and West increase the likelihood that water use conflicts will increase. Projected human use and preservation of aquatic habitat, riparian habitat and associated biota will compete with power plants for water supply. Although water use or water rights should be resolved with the appropriate State or Federal agencies, it should not be settled independently, but should be done as part of the relicensing process to ensure an adequate water supply and equitable water use during the license renewal period. Instream water uses may not be well represented in decision making bodies that resolve water use conflicts.

The State of Minnesota commented that while issues related to water appropriations are reviewed and resolved through the State's water appropriation permit authorities, it does not favor a nationwide generic analysis approach for relicensing, particularly as it applies to water use and water resource impacts. The agency argues that unique regional hydrologic, geologic, and biologic conditions warrant individual environmental review for each facility or a statewide generic analysis for Minnesota facilities.

A representative from ADEQ indicated, at the workshop, that water use conflicts are a serious issue for nuclear power plants in Arizona, and water use should be a Category 2 issue so that the issue does not get overlooked at plants where this is a specific problem.

Response: The concerns over water use conflicts focus on the equitable allocation of scarce water resources. The comments are stimulated by recognition that water allocation will become more difficult and more controversial in the future. There is an implication that water allocation decisions may preclude a nuclear power plant from operating beyond the term of the original license. It should not be inferred from the comment that water allocation is the NRC's responsibility under the NEPA process. Moreover, it should not be inferred that, once an allocation decision is made, the NRC should reexamine the allocation issue under NEPA.

The GEIS analysis includes that nuclear power plants using once-through cooling systems are located near large bodies of water. Potential water use conflicts are expected to be small because the water consumption by these plants is negligible compared to the size of the body of water that is the source of the cooling water supply. Hence, this issue remains Category 1. On the other hand, the GEIS now concludes that the issue of water use for nuclear power plants using cooling towers and cooling ponds is Category 2 and will require a site-specific review (see Sections 4.3.2.1 and 4.4.2.1 of revised GEIS). For plants with closed-cycle cooling systems, water use conflicts may be of small or moderate significance during the license renewal period. Similarly, for plants with cooling systems that utilize cooling ponds, water use conflicts may also be of small or moderate significance.

Concern Nmbr: SWQ.005
Topic: Surface Water Quality
Subtopic: Water use-refurbishment
Associated Comment Nmbr(s): W03.008 W03.015 080.003
Concern: Consolidated Edison and representatives of United Engineers and Constructors (UEC) disagreed with the NRC position that plant relicensing should be linked to the reissuance or review of the NPDES permit or 316(a) and (b) determinations. Consolidated Edison noted that it is not predictive of the plant's status at the end of the initial license period, and should not affect how cooling water intake and thermal discharge issues are addressed by the NRC. The UEC and Consolidated Edison representatives observed that since there is already in place a 5-year revisitation cycle for the permits, along with a reopener clause to reexamine the issues at almost any point in time, there will be at least 2 or 3 visitations of these issues by the permitting authority prior to the expiration of the initial licensing term. Therefore, they felt that it is arbitrary to categorize plants based upon facts as they exist in the 22nd to 25th years of operation and make inferences as to what will pertain in the 40th year. Additionally, the Consolidated Edison representative indicated that the NRC approach appears to be inconsistent with the methodology used to address radiological issues, wherein the plant is assumed to be in compliance with the NRC's licensing basis at the end of the 40th year of operation, and the issues addressed only reflect the impacts from the 41st year and beyond. Finally, the Consolidated Edison representative stated that the NRC will be unable to infer that a plant with open 316(a) and (b) issues at the time of a license renewal application will be similarly situated at the end of the 40-year initial license.

Response: The NRC must consider impact to the aquatic environment as part of its impact assessment. Where all determinations required under the CWA have been made, the NRC can conclude that responsible agencies have found the aquatic impacts to be small. However, where determinations have not been finalized, the NRC must make its own determination on the magnitude of the impact. The NRC may work with the responsible agency in doing so. The NRC cannot complete its weighing and balancing of impacts if any potentially significant impacts are not addressed.

The NEPA review will consider the impacts of refurbishment and the impacts of operation during the license renewal period. In making the decision to relicense, the NRC will not consider the impacts during the remaining period of the existing license.

Concern Nmbr: SWQ.006
Topic: Surface Water Quality
Subtopic: Water use-refurbishment
Associated Comment Nmbr(s): W03.016
Concern: A Consolidated Edison representative indicated that the GEIS discussion of the distinction between the NPDES permit and the 316(b) demonstration and determination is obsolete. He indicated that the 316(b) determination is a term that is no longer found in 40 CFR—Sub-part (I) relating to intake structure criteria was rescinded as a result of the 1974 court decision in *Appalachian Power vs. Train*. NRC should focus entirely on the NPDES permit status which subsumes the 316(b) issue.

Response: The court decision resulted in the recision of the regulations for implementing Section 316(b) of the CWA. However the statutory requirement remains that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. If the adequacy of the intake structure with respect to Section 316(b) of the CWA is one of the unresolved NPDES permit issues facing an applicant for license renewal, then the NRC will have to address the potential environmental impact in its NEPA review.

Concern Nmbr: SWQ.007
Topic: Surface Water Quality
Subtopic: Thermal stratification
Associated Comment Nmbr(s): 087.017 087.022
Concern: The EPA stated that "altered thermal stratification (ATS) of lakes" should be a Category 2 issue to be reviewed on a site-specific basis for once-through facilities that discharge water to lakes. The EPA also asked that information on, and discussions of, ATS in rivers, and the availability of makeup water for cooling towers, be provided in the GEIS.

Response: Refurbishment and continued plant operation will not change the occurrence of stratification in the waterbody receiving heated effluent. The draft GEIS identified two power plants (Oconee and McGuire) that have had noticeable effects on stratification. At the Oconee site, studies are being conducted in conjunction with the NPDES permitting agency to ensure that receiving waters are adequately protected. The McGuire plant has also conducted considerable modeling in order to resolve this issue for the NPDES permit. At these two sites the impact of the heated discharges have been found acceptable. Should changes in water quality criteria warrant it at other sites, corrective action under the CWA need not wait until license renewal. The NRC does not anticipate that refurbishment or continued operation will cause any increase in thermal inputs to receiving waters. Therefore, this issue remains Category 1.

With regard to thermal stratification in rivers, because of turbulence, rivers do not naturally thermally stratify. As a result, alteration of temperature stratification in rivers by nuclear power plant discharges would not be an issue. The text of Section 4.2.1.2.3 has been modified to clarify this.

Water availability (use) for power plant cooling towers is addressed in Section 4.3.2.1.

Concern Nmbr: SWQ.008
Topic: Surface Water Quality
Subtopic: Chemical effects
Associated Comment Nmbr(s): 087.019
Concern: The EPA is currently studying more appropriate control mechanisms to address the in-stream acute and chronic toxicity of biofouling compound discharges. The EPA commented that the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) data for biocides commonly address only human toxic reactions, and testing is related to only the "active ingredient". Such datasets fail to provide necessary information on aquatic toxicity or whole product formulation (as

used) toxicity. As each facility's discharge characteristics and the receiving water ecology are unique, these impacts should be reclassified as Category 3.

Response: The NPDES permit for a facility establishes allowable discharges, including biocides. Development of limitations in the NPDES permit takes into account unique qualities of both the facility's discharge and receiving waters. Section 306 of the CWA requires national standards of performance for steam electric power plants. Section 307 of the CWA requires that toxic effluent standards be established and revised from time to time. Limits for biocides are included in the published performance standards in 40 CFR Part 423. Appendix A of that part includes a substantial list of biocides currently controlled by effluent limitations. Issuance of an NPDES permit to allow discharge of biocides imposes effluent limitations to assure that such discharges will not interfere with the attainment or maintenance of water quality and to assure protection of public health, public water supplies, agricultural and industrial uses, recreational uses, and the protection and propagation of a balanced population of shellfish, fish, and wildlife. It is the NRC's expectation that any use of biocides by licensees will be consistent with the NPDES and other Federal and State regulations. The NRC is not aware of any difficulty the industry is having in meeting the effluent limitations for biocides or of any incidents involving repeated discharge of toxins at an operating nuclear plant. None of the regulatory or natural resource agencies consulted for the GEIS expressed a concern about present uses of biocides at nuclear power plants. Because this impact is specifically addressed under the CWA and because the NRC does not have any indication that residual environmental impacts occur in spite of this regulation, this issue remains Category 1.

Concern Nmbr: SWQ.009
Topic: Surface Water Quality
Subtopic: Scouring
Associated Comment Nmbr(s): 087.018
Concern: The EPA commented that scouring due to discharged cooling water has been found to be a possible problem at plants with once-through cooling systems (e.g., San Onofre Nuclear Generating Station). Scoured sediments have resulted in increased turbidity, decreased light penetration, and increased flow of particulates near the bottom, which have impacted wildlife and habitat.

Response: Impacts of scouring by cooling water discharges have been localized and often short-term (i.e., fine sediments are scoured from the immediate discharge area following initial operation, and the substrate is then stabilized as coarser material). Generally, the affected area is small compared to the water body. At the one site (San Onofre) for which potentially adverse biological effects have been reported, resolution of the issue is being pursued by resource authorities within the California Coastal Zone Commission and the California State Water Control Board. No change in the text or category is needed.

Concern Nmbr: SWQ.010
Topic: Surface Water Quality
Subtopic: Salinity gradients
Associated Comment Nmbr(s): 087.016
Concern: The EPA believes that salinity gradients should be considered a Category 2 issue since the impact on salinity gradients and mitigation by plants with once-through cooling systems, specifically the Oyster Creek Nuclear Generating Station, may require reevaluation during the relicensing process.

Response: As noted in GEIS Section 4.2.1.2.2, significant alterations in salinity gradients have been detected only at the Oyster Creek plant. At this site, the impacts were studied extensively, and it was concluded that the water quality and biological effects due to the altered salinity gradients do not extend beyond the two creeks. Agency concerns (NMFS; FWS; and New Jersey Department of Environmental Protection) about the Oyster Creek plant were limited to entrainment, impingement, and thermal effects. The State of Maryland considers altered salinity regimes in its NPDES permitting, but has not detected any significant adverse effects on salinity gradients at the Calvert Cliffs plant (see Section 4.2.1.2.2). No change in the text or category is needed.

Concern Nmbr: SWQ.011
Topic: Surface Water Quality
Subtopic: Uranium fuel cycle
Associated Comment Nmbr(s): 087.082
Concern: The EPA believes that the GEIS should contain a more detailed justification in the consideration of surface water and aquatic ecology impacts from extension of the fuel cycle life resulting from relicensing. Additional fuel mining, milling, separation, enrichment, and processing will all have quantifiable negative impacts on the surface waters of the U.S.

Response: The impacts of the fuel cycle are found in 10 CFR 51.51, Table S-3, "Table of Uranium Fuel Cycle Environmental Data." The tabulated values are normalized for the impact to provide fuel for one year of operation at 1,000 MWe. The table is not dependent on the operating life of the fueled reactor; therefore it does not need revision because the operating life of some facilities will be extended. However, the NRC recognizes that events after the table was published have invalidated some of the entries. Table S-3 is currently undergoing revision as part of a separate rulemaking process. The planned revisions to Table S-3 have been considered in the GEIS despite the present incomplete status of the S-3 rulemaking.

Concern Nmbr: SWQ.012
Topic: Surface Water Quality
Subtopic: Cooling water systems
Associated Comment Nmbr(s): 054.061
Concern: The State of Minnesota pointed out that zebra mussels can block water intake systems. The imminent threat of zebra mussel infestation will likely require significant operational changes at the Prairie Island plant. Therefore, the potential water quality impacts and cooling system modifications need to be evaluated.

Response: The issue of stimulation of nuisance organisms by operation of existing nuclear power plants is judged to be a Category 1 issue because licensees have adopted effective measures to control nuisance species. Chlorine and other biocides have been used to control fouling organisms, such as zebra mussels. However, regulatory concern about the toxic effects of chlorine and other biocides has led plants to eliminate or reduce their use. These refinements in plant practices, as well as the process for modifying the NPDES permit conditions, as needed, support the finding that the effects of chlorine and other biocides on surface water quality are of small significance.

Concern Nmbr: SWQ.013
Topic: Surface Water Quality
Subtopic: Categorization of issues
Associated Comment Nmbr(s): 063.018
Concern: NUMARC commented that the issue of Effects of Refurbishment on Surface Water Quality should be changed from Category 2 to Category 1. The reason for the Category 2 finding appears to be a concern that licensees will not implement BMPs for the control of runoff to nearby surface water.

Response: The effects of refurbishment on surface water quality is now a Category 1 issue (see Section 3.4.1 of the revised GEIS). Proven erosion control measures and other BMPs are expected to be implemented at all plants and will minimize impacts to local water quality from runoff in disturbed areas. Hence, the impacts of refurbishment activities on surface water quality are expected to be of small significance at all plants.

Concern Nmbr: SWQ.014
Topic: Surface Water Quality
Subtopic: Water use
Associated Comment Nmbr(s): 038.023
Concern: With regard to the water use requirement for the fuel cycle, discussed in Section 4.8.2, the MDNR pointed out that the water use estimates for a plant using once-through cooling appear lower than expected, based on today's technology.

Response: The Table S-3 rulemaking assumed that power for existing uranium enrichment facilities was being provided by coal-fired steam-electric power plants at a rate of 45 MWe per 1,000 MWe nuclear facility. The work was reported in 1974 in WASH-1748. As the commenter noted, if the enrichment facilities were powered from an electrical generating facility built today, different water use figures might be obtained.

C-16. Topic: Terrestrial Ecology (TEL)

Terrestrial Ecology and Land Use (TEL)

Concern Nmbr: TEL.001
Topic: Terrestrial Ecology and Land Use
Subtopic: Threatened & endangered species
Associated Comment Nmbr(s): W03.002 W06.001 W06.006 055.007
Concern: The YAEC and representatives from Virginia Power, American Electric Power, and Halliburton NUS recommended changing the threatened or endangered species issue from Category 3 to Category 2 with the bounding criteria being whether threatened or endangered species are present at a given plant or whether there are expected impacts to them during refurbishment or extended plant operation.

Response: A determination of whether relicensing has the potential to impact a protected species must be made for each site. In order to make such a determination, a site-specific review must be conducted. If no species or habitat is present, then the site-specific review need go no further. However, the determination must be valid at the time of the relicensing decision. The argument that "no impact" will be easy to demonstrate for most sites is not relevant as to whether a site-specific review is required. Based on the redefinition of the issue categories, this issue is now Category 2. A site-specific review will be done for each site at the time of relicensing.

Concern Nmbr: TEL.002
Topic: Terrestrial Ecology and Land Use
Subtopic: Threatened & endangered species
Associated Comment Nmbr(s): W06.007
Concern: A representative of Halliburton NUS requested clarification on the plant's responsibility for a threatened or endangered species which might be within its range. Specifically, the NRC should clarify whether a plant that was required to prepare a biological assessment on a threatened or endangered species is required to report to the FWS on this species every 10 years.

Response: Both the NRC and licensees have certain duties under the ESA. Licensees must comply with the general provisions in Section 9 of the Act (16 USC Section 1538). The NRC must comply with the consultation provisions of Section 7 (16 USC Section 1536). In addition, the NRC has imposed reporting requirements to ensure that compliance with the Act is achieved. These reporting requirements are likely to differ for each plant assessment.

Concern Nmbr: TEL.003
Topic: Terrestrial Ecology and Land Use
Subtopic: Threatened & endangered species
Associated Comment Nmbr(s): W06.009 W06.010 W06.011 W12.040 056.012
Concern: An EPA representative suggested that the endangered species provisions in the GEIS include proposed species in addition to already threatened and endangered species since the ESA requires them to confer over candidate species, i.e., those species that have been proposed for listing. Moreover, representatives from the NYSDEC, Virginia Power, and American Electric

Power pointed out that the GEIS does not consistently mention both State and Federal threatened or endangered species lists, or consultation on threatened or endangered species at the State and Federal levels. Finally, the DOI recommends that the rule require consultation with the DOI and other appropriate agencies for each plant having "important terrestrial resources" in the project area, and that the list of resources include migratory birds and avian species of concern on State, regional, and national levels.

Response: Appropriate sections in the GEIS have been revised to state explicitly that species listed or proposed to be listed as threatened or endangered by the FWS will be considered in the NRC's NEPA review of individual license renewal applications. State-listed threatened and endangered species will be afforded the same consideration. However, candidate species, which are just being proposed for listing by the FWS, will not be considered in the NEPA review. Candidate species do not have protected status; neither the ESA nor any other Federal regulation requires that they be considered.

The impacts of refurbishment activities and normal operations during the license renewal term on threatened and endangered species are designated as Category 2 issues. The NRC will address these issues in the site-specific NEPA review.

Concern Nmbr: TEL.004
Topic: Terrestrial Ecology and Land Use
Subtopic: Bird collisions-cooling towers/power lines
Associated Comment Nmbr(s): W06.012 056.005 087.042 087.044
Concern: The EPA and the DOI commented that loss of birds due to impaction with cooling towers and transmission lines should be considered for each site at the time of renewal. The EPA commented that illumination of cooling towers should be considered in the relicensing process to reduce avian mortality. Therefore, bird collisions should be considered a Category 2 issue to provide mitigation at those plants with cooling towers that do not have illumination (see Section 4.3.5.2, pp. 4-38; 10-17). The issue of bird collisions with power lines should also be considered as a Category 2 issue for power-plant associated transmission lines that cross wetlands used by large concentrations of birds or that transect major flyways. Mitigative measures for these lines should be considered as part of the relicensing process (e.g., orange aviation balls and spiral vibration dampers) (see Section 4.5.6.2, pp. 4-63; 10-18).

Similarly, the DOI stated that the GEIS Category 1 conclusion regarding bird collisions with cooling towers and power lines is unsupported, based as it is "on a limited analysis that lacks ecological interpretation and statistical precision."

Response: The GEIS cites several studies which conclude that bird mortalities resulting from collision with transmission lines, towers, or cooling towers are not significantly impacting bird populations. The NRC's review of studies by licensees and the survey of natural resource agencies identified only the Prairie Island plant as having a relatively high incident rate of bird mortalities along transmission lines. Neither the NRC's review of studies by licensees nor the survey of natural resource agencies identified any specific significant incidents of bird mortalities. Furthermore, the comments on the draft GEIS did not reference additional information that should

be analyzed. Data on bird collision mortality were found for 6 of 20 nuclear plants with natural-draft cooling towers. These data, along with the literature reporting total collision mortality show the following: (1) bird mortality associated with cooling towers represents a very small portion of the total collision mortality; and (2) local bird populations are not being reduced significantly. Thus, this issue remains Category 1.

Concern Nmbr: TEL.005
Topic: Terrestrial Ecology and Land Use
Subtopic: Bird collisions-cooling towers/power lines
Associated Comment Nmbr(s): W06.013 W06.014
Concern: EPA and DOI representatives had two specific questions about the data for bird mortality at power lines and cooling towers: (1) whether the data was from all plants or a representative sample of plants, and (2) whether the data on bird mortality at power lines was from an entire power line or just a specific section of the line from the plant.

Response: The NRC made no attempt to be selective in reviewing collision data. All available bird collision data were reviewed, including data for power lines and cooling towers associated with all types of generating facilities. Data do not exist for all nuclear plants. Studies of bird mortality along power lines are generally initiated only at specific power-line sections where collisions appear to be or are expected to be relatively frequent compared to other lines or sections of the lines. Nevertheless, the entire power line is generally considered in the selection of specific study sites. EISs prepared by the NRC for the initial construction and operation of nuclear plants considered the environmental impacts of the entire length of power lines associated with these plants and did not consider only certain sections of the lines.

Concern Nmbr: TEL.006
Topic: Terrestrial Ecology and Land Use
Subtopic: Bird collisions-cooling towers/power lines
Associated Comment Nmbr(s): W06.008
Concern: Given dwindling land and wildlife resources, California is considering the need to evaluate how existing facilities should be operated in the future. Literature reviews may not suffice for identifying threatened or endangered species issues, such as bird collisions with transmission lines, due to spotty data and no ongoing monitoring to yield data. Monitoring programs need to identify impacts for consideration in future relicensing. In addition, the documentation a facility provides for relicensing needs to consider not only the facility's refurbishment, but also continued operations since that would affect the environment as well.

Response: The draft GEIS addressed the impacts of refurbishment activities and nomal operations during the license renewal tem on bird collisions with transmission lines. The NRC believes that power company data and numerous studies of avian mortality from collisions with transmission lines and other man-made objects that have been published provide sufficient basis for the GEIS analysis. In addition, monitoring data on bird collisions with transmission lines were also obtained for one nuclear power plant, the Prairie Island plant in Minnesota. Overall, relatively little concern about bird collision mortality has been expressed in the literature.

Furthermore, no study reviewed for the GEIS has suggested that collision mortality is a significant factor in reducing the population of common bird species.

Concern Nmbr: TEL.007
Topic: Terrestrial Ecology and Land Use
Subtopic: Habitat loss and biodiversity
Associated Comment Nmbr(s): W06.003
Concern: An EPA representative pointed out that the EPA places high priority on the issue of ecology and terrestrial environment, and is in the process of evaluating how to approach habitat loss and biodiversity since the EPA has no direct regulatory authority in these areas except through NEPA and Section 309 of the CAA. In addition, the DOI is developing a Congressionally-mandated database in these areas. An aspect of license renewal that may have some impact on biodiversity is the impact on the influx of species as a result of cutting the power lines.

Response: Habitat loss and biodiversity may be potentially useful tools for understanding environmental impacts. Biodiversity refers generally to the overall variety of biological habitats and species in a given region. However, there are no standards for expressing diversity or for an acceptable or optimum level of biodiversity. The EPA's developmental work in this area may lead to improved NEPA decision making.

Biodiversity could be impacted by habitat changes associated with refurbishment and continued operation, by the continued occupation of former habitat by power plant facilities, and by the continued control of vegetation in power-line corridors. Only a small habitat loss, e.g., no more than 4 hectares (10 acres) (Section 3.6 of revised GEIS), would result from the relicensing and refurbishment of any nuclear plant. Therefore, regional biodiversity would not be significantly affected by refurbishment. Also, no significant habitat change would result from continued operation, and biodiversity would not be significantly impacted.

The presence of power-plant and power-line corridors would continue to influence biodiversity. The initial construction and the long-term presence of power plants may have either increased or reduced biodiversity. Construction may have had a negative impact on biodiversity locally where a relatively scarce habitat type was lost and precluded over the long term. The construction of power-line corridors required the clearing of forests in many areas and continued vegetation control. Thus, low-growing vegetation has replaced forest in many areas. This permanent change in habitat would continue to influence wildlife as discussed in Section 4.5.6 and would continue to influence biodiversity. In some instances this is an increase in biodiversity, in others, a decrease. However, no generally accepted determination of optimum biodiversity has been made by the scientific or political community. Therefore, it is not feasible for this GEIS to provide an assessment of whether the continued utilization and maintenance of power-line corridors would have a significant negative or positive impact on biodiversity.

The NRC believes that the impact to wildlife is evaluated adequately using the tools available.

Concern Nmbr: TEL.008
Topic: Terrestrial Ecology and Land Use
Subtopic: Transmission lines
Associated Comment Nmbr(s): W12.041 075.012 087.009
Concern: The EPA noted that the GEIS appears to assume that there will not be new transmission line construction in existing or new corridors. If this assumption is correct, it should be stated as a condition for the generic conclusions reached regarding impacts associated with transmission lines.

The PSCW expressed concern that the discussion on transmission lines on pages 3–4 of the GEIS indicates that no offsite power line modifications are expected as part of relicensing. It pointed out that most transmission lines on wooden poles need rebuilding when the poles have been in use for 50–60 years.

Response: Maintenance is perfomed on transmission systems, including lines, throughout their service life. Maintenance may include replacement of towers supporting transmission lines, for example, as necessitated by deterioration, an accident, storm damage, or vandalism. Maintenance of the lines, including the replacement of towers, would not have been considered "modifications." The NRC recognized the potential impact of maintenance activities in its initial license review for many facilities and did not identify any impacts not encompassed in the review. Maintenance of the lines during the license renewal period is considered in the GEIS. A statement has been added to the text that rebuilding of wooden pole structures may be necessary about every 50 to 60 years (See Section 3.1).

The NRC notes that its interest in transmission lines historically has not extended beyond the first connection to the electrical transmission grid. Construction of new connections to the transmission line grid are not expected to occur in conjunction with license renewal. If new lines are proposed, the NRC will assess the impacts of the lines in accordance with NEPA requirements. The GEIS has been revised accordingly (see Section 3.6).

Concern Nmbr: TEL.009
Topic: Terrestrial Ecology and Land Use
Subtopic: Onsite land use
Associated Comment Nmbr(s): W06.004 054.058
Concern: The MDNR commented that the GEIS does not encompass the impact of on-site spent fuel storage on land use and, therefore, the land use issue Category 1 ranking should be reviewed. The NRC should recognize that without a HLW repository or a MRS facility, relicensing will trigger the need for additional on-site storage for spent fuel and the subsequent acquisition of State and local permits for land clearing or wetlands kinds of impacts. The following two specific points should be considered:

1. Additional on-site storage for spent fuel, for example, may fall under "the umbrella of refurbishment," a Category 2 issue, or it may be an onsite land use issue, a Category 1 issue. Additional on-site storage could destroy habitats of threatened or endangered species, a Category 3 issue.

2. The land use issue Category 1 ranking may be inappropriate since it does not set bounds for plants. For instance, the spent fuel facility proposed by Calvert Cliffs is well removed from the power block. It would have greater land use impact than the spent fuel facility at Oconee, which is essentially right in the power block. The GEIS does not require examination of additional onsite storage, e.g., spent fuel, unless a particularly important habitat is present.

The State of Minnesota indicated that the relicensing of the Monticello and PI nuclear plants must include a thorough analysis of all future system requirements, including a proposed transmission line crossing of the Mississippi River, a new access road to PI, dry cask storage of spent fuel, and a radio transmitter tower at Prairie Island.

Response: The NRC agrees that waste management operations could require construction of additional storage facilities on site. This situation was considered in the analysis of the impacts on land use of refurbishment and normal operations during the license renewal term, and is acknowledged in the appropriate section of the GEIS (see Sections 3.2, 3.6, and 6.5). Experience has shown that land requirements for waste storage facilities would be relatively small (less than 9 acres). Hence, the GEIS concludes that the impacts on land use are expected to be of small significance for all plants (i.e., Category 1).

Concern Nmbr: TEL.010
Topic: Terrestrial Ecology and Land Use
Subtopic: Habitat restoration programs
Associated Comment Nmbr(s): 056.013
Concern: The DOI pointed out that they, as well as various State agencies, are currently working on anadromous fish and waterfowl habitat restoration programs which include areas and river systems near nuclear plants. These alterations are covered by a NPDES permit; however, they must also be identified and discussed in plant license renewal to determine whether changes in facility operations or structures for individual power plants may now be necessary.

Response: To the extent that review of the license renewal application is necessitated by proposed refurbishment activities and by proposed changes in operation during the renewal period, the review will address impacts on known restoration programs.

Concern Nmbr: TEL.011
Topic: Terrestrial Ecology and Land Use
Subtopic: Herbicides and pesticides
Associated Comment Nmbr(s): 056.006
Concern: The DOI disagrees with the GEIS assumption that herbicides, when properly applied, generally are not toxic to wildlife and pointed out the following: (1) herbicide toxicity has only been tested on a few wildlife species; (2) most laboratory tests are on active ingredients rather than formulated products and the constituents in formulated products may enhance the toxicity of a pesticide; (3) the common laboratory endpoints do not fully elucidate the effects of pesticides under actual exposure conditions, and other concerns, including sublethal effects need to be considered; (4) environmental effects of herbicides are not limited to terrestrial wildlife;

(5) non-target plants, including endangered species, can be adversely affected by ROW management, including herbicide use; (6) fish and wildlife species can be directly harmed from ROW maintenance when food or habitat are destroyed or altered; and (7) some pesticides used for ROW maintenance have significant environmental concerns associated with them, such as persistence and groundwater contamination. The agency also disagrees with the GEIS conclusions on page 4-61, lines 37–39. The DOI is very concerned about the effect of pesticides on fish and wildlife, but the GEIS states that the toxic effects on wildlife are generally of little concern to wildlife biologists or wildlife managers..

Response: In raising the seven points regarding the application of herbicides registered under the FIFRA, the DOI is questioning the effectiveness of the registration program without identifying any specific examples of impacts associated with maintenance-line ROW, or without offering an alternative for establishing the impact to be expected from continued use of registered herbicides. Without challenging the validity of any of the limitations of the registration program that the DOI identified, the NRC believes that registration has been generally effective in limiting the impacts resulting from herbicide use. The comment was made out of context and does not reflect the extensive GEIS assessment of the potential impact of herbicides on wildlife populations. Whereas some individual animals may be adversely affected by herbicides and vegetation changes from herbicide application, populations are not significantly impacted by toxic effects or by herbicide effects on vegetation. The GEIS statement that toxic effects of herbicides on wildlife are generally of little concern to wildlife biologists or wildlife managers was based on an extensive review of the literature; this literature indicates that the statement is true. The DOI did not provide any reference to additional information that should be analyzed.

Concern Nmbr: TEL.012
Topic: Terrestrial Ecology and Land Use
Subtopic: Offsite land use
Associated Comment Nmbr(s): 079.014 079.030
Concern: The State of Vermont commented that Section 4.8.1 of the GEIS regarding the common classes of land use does not adequately consider the permanent commitment of land for radioactive waste disposal as compared with other options. The permanence of land committed for radioactive disposal deserves a separate categorization, different from other "permanent land uses" (which can eventually be reclaimed with effort or after an amount of time). This separate characterization would make it clear that a small amount of land used for radioactive waste disposal may be significantly less preferable than a larger amount of land disturbed by local strip mining, which can be reclaimed if desired. In addition, while the Table S-3 evaluation and the GEIS attempt to compare nuclear power land uses to coal cycle land uses, the adverse land use effect of radioactive waste disposal is much more pronounced than for the coal cycle. Vermont indicated that by attempting to use Table S-3 conclusions, the GEIS evaluation significantly obscures the land use environmental impact and cannot be considered adequate.

Vermont also noted that the assessment of commitment of resources in Section 10.2 is inadequate for the purposes of NEPA. Since additional land will be required for HLW and LLW disposal, the section must (1) assess the likelihood that such resources are available, and (2) evaluate the aspect that such land (if available) will be removed from social usefulness essentially forever.

Vermont believes that the permanency of this impact must be weighed heavily when compared to more short-term impacts.

Response: In Table S-3, "permanently-committed" land represents land that may not be released for use after plant shutdown, decommissioning, or waste burial. If it is deemed necessary to reverse the "permanence" of land use, the land can be reclaimed. The comparison of nuclear fuel cycle land uses with coal plant land uses does not extend to permanently-committed land. Note also that in the final GEIS, the discussion of the impacts of the uranium fuel cycle is integrated more closely with the discussion of the impacts of waste management. Thus, Section 4.8 in the draft GEIS in now part of Chapter 6.

Concern Nmbr: TEL.013
Topic: Terrestrial Ecology and Land Use
Subtopic: Cooling towers
Associated Comment Nmbr(s): 087.040
Concern: The EPA noted that both mechanical and natural draft cooling towers have been shown to cause increased salt deposition within approximately two kilometers of the tower. While the salt drift has been shown to have little impact on offsite crops, the effects of other biocides (e.g., chromium) have not been fully investigated. If, as part of refurbishment, a change in cooling tower biocides is proposed, it may be necessary to perfomm a site-specific evaluation. Therefore, the cooling tower impact on crops should be considered a Category 2 issue (see Section 4.3.4, pp. 4-27; 10-17).

In addition, cooling towers, particularly mechanical draft cooling towers, have been shown to result in increased heavy metal deposition (chromium and zinc) and vegetative damage, possibly from sulfate emissions. The source of these substances appears to be biocides added to the cooling water. As changes in biocides may be a factor in refurbishment, cooling tower impacts on native plants should be considered a Category 2 issue (see Section 4.3.5.1, pp. 4-35; 10-17).

Response: The study by Taylor, cited on pages 4-31 and 4-32 of the draft GEIS examined chromium behavior associated with cooling towers that need a chromate/zinc phosphate corrosion inhibitor at a concentration of 20 ppm (as CrO_4^{-2}) in the recirculating water. These towers were not at nuclear power plants, and because no nuclear power plant uses chromium or zinc compounds as a biocide in their condenser cooling water systems, discussion of the study by Taylor has been deleted from the GEIS. Because of concern over the potential toxicity of cooling tower blowdown on aquatic life, these chemicals are included in the list of priority pollutants. Effluent limitation guidelines in 40 CFR Part 423, "Steam Electric Power Generating Point Source Category," limits the concentration of total chromium in cooling tower discharge to 0.2 mg/l. Zinc is limited to a concentration of 1.0 mg/l. The regulations (see Appendix A to 40 CFR Part 423) list 124 other priority pollutants contained in chemicals added for cooling tower maintenance. The concentration of these 124 chemicals must be undetectable. Any proposed changes in cooling tower biocides would be subject to approval through the regulation of toxics and biocides, and through other regulations focusing on water quality. The NRC does not expect that biocides used in cooling towers will result in significant drift deposition rates or damage to agricultural crops, orchards, other cultivated plants, or native plants. Moreover, vegetation damage observed at nuclear power plants with mechanical draft cooling towers is minor and

localized in small areas. The elevated rates of sulfate deposition from the Palisades cooling tower resulted from the addition of sulfuric acid to the cooling water. Use of sulfuric acid has been discontinued, thus, significantly reducing the impact. Hence, the impacts of nuclear power plants using cooling towers on agriculture and vegetation are expected to be of small significance and are considered Category 1.

Concern Nmbr: TEL.014
Topic: Terrestrial Ecology and Land Use
Subtopic: Cooling towers
Associated Comment Nmbr(s): 087.041
Concern: The EPA noted that the impact of icing on native plants at the Palisades Nuclear Plant is not adequately explained to determine if it was a one-time incident. Therefore, cooling tower impacts on native plants possibly should be reconsidered to include potential mitigation at Palisades.

Response: As discussed in Section 4.3.5.1 of the draft GEIS, significant impacts of icing and sulfates associated with cooling tower operation at the Palisades plant in 1975 occurred in an area of 8 ha, including about 6 ha of forest. This area was entirely within the plant site. Vegetation damage resulted primarily from sulfate deposition due to the addition of sulfuric acid to the cooling water. The use of sulfuric acid was discontinued, thus eliminating this potential impact. The severe icing in 1975 may have resulted from unusual weather conditions combined with a possible cooling tower malfunction. The nature of the unique circumstances contributing to the damage of trees by ice formation at Palisades was such that icing damage is not expected to recur frequently. No significant icing damage has occurred in the 20 years since this first occurrence. Therefore, no mitigative actions are warranted. However, the reason why the impact is not significant is that damage was limited to a small area within the site in the immediate vicinity of the cooling towers.

The experience gained from this incident and the successful corrective action make the occurrence of a similar impact during a license renewal term unlikely. Monitoring results have been consistent among plants with cooling towers, supporting the generic Category 1 conclusion for this issue. (Also see response to 087.040 under Concern TEL.013.)

Concern Nmbr: TEL.015
Topic: Terrestrial Ecology and Land Use
Subtopic: Power lines
Associated Comment Nmbr(s): 056.007 087.043 087.045
Concern: The EPA commented that the impact of power line ROW on floodplains and wetlands should be considered a Category 2 issue to ensure that two stipulations are included in the license renewal: (1) if new line construction occurs, it should avoid bogs because of their extremely slow recovery; and (2) line maintenance in wetlands should occur in winter, whenever possible, to minimize damage to vegetation. It is essential that the proposed rule clarify what is meant by "standard practices" at this stage. This is critical for disclosure purposes, so that there is adequate opportunity for review of those "standard practices" (see Section 4.5.7, pp. 4-70; 10-18). The NRC should refer to the CWA Section 404 (b)(1) guidelines and the U.S. Army Corps of

Engineers Regulatory Guidance Letter dated July 18, 1990. Impacts to wetlands should first be avoided, then minimized, then mitigated where avoidance and minimization are not feasible.

In addition, the EPA commented that the issue of the impact of power line ROW management on wildlife should be considered a Category 2 issue to ensure that two stipulations are included in the license renewal: (1) only herbicides approved for ROW use by the EPA are employed; and (2) application is done exclusively by a licensed operator. These conditions are not presented in the GEIS as current requirements (see Section 4.5.6.1, pp. 4-60; 10-17).

Similarly, the DOI disagrees with the GEIS assumption that the impacts of transmission lines ROW management to wildlife require no further consideration. While the actual effects of transmission line corridors on avian reproduction and populations are difficult to document, they may be important on site-specific and cumulative bases. The DOI argues that the NRC based its conclusions on several general references. It believes the issue should be recategorized. The DOI believes that, prior to a relicensing application, it and other appropriate agencies should be consulted to identify site-specific concerns regarding the impact of transmission line corridor management on bird populations.

Response: The NRC expects that there will be no construction of new power lines associated with refurbishment and continued operation. A licensee can add transmission facilities without prior NRC approval in accordance with 10 CFR 50.59. If a licensee indicates in their application for license renewal that new lines are to be constructed in conjunction with license renewal, the NRC will assess the impacts of these lines in accordance with NEPA and CWA Section 404 requirements.

No new transmission line construction (in bogs or elsewhere) is anticipated as a result of license renewal. As discussed in Section 4.5.7 of the draft GEIS, no transmission line associated with any nuclear plant has been identified as causing significant impacts on the functions and values of a wetland or floodplain. Specifying that line maintenance occur in winter is not feasible since the type of line maintenance that would damage vegetation would be in response to line failures, which generally require immediate attention. Therefore, the results of the analysis indicate that the issue meets the criteria for Category 1 (based on the new definition of issue categories).

On use of the term "standard practices," the NRC means known practices that have been customarily employed. The following useful publications exist, although none has been adopted as a standard: "Electric Power Transmission and the Environment," U.S. Federal Power Commission, Washington, DC, between 1970 and 1972; "General Environmental Guidelines for Evaluating and Reporting the Effects of Nuclear Power Plant Site Preparation: Plant and Transmission Facilities Construction," Hittman Associates for the Atomic Industrial Forum, New York, 1974; and "Management of Transmission Line Rights-of-Way for Fish and Wildlife," Michael T. Galvin, Project Manager, DOI, FWS, Washington, DC, 1979. The NRC agrees that the term "standard practices," as used in the proposed rule, may be too vague. The final rule has been revised to be clearer and consistent with the discussion in the GEIS.

Regarding the concern about use of herbicides, the NRC expects that use of herbicides for transmission line ROW maintenance will be done consistent with FIFRA and implementing regulations, and that registered herbicides will be used. No evidence has been presented which

would demonstrate that this has not been the usual practice of the industry. A pesticide is registered under FIFRA after the EPA has determined that the product will perfom its intended function without unreasonable adverse effects on the environment, and that, when used in accordance with widespread and commonly recognized practice, will not generally cause unreasonable adverse effects on the environment (40 CFR 152.112 [e]). Where such assurance cannot be derived, the pesticide may still be registered, but with use restricted to a certified application (40 CFR 152.170). If a nuclear utility were to apply a restricted pesticide, it would be required to use a licensed operator.

Regarding the impacts of power line corridors on wildlife, the GEIS analysis was based on a relatively large number of publications that were cited in the text. The generic conclusion that power line corridors do not have significant adverse impacts on wildlife populations is consistent with this literature. The NRC knows of no other literature that would change this conclusion, and no additional information was provided by the commenters. Therefore, the NRC believes that the impacts of ROW maintenance on wildlife are of small significance for all plants (i.e., Category 1).

Concern Nmbr: TEL.016
Topic: Terrestrial Ecology and Land Use
Subtopic: Onsite land use
Associated Comment Nmbr(s): 038.021 038.022
Concern: The MDNR implied that the land use assumption for calculating the overall impact of a generic 1,000 MW(e) light water reactor should be site-specific. There is great variability among the individual sites as to the amount and quality of the land, e.g., Arizona will have more utility-owned land available then New York. This variability does not get captured in the "average" land use determination. The MDNR also suggested that the document should note that "permanent" land commitment may require substantial financial resources and may generate enormous volumes of very slightly contaminated soil and other materials should a power plant be decontaminated and restored to a near-original condition in order to be available for nonindustrial use.

Response: The comment reflects a misunderstanding of Section 4.8.1 of the draft GEIS. The land use described is for the fuel cycle facilities that support a hypothetical 1,000 MWe commercial nuclear reactor. The land used for the reactor site itself is not included. The impacts for the hypothetical model reactor are scaled linearly to determine the fuel cycle impacts of an actual reactor. For example, to determine the impacts attributable to an 1,100 MWe reactor, multiply the numbers in draft Table 4.17 by 1.1. Discussion of the impacts of waste generated as part of decommissioning is provided in Chapter 7 of the GEIS.

Concern Nmbr: TEL.017
Topic: Terrestrial Ecology and Land Use
Subtopic: Environmental review process
Associated Comment Nmbr(s): 054.055
Concern: While the State of Minnesota does not dispute the GEIS findings on fish and wildlife issues at this time, it notes that circumstances relating to these issues change over time. Information from State fish and wildlife agencies must become part of the NRC's consideration of a license renewal application in a timely manner and without undue administrative burden. The proposed environmental review process does not adequately define how changing circumstances would be recognized by the NRC and incorporated into its review of nuclear power plant license renewal applications.

Response: Minnesota's comment need not be limited to the timing of the relicensing decision. Should circumstances change, a State can approach the NRC regarding the adequacy and effectiveness of regulatory programs at any time.

APPENDIX D

RESPONSES TO NUMARC'S ENCLOSURE 3 COMMENTS ON THE DRAFT GEIS

RESPONSES TO NUMARC'S ENCLOSURE 3 COMMENTS

NUMARC's written comments on the draft GEIS consisted of a cover letter and three enclosures. Enclosure 3, "Detailed Comments," contained specific comments on the proposed rule, each chapter of the draft GEIS, the Environmental Standard Review Plan (NUREG-1429), and the Draft Regulatory Guide DG-4002. There were a total of 273 separate comments in Enclosure 3. Each comment was reviewed, classified by subject area (e.g., terrestrial ecology, waste management), and given to the appropriate specialist for resolution, if necessary. The review of these comments resulted in the following actions:

- 79 comments concerned the chapter on alternatives to license renewal. This chapter has been rewritten in response to numerous comments from several commenters, particularly the State agencies, regarding the analytical approach to the evaluation of alternatives. NUMARC's comments were reviewed in the context of these other comments regarding the alternatives and were collectively addressed in the text revisions.

- 29 comments pertained to the draft GEIS analysis of economics and need for power. Those sections of the GEIS have been deleted in response to comments by State regulators who felt that the generic analysis did not adequately accommodate plant-specific differences and might prejudice regulatory decisions that are within their purview and outside the NRC's.

- 23 comments pertained to Chapter 2 of the draft GEIS, which described the nuclear power plants and the modifications necessary for license renewal. This chapter has been extensively revised. NUMARC's comments were collectively addressed in the text revisions.

- 88 other comments led to revisions to the GEIS, with resulting changes rarely exceeding a few sentences in length. In about half of these comments, NUMARC pointed out necessary corrections, updates, and editorial revisions that were handled with minor changes in the GEIS text, often using the change suggested by NUMARC. Many of the other comments typically noted incomplete or unclear statements in the GEIS that required clarification. A few comments, such as those on Chapter 6 (Waste Management), required a more comprehensive look at an issue and were addressed generically during fairly extensive rewrites to some GEIS sections.

- 54 comments were reviewed, but did not warrant any change in the GEIS text.

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APPENDICES

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10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

THIS REPORT DOCUMENTS THE NUCLEAR REGULATORY COMMISSION (NRC) STAFF REVIEW OF PUBLIC COMMENTS PROVIDED IN RESPONSE TO THE NRC'S PROPOSED AMENDMENTS TO 10 CODE OF FEDERAL REGULATIONS (CFR) PART 51, WHICH ESTABLISH NEW REQUIREMENTS FOR THE ENVIRONMENTAL REVIEW OF APPLICATIONS FOR THE RENEWAL OF OPERATING LICENSES OF NUCLEAR POWER PLANTS. THE PUBLIC COMMENTS INCLUDE THOSE SUBMITTED IN WRITING, AS WELL AS THOSE PROVIDED AT PUBLIC MEETINGS THAT WERE HELD WITH OTHER FEDERAL AGENCIES, STATE AGENCIES, NUCLEAR INDUSTRY REPRESENTATIVES, PUBLIC INTEREST GROUPS, AND THE GENERAL PUBLIC. THIS REPORT ALSO CONTAINS THE NRC STAFF RESPONSE TO THE VARIOUS CONCERNS RAISED, AND HIGHLIGHTS THE CHANGES MADE TO THE FINAL RULE AND THE SUPPORTING DOCUMENTS IN RESPONSE TO THESE CONCERNS.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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