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OAK RIDGE NATIONAL LABORATORY

MARTIN MARIETTA

Historical Literature Review on Waste Classification & Categorization

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Jason P. Williams

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Chemical Technology Division

Historical Literature Review on Waste Classification & Categorization

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INTRODUCTION

The Staff of the Waste Management Document Library (WMDL), in cooperation with Allen Croff have been requested to provide information support for a historical search concerning waste categorization/classification. This bibliography has been compiled under the sponsorship of Oak Ridge National Laboratory's Chemical Technology Division to help in Allen's ongoing committee work with the NRC/NRCP. After examining the search, Allen Croff saw the value of the search being published. Permission was sought from the database providers to allow limited publication (i.e. 20-50 copies) of the search for internal distribution at the Oak Ridge National Laboratory and for Allen Croffs associated committee.

Citations from the database providers who did not grant legal permission for their material to be published have been omitted from the literature review. Some of the longer citations have been included in an abbreviated form in the search to allow the format of the published document to be shortened from approximately 1400 pages.

The following databases, managed by Dialog Information Services, were searched, contacted, and granted limited publication permission for citations (and often abstracts) included in this search :

Inspec (Dialog file #2), Biosis Previews (Dialog file #5), NTIS (National Technical Information Service- Dialog file #6), Compendex Plus (Dialog file #8), ABI Inform (Dialog file #15), PTS Prompt (Dialog file #16), Metadex (Dialog file #32), Enviroline (Dialog file #40), Pollution Abstracts (Dialog file #41), TRIS (Transportation Research Information Services- Dialog file #63), Embase (Dialog file #73), Conference Papers Index (Dialog file #77), Georef (Dialog file #89), CIS (Congressional Information Services- Dialog file #101), ASI (American Statistics Index- Dialog file #102), Energy Science & Technology (Dialog file #103), Aerospace (Dialog file #108), NSA (Nuclear Science Abstracts - Dialog file # 109), Water Resource Abstracts (Dialog file #117), Federal Register Abstracts (Dialog file #136), Medline (Dialog file #155), Toxline (Dialog file #156), National Institute for Occupational Safety and Health (Dialog file #161), Commerce Business Daily (Dialog file #194), Federal Research in Progress (Dialog file #266), Chemical Abstracts (Dialog file #399), Investext (Dialog file #545), McGraw Hill Publications Online (Dialog file #624), PTS Newsletter Database (Dialog File #636) and the Federal Register (Dialog file #669)

CITATION

Citation 1

<DIALOG File 103: >
03466191 EDB-93-045067
Title: GTCC LLW mixed waste assessment final report
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States); Ebasco Environmental (United States); (Code: 9507781; 9528597)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: Sep 1992; (78 p)
Report Number(s): DOE/LLW-156; INEL/MISC--92084
Order Number: DE93005177
Contract Number (DOE): AC07-76ID01570
Document Type: Report
Language: English
Journal Announcement: EDB9308
Availability: OSTI; NTIS; INIS; GPO Dep.
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This report uses information from a previous US Department of Energy study to identify greater-than-class C low-level radioactive waste (GTCC LLW) that might also be hazardous (GTCC LLW mixed waste). The report describes how to classify the waste as GTCC LLW mixed waste and then uses that process to estimate volumes and types of GTCC LLW mixed waste that are in storage and that are likely to be generated through the year 2035.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive waste inventories
Descriptors: forecasting; hazardous materials; liquid wastes; mercury; metals; mixtures; radioactive waste storage; sludges; solid wastes
Broader Terms: dispersions; elements; management; materials; metals; radioactive materials; radioactive waste management; radioactive wastes; storage; waste management; waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 2

<DIALOG File 103: >
03457548 NOV-93-006073; INS-93-004934; EDB-93-036424
Title: Simplistic treatment and exemplary disposal of pre-sorted hazardous and radioactive wastes
Author(s): Darnell, G.R. (Idaho National Engineering Lab., Idaho Falls, ID (United States))
Title: Proceedings of emerging technologies for hazardous waste management
Author(s)/Editor(s): Tedder, D.W. (School of Chemical Engineering, Georgia Inst. of Technology, Atlanta, GA (United States))
Conference Title: American Chemical Society (ACS) special symposium on merging technologies in hazardous waste management
Conference Location: Atlanta, GA (United States); Conference Date: 21-23 Sep 1992
Publisher: Washington, DC (United States) American Chemical Society
Publication Date: 1992; p 397-398; (755 p)
Report Number(s): CONF-9209226--
Contract Number (DOE): AC07-76ID01570

Document Type: Analytic of a Book; Conference Literature
Language: English
Journal Announcement: EDB9307
Availability: American Chemical Society, 1155 Sixteenth St. NW, Washington, DC 20036 (United States)
Subfile: EPA (Energy Abstracts for Policy Analysis); ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor) US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Most contact-handled waste treatment and disposal systems are divided again and again and become so complex and expensive that few systems are built and the cycle of research and technical reviews are repeated once again. As will be show in this paper, that need not happen. Class A low-level radioactive waste (LLW) constitutes at least 90 percent of all LLW at most sites, and as much as 97 percent at some sites. When limited to contact-handled waste, the percentages are even higher. There is no requirement to stabilize this waste, so it is usually treated to minimum requirements, or is not treated at all, and is disposed of in its own area of the disposal site. Contact-handled Class B and C LLW then become a problem, because if they are incinerated an grouted, and/or vitrified, they will likely become greater Than Class-C (GTCC) waste. This is due to extreme volume reduction and subsequent concentration of radionuclides. Then they will require either storage or disposal as a high-level waste. There are many other subdivisions based on specific waste type, generator desires and customs, curie count, moisture content, and so forth. It all becomes so complex that meaningful decisions are difficult to make, and expenses keep mounting with little resulting action.
Major Descriptors: *hazardous materials -- environmental policy; *hazardous materials -- waste disposal acts; *radioactive waste disposal -- environmental policy; *radioactive waste disposal -- safety standards; *radioactive waste disposal -- site characterization; *radioactive waste disposal -- waste disposal acts; *radioactive waste facilities -- safety standards; *radioactive wastes -- classification
Descriptors: high-level radioactive wastes; low-level radioactive wastes; radioactive waste storage; research programs
Broader Terms: government policies; laws; management; materials; nuclear facilities; radioactive materials; radioactive waste management; radioactive wastes; standards; storage; waste disposal; waste management; waste storage; wastes Subject Categories: 053001* -- Nuclear Fuels -- Environmental Aspects -- Siting -- (1992-) 052002 -- Nuclear Fuels -- Waste Disposal & Storage 290300 -- Energy Planning & Policy -- Environment, Health, & Safety 540250 -- Environment, Terrestrial -- Site Resource & Use Studies -- (1990-) INIS Subject Categories: C5212* -- Environmental aspects of siting of fission fuel cycle facilities -- (1992-) E5200 -- Waste Disposal C5600 -- Environmental Aspects of Nonnuclear Energy -- (1992-) B3140 -- Seismology & geology

Citation 3

<DIALOG File 103: >
03449565 EDB-93-028441
Title: Current issues in the management of low- and intermediate-level radioactive wastes from Ontario Hydro's CANDU reactors
Author(s): Krasznai, J.P.; Vaughan, B.R.; Williamson, A.S.
Conference Title: American Nuclear Society (ANS) winter meeting
Conference Location: Washington, DC (United States); Conference Date: 11-16 Nov 1990
Source: Transactions of the American Nuclear Society (United States) v 62
Coden: TANSAO ISSN: 0003-018X
Publication Date: 1990; p 82-83
Report Number(s): CONF-901101--
Document Type: Journal Article; Conference Literature
Language: English
Journal Announcement: EDB9306
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input); JMT (DOE contractor) US DOE Project/NonDOE Project: NP

Country of Origin: Canada
Country of Publication: United States
Abstract: Nuclear generating stations (NGSs) in Canada are operated by utilities in Ontario, Quebec, and New Brunswick. Ontario Hydro, with a committed nuclear program of 13,600 MW(electric) is the major producer of CANDU pressurized heavy-water reactor (PHWR) low- and intermediate-level radioactive wastes. All radioactive wastes with the exception of irradiated fuel are processed and retrievably stored at a centralized facility at the Bruce Nuclear Power Development site. Solid-waste classifications and annual production levels are given. Solid-waste management practices at the site as well as the physical, chemical, and radiochemical characteristics of the wastes are well documented. The paper summarizes types, current inventory, and estimated annual production rate of liquid waste. Operation of the tritium recovery facility at Darlington NGS, which removes tritium from heavy water and produces tritium gas in the process, gives rise to secondary streams of tritiated solid and liquid wastes, which will receive special treatment and packaging. In addition to the treatment of radioactive liquid wastes, there are a number of other important issues in low- and intermediate-level radioactive waste management that Ontario Hydro will be addressing over the next few years. The most pressing of these is the reduction of radioactive wastes through in-station material control, employee awareness, and improved waste characterization and segregation programs. Since Ontario Hydro intends to store retrievable wastes for > 50 yr, it is necessary to determine the behavior of wastes under long-term storage conditions.
Major Descriptors: *Candu type reactors -- radioactive waste management; *intermediate-level radioactive wastes -- radioactive waste management; *low-level radioactive wastes -- radioactive waste management
Descriptors: carbon 14; decontamination; minimization; nondestructive testing; organic compounds; packaging; radiation hazards; radioactive waste disposal; radioactive waste facilities; radioactive waste processing; research programs; spent fuels; tritium recovery
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cleaning; energy sources; even-even nuclei; fuels; hazards; health hazards; heavy water moderated reactors; isotopes; light nuclei; management; materials; materials testing; nuclear facilities; nuclear fuels; nuclei; pressure tube reactors; processing; radioactive materials; radioactive waste management; radioactive wastes; radioisotopes; reactor materials; reactors; testing; thermal reactors; waste disposal; waste management; waste processing; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 220502 -- Nuclear Reactor Technology -- Environmental Aspects -- Radioactive Effluents 210400 -- Power Reactors, Nonbreeding, Otherwise Moderated or Unmoderated
INIS Subject Categories: E5000* -- Waste Management C5221 -- Environmental aspects of radioactive releases from fission reactors -- (1992-) E3400 -- Power Reactors, Nonbreeding, Heavy Water or Otherwise Moderated or Unmoderated

Citation 4

<DIALOG File 103: >
03438744 EDB-93-017620
Title: Transportation management workshop: Proceedings
Corporate Source: USDOE Office of Environmental Restoration and Waste Management, Washington, DC (United States). Transportation Management; Div. (Code: 9531229)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Conference Title: Department of Energy (DOE) transportation management program workshop
Conference Location: Gaithersburg, MD (United States); Conference Date: 18-20 Aug 1992
Publication Date: 1992; (810 p)
Report Number(s): CONF-9208125--
Order Number: DE93002378
Document Type: Report; Conference Literature
Language: English
Journal Announcement: EDB9304
Availability: OSTI; NTIS; GPO Dep.
Distribution: (Report): 1 (MF):4 MN-900
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); NTS (NTIS). TIC

(Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This report is a compilation of discussions presented at the Transportation Management Workshop held in Gaithersburg, Maryland. Discussions are presented in question/answer format with charts. Topics include waste packaging, personnel training, robotics, transportation routing, certification, containers, and waste classification.
Major Descriptors: *hazardous materials -- transport; *radioactive materials -- transport
Descriptors: containers; management; packaging; regulations; training; US DOE; US DOT; US NRC; waste transportation
Broader Terms: education; management; materials; national organizations; transport; waste management
Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage

Citation 5

<DIALOG File 103: >
03434119 NOV-93-001007; INS-93-001625; EDB-93-012995
Title: Plans for managing greater-than-class C low-level waste
Author(s): Newberry, W.F.; Coleman, J.A. (Office of Environmental Restoration and Waste Management, US DOE, Germantown, MD (United States))
Title: Proceedings of the international meeting on nuclear and hazardous waste management
Conference Title: Spectrum '90: American Nuclear Society (ANS) international meeting on radioactive waste technologies, decontamination, and hazardous wastes
Conference Location: Knoxville, TN (United States); Conference Date: 30 Sep - 4 Oct 1990
Publisher: La Grange Park, IL (United States) American Nuclear Society
Publication Date: 1990; p 55-57; (510 p)
Report Number(s): CONF-900977--
ISBN: 0-89448-157-6
Document Type: Analytic of a Book; Conference Literature
Language: English
Journal Announcement: EDB9303 Availability: American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60525 (United States)
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Low-level waste is defined in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (Title I, Public Law 99-240) as radioactive waste that is neither high-level radioactive waste, spent nuclear fuel, nor by-product material (mill tailings). This paper presents proposed plans for the Department of Energy to fulfill its responsibility to dispose of GTCC LLW under the 1985 law, and to ensure that safe options are available for long-term management of such, pending the availability of disposal capacity. In the absence of a concentration-based definition for high-level waste, there currently is no upper bound for the concentration of radionuclides in low-level waste.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- government policies; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste disposal -- planning; *radioactive waste disposal -- safety analysis
Descriptors: chemical composition
Broader Terms: management; materials; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 054000 -- Nuclear Fuels -- Health & Safety INIS Subject Categories: E5200* -- Waste Disposal F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes E2300 -- Reactor Fuels

Citation 6

<DIALOG File 103: >
03434060 DEN-92-015495; EDB-93-012936
Title: Radioactive wastes - inventories and classification
Original Title: Uebersicht ueber radioaktive Abfaelle
Author(s): Brennecke, P.; Hollmann, A. (Bundesamt fuer Strahlenschutz, Salzgitter (Germany))
Title: Disposal of radioactive wastes. Proceedings
Original Title: Entsorgung radioaktiver Abfaelle. Vortraege
Author(s)/Editor(s): Kugel, K.; Brennecke, P.; Giller, H. (eds.)
Corporate Source: Bundesamt fuer Strahlenschutz, Braunschweig (Germany). Fachbereich Nukleare Entsorgung und Transport (Code: 9204005)
Conference Title: Information meeting 'Disposal of radioactive wastes'
Conference Location: Berlin (Germany) Conference Date: 25-26 Nov 1991
Publication Date: Jun 1992 p 13-27 (140 p)
Report Number(s): BfS-ET-12/92 CONF-9111277--
Order Number: DE93742804
Document Type: Analytic of a Report; Conference Literature
Language: German
Journal Announcement: EDB9303
Availability: OSTI; NTIS (US Sales Only); INIS
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange). DEN (Federal Republic of Germany (sent to DOE from))
US DOE Project/NonDOE Project: NP
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: A survey is given of the origins, types, conditioning, inventories, and expected abundance of radioactive wastes in the future in the Federal Republic of Germany. The Federal Government's radioactive waste disposal scheme provides that radioactive wastes be buried in deep geological formations which are expected to ensure a maintenance-free, unlimited and safe disposal without intentional excavation of the wastes at a later date. (orig./BBR).
Major Descriptors: *radioactive wastes -- classification
Descriptors: federal republic of germany; forecasting; gaseous wastes; ground disposal; inventories; liquid wastes; radioactive waste disposal; radioactive waste processing; solid wastes; waste forms
Broader Terms: developed countries; europe; management; materials; processing; radioactive materials; radioactive waste management; waste disposal; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage

Citation 7

<DIALOG File 103: >
03414072 EDB-92-176829
Title: Method for waste classification of non-fuel assembly core components
Author(s): Williamson, D.; Tulenko, J.S. (Univ. of Florida, Gainesville (United States))
Conference Title: American Nuclear Society annual meeting
Conference Location: Boston, MA (United States) Conference Date: 7-12 Jun 1992
Source: Transactions of the American Nuclear Society (United States) v 65. Coden: TANSA ISSN: 0003-018X
Publication Date: 1992 p 90-91
Report Number(s): CONF-920606--
Document Type: Journal Article; Conference Literature

Language: In English
Journal Announcement: EDB9224
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The disposal of non-fuel assembly (NFA) core hardware has not been a routine matter because differing applications of the 10CFR61 (of the Code of Federal Regulations) waste classification can lead to designation of the same NFA irradiated component as class C (low level) or greater than class C waste. The question to dispose of the NFA hardware in a low-level facility or a deep geological repository has economic and planning ramifications for utilities and waste disposal facilities. A general formulation has been developed at the University of Florida to support planning decisions regarding the classification of NFA hardware. The formulation concludes that Zircaloy burnable poison assemblers, Zircaloy shrouds, and some control rod assemblies may be disposed of as low-level waste. Other components, including most control rod assemblies and nearly all Inconel components, may require deep geological repository burial.
Major Descriptors: *BWR type reactors -- radioactive waste management; *PWR type reactors -- radioactive waste management; *radioactive wastes -- classification
Descriptors: burnable poisons; calculation methods; control elements; guide tubes; high-level radioactive wastes; in core instruments; inconel alloys; irradiation; low-level radioactive wastes; neutron flux; nickel 63; niobium 94; radioactive waste disposal; reactor components; specifications; stainless steels; trace amounts; US NRC; zircaloy
Broader Terms: alloys; beta decay radioisotopes; beta-minus decay radioisotopes; enriched uranium reactors; even-odd nuclei; high alloy steels; intermediate mass nuclei; internal conversion radioisotopes; iron alloys; iron base alloys; isomeric transition isotopes; isotopes; management; materials; minutes living radioisotopes; national organizations; neutron absorbers; nickel alloys; nickel base alloys; nickel isotopes; niobium isotopes; nuclear poisons; nuclei; odd-odd nuclei; power reactors; radiation flux; radioactive materials; radioactive waste management; radioactive wastes; radioisotopes; reactor components; reactor instrumentation; reactor materials; reactors; steels; thermal reactors; tubes; waste disposal; waste management; wastes; water cooled reactors; water moderated reactors; years living radioisotopes; zirconium alloys; zirc onium base alloys
Subject Categories: 220900* -- Nuclear Reactor Technology -- Reactor Safety 210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled 210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled 052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E3100* -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types) E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types) E5000 -- Waste Management

Citation 8

<DIALOG File 103: >
03412911 EDB-92-175668
Title: Expert System analysis of non-fuel assembly hardware and spent fuel disassembly hardware: Its generation and recommended disposal (Non-fuel bearing components of the reactor core.)
Author(s)/Editor(s): Williamson, D.A.
Corporate Source: Oak Ridge Associated Universities, Inc., TN (United States) (Code: 4828000)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: 1991 (326 p)
Report Number(s): DOE/OR/00033-T499
Order Number: DE93001698
Contract Number (DOE): AC05-76OR00033
Note: Thesis submitted by D.A. Williamson to the University of Florida
Academic Degree: Thesis (Ph.D.)
Document Type: Report; Dissertation or Thesis
Language: In English

Journal Announcement: EDB9224
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-800
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Almost all of the effort being expended on radioactive waste disposal in the United States is being focused on the disposal of sprint Nuclear Fuel, with little consideration for other areas that will have to be disposed of in the same facilities. one area of radioactive waste that has not been addressed adequately because it is considered a secondary part of the waste issue is the disposal of the various Non-Fuel Bearing Components of the reactor core. These hardware components fall somewhat arbitrarily into two categories: Non-Fuel Assembly (NFA) hardware and Spent Fuel Disassembly (SFD) hardware. This work provides a detailed examination of the generation and disposal of NFA hardware and SFD hardware by the nuclear utilities of the United States as it relates to the Civilian Radioactive Waste Management Program. All available sources of data on NFA and SFD hardware are analyzed with particular emphasis given to the Characteristics Data Base developed by Oak Ridge National Laboratory and the characterization work performed by Pacific Northwest Laboratories and Rochester Gas Electric. An Expert System developed as a portion of this work is used to assist in the prediction of quantities of NFA hardware and SFD hardware that will be generated by the United States' utilities. Finally, the hardware waste management practices of the United Kingdom, France, Germany, Sweden, and Japan are studed for possible application to the disposal of domestic hardware wastes. As a result of this work, a general classification scheme for NFA and SFD hardware was developed. Only NFA and SFD hardware constructed of zircaloy and experiencing a burnup of less than 70,000 MWD/MTIHM and PWR control rods constructed of stainless steel are considered Low-Level Waste. All other hardware is classified as Greater-Than Class-C waste.
Major Descriptors: *radioactive waste disposal; *radioactive wastes -- classification
Descriptors: expert systems; fuel assemblies; reactor cores; spent fuels; systems analysis
Broader Terms: energy sources; fuels; management; materials; nuclear fuels; radioactive materials; radioactive waste management; reactor components; reactor materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 990200 -- Mathematics & Computers
INIS Subject Categories: E5200* -- Waste Disposal F5000 -- Mathematical Methods & Computer Codes

Citation 9

<DIALOG File 103: >
03412778 EDB-92-175535
Title: Enhanced public participation in NRC decision making
Author(s): Cameron, F.X. (U.S. Nuclear Regulatory Commission, Washington, DC (United States))
Conference Title: American Nuclear Society annual meeting
Conference Location: Boston, MA (United States) Conference Date: 7-12 Jun 1992
Source: Transactions of the American Nuclear Society (United States) v 65. Coden: TANSA ISSN: 0003-018X
Publication Date: 1992 p 40-41
Report Number(s): CONF-920606--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB9224
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The U.S. Nuclear Regulatory Commission (NRC) published its below-regulatory-concern (BRC) policy statement in 1990. The policy provided a framework within which the NRC would promulgate rules or make

licensing decisions to exempt from some or all regulatory controls certain practices involving small quantities of radioactive materials. The NRC's adoption of the BRC policy resulted in widespread public concern over the implications of the new policy. In an effort to better understand the nature of those concerns and to ensure that NRC's decisions related to BRC were based on clear and comprehensive information, the commission initiated an evaluation of the potential use of consensus-building techniques to address BRC issues. Based on the recommendations contained in the feasibility evaluation, the NRC, on June 28, 1991, approved the initiation of a phased consensus process to address BRC issues. The purpose of the consensus process was to provide advice to the commission from the full range of affected interests on the broad spectrum of issues related to the subject of BRC.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: decision making; decommissioning; nuclear power plants; public information; public opinion; public relations; radioactive waste disposal; regulations; US NRC
Broader Terms: information; management; materials; national organizations; nuclear facilities; power plants; radioactive materials; radioactive waste management; radioactive wastes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 10

<DIALOG File 103: >
03402179 NOV-92-041155; EDB-92-164936
Title: Treatment of RCRA hazardous/radioactive mixed waste
Author(s): Redmon, M.E.; Williams, M.J.; Liedle, S.D. (Bechtel National, Inc., Oak Ridge, TN (US))
Title: Proceedings of the third international conference on new frontiers for hazardous waste management
Conference Title: 3. international conference on new frontiers for hazardous waste management
Conference Location: Pittsburgh, PA (United States) Conference Date: 10-13 Sep 1989
Publisher: Cincinnati, OH (United States) Environmental Protection Agency
Publication Date: 1989 p 564-571 (604 p)
Report Number(s): CONF-890927--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9222
Availability: Environmental Protection Agency, 26 W. St. Clair St., Cincinnati, OH 45268 (United States)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper describes a treatment process for a radioactive/chemical mixed waste sludge. The waste, which was generated during remedial action under the Department of Energy's (DOE) Formerly Utilized Sites Remedial Action Program (FUSRAP), was designated as mixed because of its uranium content (up to 14,000 picoCuries per gram) and the presence of chemical constituents which caused the waste material to fail the Resource Conservation and Recovery Act (RCTA) characteristic test for ignitability.
Major Descriptors: *chemical wastes -- evaluation; *radioactive waste processing -- evaluation; *radioactive wastes -- chemical composition; *radioactive wastes -- classification
Descriptors: combustion; environmental impacts; fuel reprocessing plants; hazardous materials; mixtures; remedial action; resource recovery acts; site characterization; uranium; US DOE
Broader Terms: actinides; chemical reactions; dispersions; elements; laws; management; materials; metals; national organizations; nonradioactive wastes; nuclear facilities; oxidation; processing; radioactive materials; radioactive waste management; thermochemical processes; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)

INIS Subject Categories: E5100* -- Waste Treatment F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes

Citation 11

<DIALOG File 103: >
03402169 NOV-92-043216; INS-92-032762; EDB-92-164926
Title: Partitioning of aqueous high-level wastes State-of-the-art-technology
Author(s): Schulz, W.W.
Title: Proceedings of high level radioactive waste management
Conference Title: 3. international high level radioactive waste management (IHLRWM) conference
Conference Location: Las Vegas, NV (United States) Conference Date: 12-16 Apr 1992
Publisher: La Grange Park, IL (United States) American Nuclear Society
Publication Date: 1992 p 1718-1723 (2425 p)
Report Number(s): CONF-920430--
ISBN: 0-87262-891-4
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9222
Availability: American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60525 (United States)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: In this paper, an integrated set of aqueous-based chemical processes for partitioning and separating actinides, {sup 90}Sr, {sup 99}Tc, {sup 129}I, and {sup 137}Cs from Plutonium Uranium Extraction (PUREX) process high-level and other waste solutions is presented and discussed. This separation scheme involves sequential operation of the PUREX, Transuranium Extraction (TRUEX), Strontium Extraction (SREX), and Phosphotungstate Precipitation (PTA) processes to reduce the concentration of the partitioned radionuclides to or below limits set by the Nuclear Regulatory Commission for Class C Low-Level Waste. Individual partitioning process bases and performance are described. Critical technology areas to complete development and demonstration of the proposed integrated partitioning scheme are listed.
Major Descriptors: *actinides -- separation processes; *fuel reprocessing plants -- purex process; *high-level radioactive wastes -- separation processes; *purex process; *radioactive wastes -- classification; *truex process
descriptors: aqueous solutions; cesium 127; demonstration programs; iodine 129; strontium 90;
technetium 99; technology assessment; US NRC
Broader Terms: alkali metal isotopes; alkaline earth isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; beta-plus decay radioisotopes; cesium isotopes; dispersions; electron capture radioisotopes; elements; even-even nuclei; hours living radioisotopes; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; isomeric transition isotopes; isotopes; materials; metals; mixtures; national organizations; nuclear facilities; nuclei; odd-even nuclei; radioactive materials; radioactive wastes; radioisotopes; reprocessing; separation processes; solutions; strontium isotopes; technetium isotopes; wastes; years living radioi; years living radioisotopes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing 050800 -- Nuclear Fuels -- Spent Fuels Reprocessing
INIS Subject Categories: E5100* -- Waste Treatment B1620 -- Spent fuels reprocessing

Citation 12

<DIALOG File 103: >
03393101 NOV-92-041168; INS-92-031445; EDB-92-155858
Title: Hazardous waste management in research laboratories

Author(s): Sundstrom, G. (Safety and Health Policy Staff, Agricultural Research Service, Hyattsville, MD (US))
Title: Proceedings of the third international conference on new frontiers for hazardous waste management
Conference Title: 3. international conference on new frontiers for hazardous waste management
Conference Location: Pittsburgh, PA (United States) Conference Date: 10-13 Sep 1989
Publisher: Cincinnati, OH (United States) Environmental Protection Agency
Publication Date: 1989 p 226-233 (604 p)
Report Number(s): CONF-890927--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9221
Availability: Environmental Protection Agency, 26 W. St. Clair St., Cincinnati, OH 45268 (United States)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Hazardous waste management in research laboratories benefits from a fundamentally different approach to the hazardous waste determination from industry's. This paper introduces new, statue-based criteria for identifying hazardous wastes (such as radiological mixed wastes and waste oils) and links them to a forward-looking compliance of laboratories, the overall system integrates hazardous waste management activities with other environmental and hazard communication initiatives. It is generalizable to other waste generators, including industry. Although only the waste identification and classification aspects of the system are outlined in detail here, four other components are defined or supported, namely: routine and contingency practices; waste treatment/disposal option definition and selection; waste minimization, recycling, reuse, and substitution opportunities; and key interfaces with other systems, including pollution prevention.
Major Descriptors: *industrial wastes -- chemical composition; *industrial wastes -- classification; *radioactive waste management -- evaluation; *radioactive waste management -- pollution regulations; *radioactive wastes -- classification; *waste processing plants -- environmental impacts; *waste processing plants -- site characterization
Descriptors: hazardous materials; laboratories; liabilities; radioactive waste disposal; radioactive waste processing; recycling
Broader Terms: industrial plants; management; materials; processing; radioactive materials; radioactive waste management; regulations; waste disposal; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing 052002 -- Nuclear Fuels -- Waste Disposal & Storage 053001 -- Nuclear Fuels -- Environmental Aspects -- Siting -- (1992-) 320305 -- Energy Conservation, Consumption, & Utilization -- Industrial & Agricultural Processes -- Industrial Waste Management
INIS Subject Categories: E5100* -- Waste Treatment E5200 -- Waste Disposal C5212 -- Environmental aspects of siting of fission fuel cycle facilities -- (1992-)

Citation 13

<DIALOG File 103: >
03360315 DEN-92-008841; EDB-92-123072
Title: The collection of radioactive wastes suitable for ultimate disposal
Original Title: Endlagergerechte Erfassung radioaktiver Abfaelle
Author(s): Warnecke, E.; Brennecke, P.; Tittel, G.
Title: Ultimate disposal of radioactive wastes. A guide to responsible waste management in a highly industrialized economy
Original Title: Endlagerung radioaktiver Abfaelle. Wegweiser fuer eine verantwortungsbewusste Entsorgung in der Industriegesellschaft
Author(s)/Editor(s): Roethemeyer, H. (Bundesamt fuer Strahlenschutz, Salzgitter (Germany)) (ed.)
Original Series Title: Forschen - Messen - Pruefen
Publisher: Weinheim (Germany) VCH Verlagsges.
Publication Date: 1991 p 139-146 (291 p)

ISBN: 3-527-28174-6
Document Type: Analytic of a Book
Language: In German
Journal Announcement: EDB9217
Subfile: ETD (Energy Technology Data Exchange). DEN (Federal Republic of Germany (sent to DOE from))
US DOE Project/NonDOE Project: NP
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: To assess the suitability of radioactive wastes for ultimate disposal, a basic division into heat-producing wastes and wastes with negligible heat development was made. To further characterize radioactive wastes, it is necessary to categorize them by an individual description according to the requirements of the repository operation and safety analyses. Examples for waste forms to be emplaced are given. (DG).
Major Descriptors: *radioactive waste disposal -- waste forms; *radioactive wastes -- classification; *waste forms -- containers
Descriptors: safety; underground disposal
Broader Terms: management; materials; radioactive materials; radioactive waste management; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 14

<DIALOG File 103: >
03360259 EDB-92-123016
Title: Development and application of a conceptual aproach for defining high level waste
Author(s)/Editor(s): Croff, A.G.; Forsberg, C.W. (Oak Ridge National Lab., TN (United States)); Cohen, J.J.; Smith, C.F.; Miller, D.E. (Science Applications International Corp. (United States))
Corporate Source: Oak Ridge National Lab., TN (United States) (Code: 4832000)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: Jan 1985 (92 p)
Report Number(s): DOE/OR/21400-T471 SAIC--85/1569
Order Number: DE92017536
Contract Number (DOE): AC05-84OR21400
Document Type: Report
Language: In English
Journal Announcement: EDB9217
Availability: OSTI; NTIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-810
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Waste Policy Act (NWPA) of 1982 characterizes high-level radioactive waste (HLW) as having two key attributes: HLW is waste that is highly radioactive" and" "requires permanent isolation." In this report, these two key attributes are analyzed to provide a conceptual technical definition for HLW that is consistent with the NWPA as well as other existing and proposed regulations. Also considered in deriving a suitable definition were engineering, health, and safety factors. The conceptual approach is applied to the complete spectrum of radioactive wastes and disposal techniques to provide an overall waste classification framework.
Major Descriptors: *high-level radioactive wastes
Descriptors: chemical composition; radioactive waste management; radioactivity; regulations; spent fuels
Broader Terms: energy sources; fuels; management; materials; nuclear fuels; radioactive materials; radioactive wastes; reactor materials; waste management; wastesk

Subject Categories: 052000* -- Nuclear Fuels -- Waste Management

Citation 15

<DIALOG File 103: >
03352236 EDB-92-114993
Title: Radiological characterization of highly neutron-activated metal components from reactor decommissioning wastes
Author(s): Robertson, D.E.; Haggard, D.L.; Wynoff, N.L. (Pacific Northwest Lab., Richland, WA (United States))
Title: Second international conference on methods and applications of radioanalytical chemistry. Abstracts
Conference Title: International topical conference on methods and applications of radioanalytical chemistry II (MARC-2)
Conference Location: Kona, HI (United States) Conference Date: 21-27 Apr 1991
Publisher: Washington, DC (US) American Nuclear Society
Publication Date: 1991 p 10 (88 p)
Report Number(s): CONF-910422--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9216
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: A number of nuclear power plants throughout the world have reached retirement status and have been scheduled for decommissioning. A large volume and variety of radioactive decommissioning wastes will be generated and disposed of during these operations, including highly neutron-activated metal components (dose rates of 1,000s of R/h) from within the reactor pressure vessel. Accurate and precise measurements of the 10CRF61 radionuclide contents of these components are necessary to determine their waste classification, shipping requirements, and disposal alternatives. During the past two years a unique opportunity has been available to perform detailed radiological and stable element characterizations of spent fuel assembly hardware, spent reactor control rods, and decommissioned reactor pressure vessel steel. During this study it has been possible to compare three methods of determining the curie contents of these highly radioactive materials: (1) hotcell sampling and laboratory radiochemical analyses, (2) direct assay techniques involving special dose-to-curie conversion methods, and (3) calculational methods using neutronics and activation codes. This paper describes the methods and techniques used for these three types of determinations, the results of the measurements and calculations, and compares the accuracy of the direct assay and calculational methods with the actual laboratory measurements.
Major Descriptors: *reactor components -- radioactivity
Descriptors: comparative evaluations; control elements; nuclear models; quantitative chemical analysis; radioactive wastes; radiochemical analysis; radioisotopes; reactor decommissioning; remote handling; sampling
Broader Terms: chemical analysis; decommissioning; evaluation; isotopes; materials; mathematical models; quantitative chemical analysis; radioactive materials; reactor components; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
INIS Subject Categories: E5000* -- Waste Management B1110 -- Nuclear methods in chemical & isotopic analysis

Citation 16

<DIALOG File 103: >
03338778 EDB-92-101535
Title: Regulatory aspects of sludge management
Author(s): Sharples, F.E. (Martin Marietta Energy Systems, Inc., Oak Ridge, TN (United States))

Title: Proceedings of the workshop on radioactive, hazardous, and/or mixed waste sludge management
Author(s)/Editor(s): Lomenick, T.F. (ed.)
Corporate Source: Oak Ridge K-25 Site, TN (United States) (Code: 9528600)
Conference Title: Workshop on radioactive, hazardous, and/or mixed wastes sludge management
Conference Location: Knoxville, TN (United States) Conference Date: 4-5 Dec 1990
Publication Date: Jan 1992 p 195-212 (363 p)
Report Number(s): CONF-901264--
Order Number: DE92012667
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9214
Avaliability: OSTI; NTIS; INIS
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The paper presents an overview of radioactive waste land disposal restrictions by discussing the following topics: highlights of Resource Conservation and Recovery Act history; purposes of land disposal restrictions; regulatory definition of land disposal; US Environmental Protection Agency (EPA) implementation of land disposal restrictions; schedules for implementing land disposal restrictions; solvent and dioxin wastes; classification of liquid hazardous and radioactive wastes; generator and treatment, storage, and disposal responsibilities; variances and extensions; and options for mixed waste management. Land disposal restrictions take into account the long-term uncertainties associated with land disposal, the need to manage waste right the first time they are disposed, and the persistence toxicity, mobility, propensity to bioaccumulate, and volume. In the Department of Energy system land disposal restrictions affect mixed waste management and site remedial action programs.
Major Descriptors: *hazardous materials -- waste management; *low-level radioactive wastes -- radioactive waste management; *radioactive waste management -- regulations
Descriptors: chlorinated aromatic hydrocarbons; cyanides; dioxin; environmental impacts; ground disposal; information needs; lead; nickel; public health; resource recovery acts; selenium; sludges; solidification; solvents; thallium; US EPA
Broader Terms: aromatics; elements; halogenated aromatic hydrocarbons; heterocyclic compounds; laws; management; materials; metals; national organizations; organic chlorine compounds; organic compounds; organic halogen compounds; organic oxygen compounds; phase transformations; radioactive materials; radioactive wastes; semimetals; transition elements; waste disposal; waste management; wastes
Subject Categories: 054000* -- Nuclear Fuels -- Health & Safety 052000 -- Nuclear Fuels -- Waste Management 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 053002 -- Nuclear Fuels -- Environmental Aspects -- Radioactive Effluents -- (1992-) 053003 -- Nuclear Fuels -- Environmental Aspects -- Chemical & Thermal Effluents -- (1992-)
INIS Subject Categories: E2300* -- Reactor Fuels E5000 -- Waste Management F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes C5222 -- Environmental aspects of radioactive releases from fission fuel cycle facilities -- (1992-) C5232 -- Environmental aspects of chemical & thermal releases from fission fuel cycle facilities -- (1992-)

Citation 17

<DIALOG File 103: >
03338703 NOV-92-021327; EDB-92-101460
Title: The hydro nuclear services dry active waste processing system
Author(s): Bunker, A.S.
Source: Radiation Protection Management (United States) v 2:3. Coden: RPMAE ISSN: 0740-0640
Publication Date: Apr 1985 p 65-72
Document Type: Journal Article

Language: In English
Journal Announcement: EDB9214
Subfile: ETD (Energy Technology Data Exchange). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: There is a real need for a dry active waste processing system that can separate clean trash and recoverable items from radwaste safely and efficiently. This paper reports that Hydro Nuclear Services has produced just such a system and is marketing it as a DAW Segregation/Volume Reduction Process. The system is a unique, semi-automated package of sensitive monitoring instruments of volume reduction equipment that separates clean trash from contaminated and recoverable items in the waste stream and prepares the clean trash for unrestricted release. What makes the HNS system truly unique is its end product - clean trash.
Major Descriptors: *radioactive effluents -- risk assessment; *radioactive waste processing -- safety standards; *radioactive wastes -- classification; *radioactive wastes -- minimization; *radioactive wastes -- radiation monitoring; *radioactive wastes -- volume
Descriptors: radioactive waste disposal
Broader Terms: management; materials; monitoring; processing; radioactive materials; radioactive waste management; radioactive wastes; standards; waste disposal; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing 052002 -- Nuclear Fuels -- Waste Disposal & Storage 054000 -- Nuclear Fuels -- Health & Safety 053002 -- Nuclear Fuels -- Environmental Aspects -- Radioactive Effluents -- (1992-)

Citation 18

<DIALOG File 103: >
03338682 NOV-92-020260; EDB-92-101439
Title: Classification and disposal of radioactive wastes History and legal and regulatory requirements
Author(s): Kocher, D.C. (Oak Ridge National Lab., TN (United States))
Source: Radiation Protection Management (United States) v 7:4. Coden: RPMAE ISSN: 0740-0640
Publication Date: Aug 1990 p 58-78
Contract Number (DOE): AC05-84OR21400
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9214
Subfile: EPA (Energy Abstracts for Policy Analysis); ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This paper reviews the historical development in the U.S. of definitions and requirements for permanent disposal of different classes of radioactive waste. We first consider the descriptions of different waste classes that were developed prior to definitions in laws and regulations. These descriptions usually were not based on requirements for permanent disposal but, rather, on the source of the waste and requirements for safe handling and storage. We then discuss existing laws and regulations for disposal of different waste classes. Current definitions of waste classes are largely qualitative, and thus somewhat ambiguous, and are based primarily on the source of the waste rather than the properties of its radioactive constituents. Furthermore, even though permanent disposal is clearly recognized as the ultimate goal of radioactive water management, current laws and regulations do not associated the definitions of different waste classes with requirement for particular disposal systems. Thus, requirements for waste disposal essentially are unaffected by ambiguities in the present waste classification system.
Major Descriptors: *radioactive waste disposal -- legal aspects; *radioactive wastes -- classification
Descriptors: environmental policy; pollution regulations
Broader Terms: government policies; management; materials; radioactive materials; radioactive waste management; regulations; waste disposal; waste management; wastes

Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 290300 -- Energy Planning & Policy -- Environment, Health, & Safety
INIS Subject Categories: E5000* -- Waste Management F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes C5600 -- Environmental Aspects of Nonnuclear Energy -- (1992-)

Citation 19

<DIALOG File 103: >
03331769 NOV-92-023427; INS-92-018232; EDB-92-094526
Title: Low-level radioactive waste disposal in the United States
Author(s): Bangart, R.L.; Tokar, M. (Nuclear Regulatory Commission, Washington, DC (United States). Div. of Waste Management)
Title: Pressure vessels and components-1991
Author(s)/Editor(s): Brooks, G.N. (Tennessee Univ., Knoxville, TN (United States))
Conference Title: 2. international symposium on stabilization/solidification of hazardous, radioactive and mixed waste
Conference Location: Williamsburg, VA (United States) Conference Date: 29 May - 1 Jun 1990
Publisher: Philadelphia, PA (United States) ASTM
Publication Date: 1991 p 3-11 (501 p)
Report Number(s): CONF-900525--
ISBN: 0-7918-0812-2
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9213
Availability: ASTM, 1916 Race St., Philadelphia, PA 19103 (United States)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).NOV (DOE contractor) US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: In this paper, the authors discuss the U.S. Nuclear Regulatory Commission's (NRC) requirements for structural stability for Classes B and C low-level radioactive wastes (LLW), as expressed in Part 61 to Title 10 of the Code of Federal Regulations (10 CFR Part 61). Also discussed is the guidance developed by the NRC staff for the stabilization method of major current interest. These include the use of solidification/stabilization media, high integrity containers, and engineered alternatives, such as below-ground vaults and earth-mounded concrete bunkers for disposal of LLW.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- stabilization; *radioactive waste facilities -- pollution regulations; *USA -- radioactive waste disposal
Descriptors: concretes; solidification; US NRC
Broader Terms: building materials; developed countries; management; materials; national organizations; North America; nuclear facilities; phase transformations; radioactive materials; radioactive waste management; radioactive wastes; regulations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 056000 -- Nuclear Fuels --Legislation & Regulations -- (1987-) 052001 -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5200* -- Waste Disposal F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes E5100 -- Waste Treatment

Citation 20

<DIALOG File 103: >
03321458 EDB-92-075756
Title: Development of high integrity, maximum durability concrete structures for LLW disposal facilities

Author(s)/Editor(s): Taylor, W.P. (Main (Charles T.), Inc., Charlotte, NC (United States))
Corporate Source: Westinghouse Savannah River Co., Aiken, SC (United States) (Code: 9525316)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Conference Title: Waste management '92
Conference Location: Tucson, AZ (United States) Conference Date: 1-5 Mar 1992
Publication Date: 1992 (6 p)
Report Number(s): WSRC-MS-92-063 CONF-920307--68
Order Number: DE92011102
Contract Number (DOE): AC09-89SR18035
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9211
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-706
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: A number of disposal facilities for Low-Level Radioactive Wastes have been planned for the Savannah River Site. Design has been completed for disposal vaults for several waste classifications and construction is nearly complete or well underway on some facilities. Specific design criteria varies somewhat for each waste classification. All disposal units have been designed as below-grade concrete vaults, although the majority will be above ground for many years before being encapsulated with earth at final closure. Some classes of vaults have a minimum required service life of 100 years. All vaults utilize a unique blend of cement, blast furnace slag and pozzolan. The design synthesizes the properties of the concrete mix with carefully planned design details and construction methodologies to (1) eliminate uncontrolled cracking; (2) minimize leakage potential; and (3) maximize durability. The first of these vaults will become operational in 1992. 9 refs.
Major Descriptors: *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste facilities -- design
Descriptors: concretes; cracks; savannah river plant; service life
Broader Terms: building materials; management; materials; national organizations; nuclear facilities; radioactive materials; radioactive waste management; radioactive wastes; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 21

<DIALOG File 103: >
03312621 NOV-92-021312; EDB-92-086265
Title: Segregation of dry active wastes using an Eberline sorting table monitor
Author(s): Lagarde, G.L. (Florida Power and Light Co., Turkey Point Power Plant, Miami, FL (US)); Hesch, J.K. (Eberline Instrument Corp., Santa Fe, NM (US))
Source: Radiation Protection Management (United States) v 4:5. Coden: RPMAE ISSN: 0740-0640
Publication Date: Sep 1987 p 55-59
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9212
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States

Abstract: This paper reports that nuclear power plants have used a variety of monitoring systems to segregate material that must be handled as low-level radioactive waste from material that can be released for uncontrolled disposal. Most of these systems use gas-flow proportional detectors, scintillation detectors, or a combination of both types of detectors in a shielded counting chamber (bag monitor) or mounted above and below a belt-type conveyor system. At the Health Physics Society Meeting in July 1986, Eberline Instrument Corporation and National Nuclear Corporation introduced different versions of a new and simpler type of waste sorting system--a table with large-area plastic scintillation detectors mounted beneath a sorting/monitoring surface. The Eberline system, designated as the Model STM-200 Sorting Table Monitor, has been evaluated by Florida Power and Light Company at its Turkey Point Plant for a period of about six months.
Major Descriptors: *low-level radioactive wastes -- classification; *nuclear power plants -- radioactive waste management; *radiation monitoring --planning; *radiation protection -- meetings; *radiation protection --planning; *radioactive waste management -- safety standards
Descriptors: gas scintillation detectors; proportional counters; reactor monitoring systems; Turkey Point-3 Reactor; Turkey Point-4 Reactor
Broader Terms: enriched uranium reactors; management; materials; measuring instruments; monitoring; nuclear facilities; power plants; power reactorS; PWR type reactors; radiation detectors; radioactive materials; radioactive wastes; reactors; scintillation counters; standards; thermal power plants; thermal reactors; waste management; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 053002 -- Nuclear Fuels --Environmental Aspects -- Radioactive Effluents -- (1992-) 054000 -- Nuclear Fuels -- Health & Safety 055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E5200* -- Waste Disposal C5222 -- Environmental aspects of radioactive releases from fission fuel cycle facilities -- (1992-) E2300 -- Reactor Fuels F4000 -- Safeguards & Inspection

Citation 22

<DIALOG File 103: >
03312551 NOV-92-021302; EDB-92-086195
Title: Dry active waste segregation using a national nuclear waste sorting table
Author(s): Snead, P.B. (Carolina Power and Light Co., Brunswick Steam Electric Plant, Southport, NC (US))
Source: Radiation Protection Management (United States) v 4:6. Coden: RPMAE ISSN: 0740-0640
Publication Date: Nov 1987 p 53-58
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9212
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper reports that Carolina Power and Light Company's Brunswick Nuclear Project has been using a National Nuclear Corporation Model WST-18 Waste Sorting Table to monitor and sort dry active waste for the purpose of segregating uncontaminated material and recovering reusable items. The WST-18 features 18 large-area, solid scintillation detectors arranged in a 3 {times} 6 array underneath a sorting/monitoring surface that is shielded from background radiation. An eleven-week study at Brunswick showed that the use of the WST-18 resulted in dramatic improvements in both productivity and monitoring quality over the previous hand-prove frisking method. The WST-18 paid for its operation in volume reduction savings alone, without accounting for the additional savings from recovering reusable items.
Major Descriptors: *industrial wastes -- materials recovery; *nuclear industry -- materials recovery; *nuclear industry -- resource conservation; *radioactive wastes -- classification; *radioactive wastes -- separation processes
Descriptors: nuclear power plants; radioactive waste processing
Broader Terms: industry; management; materials; nuclear facilities; power plants; processing; radioactive materials;

radioactive waste management; recovery; thermal power plants; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing 052002 -- Nuclear Fuels -- Waste Disposal & Storage 320305 -- Energy Conservation, Consumption, & Utilization -- Industrial & Agricultural Processes -- Industrial Waste Management 055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E5100* -- Waste Treatment E5200 -- Waste Disposal F4000 -- Safeguards & Inspection

Citation 23

<DIALOG File 103: >
03312518 NOV-92-021333; EDB-92-086162
Title: Dry active waste management at nuclear power stations
Author(s): Bunker, A.S. (Techrite Co., Marietta, GA (US))
Source: Radiation Protection Management (United States) v 2:3. Coden: RPMAE ISSN: 0740-0640
Publication Date: Apr 1985 p 23-32
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9212
Subfile: ETD (Energy Technology Data Exchange). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: In February 1985, Radiation Protection Management conducted a survey of dry active waste (DAW) management practices at 21 nuclear power stations. This article presents the results of that survey in four main areas: material and area controls, waste segregation and sorting, waste processing, and radiological monitoring. The results of the survey indicated that DAW management practices were related to the volume of waste produced in the sense that high-volume waste generators tended to implement more measures to try to reduce the waste volumes shipped for disposal. The survey also revealed a mismatch between unrestricted release criteria and the survey methods used for monitoring and releasing trash for unrestricted disposal.
Major Descriptors: *nuclear power plants -- radiation protection laws; *nuclear power plants -- radioactive waste management; *nuclear power plants -- safety standards; *radiation monitoring -- planning; *radiation protection -- planning; *radiation protection -- surveys; *radioactive waste management -- radiation protection laws; *radioactive waste management -- safety standards; *radioactive wastes -- classification
Descriptors: dosimetry; radioactive waste processing; separation processes
BroaderTerms: laws; management; materials; monitoring; nuclear facilities; power plants; processing; radioactive materials; radioactive waste management; standards; thermal power plants; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 560190 -- Radiation Protection Standards -- (1992-) 560101 -- Biomedical Sciences, Applied Studies -- Radiation Effects -- Dosimetry & Monitoring -- (1992-)

Citation 24

<DIALOG File 103: >
03312512 EDB-92-086156
Title: DOE LLW classification rationale
Author(s)/Editor(s): Flores, A.Y.
Corporate Source: Idaho National Engineering Lab., Idaho Falls, ID (United States) (Code: 9502158)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: 16 Sep 1991 (19 p)
Report Number(s): INEL/MISC-91107
Order Number: DE92012222
Contract Number (DOE): AC07-76ID01570
Document Type: Report

Language: In English
Journal Announcement: EDB9212
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-902
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This report was about the rationale which the US Department of Energy had with low-level radioactive waste (LLW) classification. It is based on the Nuclear Regulatory Commission's classification system. DOE site operators met to review the qualifications and characteristics of the classification systems. They evaluated performance objectives, developed waste classification tables, and compiled dose limits on the waste. A goal of the LLW classification system was to allow each disposal site the freedom to develop limits to radionuclide inventories and concentrations according to its own site-specific characteristics. This goal was achieved with the adoption of a performance objectives system based on a performance assessment, with site-specific environmental conditions and engineered disposal systems.
Major Descriptors: *low-level radioactive wastes -- classification; *US DOE -- comparative evaluations; *US NRC -- comparative evaluations
Descriptors: dose limits; ground water; performance; radiation doses; radiation protection; radioactive waste management; radioisotopes; radionuclide migration; regulations; safety analysis; schedules; soils
Broader Terms: doses; environmental transport; evaluation; hydrogen compounds; isotopes; management; mass transfer; materials; national organizations; oxygen compounds; radioactive materials; radioactive wastes; safety standards; standards; waste management; wastes; water
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: E5000* -- Waste Management E2300 -- Reactor Fuels

Citation 25

<DIALOG File 103: >
03303761 EDB-92-066518
Title: Source term evaluation for performance assessment of LLW disposal
Author(s)/Editor(s): Cowgill, M.G.; Sullivan, T.M.
Corporate Source: Brookhaven National Lab., Upton, NY (United States) (Code: 0936000)
Sponsoring Organization: NRC Nuclear Regulatory Commission, Washington, DC (United States)
Conference Title: Waste management '92
Conference Location: Tucson, AZ (United States) Conference Date: 1-5 Mar 1992
Publication Date: 1992 (15 p)
Report Number(s): BNL-NUREG-45089 CONF-920307--48
Order Number: DE92010155
Contract Number (DOE): AC02-76CH00016
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9210
Availability: OSTI; NTIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-000
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Information compiled on the low-level radioactive waste disposed at the three currently operating commercial disposal sites during the period 1987--1989 have been reviewed and processed in order to determine the

total activity distribution in terms of waste stream, waste classification and waste form. The data from waste disposed during 1989 at one of the sites (Richland, WA) were more detailed than the data available during other years and at other sites, and thus were amenable to a more in-depth treatment. This included determination of the distribution of activity for each radionuclide by waste form, and thus enabled these data to be evaluated in terms of the specific needs for improved modeling of releases from waste packages.
Major Descriptors: *data -- evaluation; *low-level radioactive wastes -- radioactive waste disposal; *radioisotopes -- activity levels; *waste forms -- performance
Descriptors: data acquisition; source terms
Broader Terms: information; isotopes; management; materials; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 26

<DIALOG File 103: >
03284400 EDB-92-047157
Title: Industry considerations of concentration averaging
Author(s): Kaczmarsky, M.M. (Ebasco Services Incorporated, New York, NY (United States)); Tuite, P.T. (WMG, Inc., Montrose, NY (United States))
Title: Twelfth annual US DOE low-level waste management conference. Summary and proceedings
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 12. annual Department of Energy (DOE) low level waste management conference
Conference Location: Chicago, IL (United States) Conference Date: 28-29 Aug 1990
Publication Date: 1990 p 243-252 (336 p)
Report Number(s): CONF-9008119--
Order Number: DE91010020
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9208
Availability: OSTI; NTIS; INIS
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Disposal of low level radioactive waste (LLW) which meets the requirements of 10 CFR Part 61 for Class A, B, or C waste is currently permitted at commercial disposal facilities. Disposal packages containing metallic irradiated core components are typically classified Class B or C due to the high concentration of certain radionuclides. Should an individual component contain radionuclides that exceed Class C limitations, averaging of the component is permitted with the volume of the components contained within the same disposal package. Concentration averaging is utilized extensively to successfully dispose of irradiated hardware waste from nuclear power plants. Disposal of irradiated hardware waste at commercial low level radioactive waste disposal facilities accounts for the largest volume of Class C waste, as defined by 10 CFR Part 61,. Irradiated hardware waste shipments also contain the largest concentration of radioactivity when compared to all other low level waste shipments. A typical disposal liner may contain 10,000 to 20,000 curies and have a surface dose of a few thousand R/HR. The spent fuel pools at nuclear power plants were not typically designed to store large quantities of irradiated hardware waste. The impact on storage space for spent fuel therefore necessitates the removal and disposal of irradiated hardware waste. Different types of irradiated hardware waste are generated at commercial light water nuclear power plants and certain considerations are taken into account for the classification of these components to comply with 10 CFR Part 61. In addition, the concentration averaging alternative permitted by the disposal facility has a significant impact on the disposal of irradiated hardware waste components.
Major Descriptors: *bwr type reactors -- radioactive waste management; *low -level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *PWR type reactors -- radioactive waste

management
Descriptors: containers; control elements; fuel pools; liners; packaging; radiation doses; radiation protection; radioactive waste processing; spent fuels; volume
Broader Terms: doses; energy sources; enriched uranium reactors; fuels; management; materials; nuclear fuels; power reactors; processing; radioactive materials; radioactive waste management; radioactive wastes; reactor components; reactor materials; reactors; thermal reactors; waste disposal; waste management; waste processing; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 220900 -- Nuclear Reactor Technology -- Reactor Safety 210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled 210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
INIS Subject Categories: E5000* -- Waste Management E3100 -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types) E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)

Citation 27

<DIALOG File 103: >
03284379 EDB-92-047136
Title: Below regulatory concern rulemaking in Texas
Author(s): Pollard, C. (Texas Low-Level Radioactive Waste Disposal Authority, Austin (United States)); McBurney, R.E. (Texas Dept. of Health, Austin (United States))
Title: Twelfth annual US DOE low-level waste management conference. Summary and proceedings
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 12. annual Department of Energy (DOE) low level waste management conference
Conference Location: Chicago, IL (United States) Conference Date: 28-29 Aug 1990
Publication Date: 1990 p 229-242 (336 p)
Report Number(s): CONF-9008119--
Order Number: DE91010020
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9208
Availability: OSTI; NTIS; INIS
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission's (NRC) policy statement on below regulatory concern will have little impact on Texas. Texas has had a below regulatory concern policy since 1987. The Conference of Radiation Control Program Directors (Conference) developed a position paper on the NRC's policy which the Texas Radiation Control Program supports. The Texas Radiation Control Program agrees that there is a need for below regulatory concern rulemaking and supports the NRC effort in general. Exemption of products and practices whose future regulation would yield little gain in risk reduction is needed. In the area of naturally occurring radioactive materials, definition of a lower limit is needed to prevent the regulation of background radiation. However, Texas has reservations about exempting activities which would allow exposures up to 100 mrem to an individual. An individual dose equivalent in the range of 1-10 mrem per year seems more appropriate. This represents an associated risk of 10{sup {minus}7} to 10{sup {minus}6} which most experts hold to be of no concern. In May 1987, the Texas Radiation Control Program implemented a rule which allows the disposal of certain short-lived radioactive wastes without regard to radioactivity. A radioactive material license amendment is required before a licensee can use this disposal method. For example, a major medical institution saved $35,000 in disposal costs during 1989 using this disposal method. The institution was able to use alternative disposal methods for 1,600 ft{sup 3} of waste. The Texas Low-Level Radioactive Waste Disposal Authority projects that by 1993 all the major generators of short-lived

wastes in Texas will be utilizing this rulemaking.
Major Descriptors: *low-level radioactive wastes -- classification; *radioactive waste management -- regulations; *texas -- radioactive waste management
Descriptors: administrative procedures; alara; carbon 14; documentation; environmental exposure pathway; hazardous materials; implementation; inhalation; natural radioactivity; packaging; radiation doses; radiation protection; radioactive waste disposal; radioactive waste processing; risk assessment; sanitary landfills; transport; tritium; US EPA; US NRC
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; developed countries; doses; even-even nuclei; federal region VI; hydrogen isotopes; intake; isotopes; light nuclei; management; materials; national organizations; north america; nuclei; odd-even nuclei; processing; radioactive materials; radioactive waste management; radioactive wastes; radioactivity; radioisotopes; USA; waste disposal; waste management; waste processing; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 28

<DIALOG File 103: >
03275979 NOV-92-011482; EDB-92-038736
Title: Sensible classification of waste containing trace levels of radionuclides
Author(s): Casias, C.R. (Science Applications International Corp., Golden, CO (United States))
Title: 1992 TMS annual meeting (Abstracts)
Conference Title: Minerals, Metals, and Materials Society (TMS) annual meeting and exhibition
Conference Location: San Diego, CA (United States) Conference Date: 1-5 Mar 1992
Publisher: Warrendale, PA (United States) The Metallurgical Society Inc.
Publication Date: 1992 p C123 (vp.)
Report Number(s): CONF-920305--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9207
Availability: The Metallurgical Society Inc., 420 Commonwealth Dr., Warrendale, PA 15086 (United States)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: In this paper a basic methodology is presented (employing both standard and theoretical assessment, analysis, and data interpretation techniques) for classifying waste containing trace levels of radionuclides. Despite increased regulatory requirement for handling, transporting, and disposing of such waste: no formal characterization methodology has yet been implemented, and no limits have been set to define the point at which a waste material is considered to be low-level and below which it is below regulatory concern (BRC) or can be considered to contain no more than a diminimus level of radioactivity (i.e., is nonradioactive). The concept of diminimus limits specific to waste streams and waste forms is introduced, and a mechanism for evaluating waste in relation of BRC and diminimus limits is outlined. This methodology can be used to perform a complete and adequate characterization of waste for classification according to its level of radioactivity.
Major Descriptors: *radioactive waste disposal -- safeguard regulations; *radioactive wastes -- chemical composition; *radioactive wastes -- classification
Descriptors: low-level radioactive wastes; materials handling; transport; waste forms
Broader Terms: management; materials; radioactive materials; radioactive waste management; radioactive wastes; regulations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 054000 -- Nuclear Fuels -- Health & Safety

INIS Subject Categories: E5200* -- Waste Disposal F4000 -- Safeguards & Inspection F2400 -- Nuclear Law -- Transport & Storage of Radioactive Materials & Wastes E2300 -- Reactor Fuels

Citation 29

<DIALOG File 103: >
03223349 DEN-91-009198; EDB-91-150785
Title: Official publication of recommendations issued by the Reaktor-Sicherheitskommission (RSK). As of June 3, 1991. Recommendation concerning the operation of the Morsleben repository for radioactive waste (ERAM)
Original Title: Bekanntmachung von Empfehlungen der Reaktor-Sicherheitskommission (RSK). Vom 3. Juni 1991. Empfehlung zum Betrieb des Endlagers fuer radioaktive Abfaelle Morsleben (ERAM)
Corporate Source: Bundesministerium fuer Umwelt, Naturschutz und Reaktorsicherheit, Bonn (Germany) (Code: 9202276)
Source: Bundesanzeiger (Germany) v 43:137. Coden: BDZRA ISSN: 0344-7634
Publication Date: 28 Jul 1991 p 4885-4890
Document Type: Journal Article
Language: In German
Journal Announcement: EDB9123
Subfile: ETD (Energy Technology Data Exchange). DEN (Federal Republic of Germany (sent to DOE to from))
US DOE Project/NonDOE Project: NP
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: From the summarizing conclusions of the recommendation, the following statements have been selected for this abstract: Judging from the available data and experience, hazards emanating from the current operation of the repository can be excluded, as well as for the period licenced, which extends until June 30, 2000. The protective goals defined by the RSK safety criteria are judged to be fully guaranteed. The SRA committee of the Strahlenschutzkommission has expressed its approval of and agreement with the general assessment of the ERAM operation presented by the GRS. The RSK recommends to re-start operation of the repository and to continue with the storage of radioactive waste there. Otherwise, the waste in question would have to be stored at an interim storage site, where handling work may lead to an additional radiological burden. For the necessary backfitting of the Morsleben repository in order to achieve the standards applied in the licensing of new repositories in accordance with the state of art in science and technology, the RSK recommends the following measures to be taken, unless not already initiated: Improvement of the system for waste acceptance and recording (as e.g. nuclide-specific acceptance control, product control, documentation, waste classification); use of standard waste casks; optimization of backfilling methods; abandon in-situ solidification. (orig./HP).
Major Descriptors: *morsleben salt mine -- safety
Descriptors: environmental exposure pathway; federal republic of germany; intermediate-level radioactive wastes; low-level radioactive wastes; operating licenses; operation; quality control; radiation protection; radioactive waste disposal; reaktorsicherheitskommission; recommendations; retrofitting; salt caverns; site characterization; underground disposal; waste forms
Broader Terms: cavities; control; developed countries; Europe; German; French organizations; licenses; management; materials; national organizations; nuclear facilities; radioactive materials; radioactive waste facilities; radioactive waste management; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 30

<DIALOG File 103: >
03194867 EDB-91-122303
Title: Intruder scenarios for site-specific waste classification
Author(s): Kennedy, W.E. Jr. (Pacific Northwest Lab., Richland, WA (USA))
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 2: Site performance

assessment
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 55-64 (161 p)
Report Number(s): CONF-880839-Ses.2
Order Number: DE89005580
Contract Number (DOE): AC06-76RL01830
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The US Department of Energy (DOE) is currently revising its low-level radioactive waste (LLW) management requirements and guidelines for waste generated at its facilities that support defense missions. Specifically, draft DOE 5820.2A, Chapter 3, describes the purpose, policy, and requirements necessary for the management of defense LLW. The draft DOE policy calls for DOE LLW operations to be managed to protect the health and safety of the public, preserve the environment, and ensure that no remedial action will be necessary after termination of operations. The requirements and guidelines apply to radioactive wastes but are also intended to apply to mixed hazardous and radioactive wastes as defined in draft DOE 5400.5, Hazardous and Radioactive Mixed Waste. The basic approach used by DOE is to establish overall performance objectives in terms of ground-water protection and public radiation dose limits and to require site-specific performance assessments to determine compliance. As a result of these performance assessments, each site shall develop waste acceptance criteria that define the allowable quantities and concentrations of specific radioisotopes. Additional limitations on waste disposal design, waste form, and waste treatment shall also be developed on a site-specific basis. As a key step in the site-specific performance assessments, an evaluation must be conducted of potential radiation doses to intruders who may inadvertently move onto a closed DOE LLW disposal site after loss of institutional controls must be conducted. This paper describes the types of intruder scenarios that should be considered when performing this step of the site-specific performance assessment.

Major Descriptors: *low-level radioactive wastes -- radioactive waste management; *radioactive waste management -- radiation protection
Descriptors: compliance; ground water; hazardous materials; public health; radiation doses; radioactive waste disposal; radioactive waste processing; remedial action; US DOD; US DOE; waste forms
Broader Terms: doses; hydrogen compounds; management; materials; national organizations; oxygen compounds; processing; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; waste processing; wastes; water
Subject Categories: 054000* -- Nuclear Fuels -- Health & Safety 052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E2300* -- Reactor Fuels E5000 -- Waste Management

Citation 31

<DIALOG File 103: >
03194796 INS-91-024804; EDB-91-122232
Title: Use of IMPACTS-BRC (below regulatory concern) to calculate impacts from nuclear power plant BRC waste disposal
Author(s): Rogers, V.C.; Murphy, E.S. (Rogers Associates Engineering Corporation, Salt Lake City, UT (USA))
Conference Title: Winter meeting of the American Nuclear Society (ANS) and nuclear power and technology exhibit
Conference Location: San Francisco, CA (United States) Conference Date: 26-30 Nov 1989

Source: Transactions of the American Nuclear Society (United States) v 60. Coden: TANSA ISSN: 0003-018X
Publication Date: Nov 1989 p 509-510
Report Number(s): CONF-891103--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB9119
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The Electric Power Research Institute is providing support for a nuclear industry rulemaking petition to exempt certain very low level radioactive wastes from U.S. Nuclear Regulatory Commission regulation under the below-regulatory-concern (BRC) definition. Dose calculations are performed using a radionuclide distribution that is representative of the waste types proposed for BRC disposal. The calculations are performed for six treatment-and-disposal options proposed as alternatives for managing the reactor-generated waste types. The radiological impacts from the treatment and/or disposal of BRC wastes, as modeled in IMPACTS-BRC are proportional to the effective radionuclide concentration in the total BRC and nonradioactive waste volume. The individual impacts calculated by IMPACTS-BRC are determined by the total radionuclide inventory incinerated or disposed, rather than by the radionuclide concentration in the BRC waste.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *nuclear power plants --radioactive waste management
Descriptors: computer codes; data base management; hazardous materials; icodes; incinerators; radiation doses; transport; US NRC
Broader Terms: computer codes; doses; management; materials; national organizations; nuclear facilities; power plants; radioactive materials; radioactive waste management; radioactive wastes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 220900 -- Nuclear Reactor Technology -- Reactor Safety 220500 -- Nuclear Reactor Technology -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal C5200 -- Radiation Hazards & Environmental Safety Evaluations of Nuclear Installations

Citation 32

<DIALOG File 103: >
03194795 INS-91-024805; EDB-91-122231
Title: Industry petition for rulemaking on the disposal of below-regulatory-concern wastes
Author(s): Tipton, T.E. (Nuclear Management Resources Council, Washington, DC (USA))
Conference Title: Winter meeting of the American Nuclear Society (ANS) and nuclear power and technology exhibit
Conference Location: San Francisco, CA (United States) Conference Date: 26-30 Nov 1989
Source: Transactions of the American Nuclear Society (United States) v 60. Coden: TANSA ISSN: 0003-018X
Publication Date: Nov 1989 p 510
Report Number(s): CONF-891103--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB9119
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Management and Resources Council, Inc., in conjunction with the Edison Electric Institute, plans to submit a petition for rulemaking entitled Petition for Rulemaking Regarding Disposal of Below Regulatory Concern Wastes from commercial Nuclear Power Plants to the U.S. Nuclear Regulatory Commission (NRC). This petition for rulemaking, which is being filed pursuant to 10CFR2.802 and 10CFR2, Appendix B of the Code of

Federal Regulations, requests the NRC to promulgate a rule authorizing the treatment and disposal of low-level radioactive wastes (LLW) determined to be below regulatory conce- (BRC) in other than licensed LLW disposal facilities. The proposed rule will apply only to LLW generated at mmercial nuclear power plants. The petition is based on detailed scientific and technical data derived through an extensive research program conducted by the Electric Power Research Institute, Inc. It addresses the 14 decision criteria that the NRC will employ in judging whether to grant the petition. The petition also provides an environmental assessment and finding of no significant impact and regulatory analysis. The purpose of the environmental assessment is to discuss alternatives, consequences, and impacts analyzed to support the recommendation of the proposed rule. The regulatory analysis addresses the need for and consequences of the proposed regulatory action as it relates to the protection of public health and safety.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *nuclear power plants -- radioactive waste management
Descriptors: documentation; electric utilities; EPRI
EPRI; gamma radiation; hazardous materials; implementation; radiation hazards; regulations; sanitary landfills; US NRC
Broader Terms: Electromagnetic radiation; hazards; health hazards; ionizing radiations; management; materials; national organizations; nuclear facilities; power plants; public utilities; radiations; radioactive materials; radioactive waste management; radioactive wastes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 220500 -- Nuclear Reactor Technology -- Environmental Aspects 220900 -- Nuclear Reactor Technology -- Reactor Safety
INIS Subject Categories: E5200* -- Waste Disposal C5200 -- Radiation Hazards & Environmental Safety Evaluations of Nuclear Installations

Citation 33

<DIALOG File 103: >
03194766 EDB-91-122202
Title: Development of EPA's (Environmental Protection Agency) BRC (below regulatory concern) criteria for the disposal of low-level radioactive waste
Author(s): Gruhlke, J.M.; Galpin, F.L.; Holcomb, W.F. (Environmental Protection Agency, Washington, DC (USA))
Conference Title: Winter meeting of the American Nuclear Society (ANS) and nuclear power and technology exhibit
Conference Location: San Francisco, CA (United States) Conference Date: 26-30 Nov 1989
Source: Transactions of the American Nuclear Society (United States) v 60. Coden: TANSA ISSN: 0003-018X
Publication Date: Nov 1989 p 507
Report Number(s): CONF-891103--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB9119
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The Environmental Protection Agency (EPA) program to develop proposed generally applicable environmental standards for land disposal of low-level radioactive waste (LLW) and certain naturally occurring and accelerator-produced radioactive wastes has been completed. The elements of the proposed standards for LLW under 40CFR193 of the Code of Federal Regulations include the following: 1. exposure limits for predisposal management and storage operations; 2. criteria for other regulatory agencies to follow in specifying wastes that are below regulatory concern (BRC); 3. postdisposal exposure limits; 4. groundwater protection requirements; and 5. qualitative implementation requirements. This paper focuses on the development of EPA's BRC criteria applicable to the disposal of LLW.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal

Descriptors: ALARA; economics; ground water; hazardous materials; human populations; implementation; incinerators; municipal wastes; occupation al exposure; public health; radiation doses; regulations; resource recovery acts; risk assessment; sanitary landfills; US DOE; US EPA; US NRC
Broader Terms: doses; hydrogen compounds; laws; management; materials; national organizations; oxygen compounds; populations; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; wastes; water
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 34

<DIALOG File 103: >
03194763 EDB-91-122199
Title: Comprehensive implementation plan for the DOE defense buried TRU-contaminated waste program
Author(s)/Editor(s): Everette, S.E.; Detamore, J.A.; Raudenbush, M.H.; Thieme, R.E.
Corporate Source: USDOE Joint Integration Office, Albuquerque, NM (United States) (Code: 9520304)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: Feb 1988 (444 p)
Report Number(s): DOE/JIO-025
Order Number: DE91018488
Document Type: Report
Language: In English
Journal Announcement: EDB9119
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-902
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: In 1970, the US Atomic Energy Commission established a transuranic'' (TRU) waste classification. Waste disposed of prior to the decision to retrievably store the waste and which may contain TRU contamination is referred to as buried transuranic-contaminated waste'' (BTW). The DOE reference plan for BTW, stated in the Defense Waste Management Plan, is to monitor it, to take such remedial actions as may be necessary, and to re-evaluate its safety as necessary or in about 10-year periods. Responsibility for management of radioactive waste and byproducts generated by DOE belongs to the Secretary of Energy. Regulatory control for these sites containing mixed waste is exercised by both DOE (radionuclides) and EPA (hazardous constituents). Each DOE Operations Office is responsible for developing and implementing plans for long-term management of its radioactive and hazardous waste sites. This comprehensive plan includes site-by-site long-range plans, site characteristics, site costs, and schedules at each site. 13 figs., 15 tabs.
Major Descriptors: *alpha-bearing wastes -- radioactive waste disposal; *environment -- monitoring; *radioactive waste facilities -- program management
Descriptors: contamination; cost; hazardous materials; planning; radiation hazards; radionuclide migration; remedial action; safety; schedules; site characterization; soils; underground disposal; US DOE; waste forms; waste transportation
Broader Terms: environmental transport; hazards; health hazards; management ; mass transfer; materials; national organizations; nuclear facilities; radioactive materials; radioactive waste management; radioactive wastes; transport; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 35

<DIALOG File 103: >
03194743 INS-91-024788; EDB-91-122179
Title: NRC's (Nuclear Regulatory Commission) activities relating to the regulation of very low levels of radiation and radioactivity
Author(s): Davis, J.P. (General Physics Corporation, San Diego, CA (USA))
of Conference Title: Winter meeting the American Nuclear Society (ANS) and nuclear power and technology exhibit
Conference Location: San Francisco, CA (United States) Conference Date: 26-30 Nov 1989
Source: Transactions of the American Nuclear Society (United States) v 60. Coden: TANSA ISSN: 0003-018X
Publication Date: Nov 1989 p 507-508
Report Number(s): CONF-891103--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB9119
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper presents a timely review of developments relating to the U.S. Nuclear Regulatory Commissions's (NRC's) approach to regulation (or nonregulation) of very low levels of radiation (i.e., those substantially below the allowable public exposure limits of 10CFR20 of the Code of Federal Regulations) of radioactivity and of quantities or concentrations of radioactive materials.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: ALARA; decision making; licensing; radiation doses; radiation protection; regulations; risk assessment; US NRC
Broader Terms: doses; management; materials; national organizations; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 36

<DIALOG File 103: >
03194679 EDB-91-122115
Title: Issues in Canadian LLRW management
Author(s): Charlesworth, D.H. (Atomic Energy of Canada Limited, Chalk River, Ontario (Canada))
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 3: Disposal technology and facility development
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 82-89 (105 p)
Report Number(s): CONF-880839-Ses.3
Order Number: DE89005581
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input).
JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: Canada

Country of Publication: United States
Abstract: Some of the issues which are of concern in Canada are similar to those being discussed in the US because Canadian low-level radioactive waste (LLRW) production is similar in quantity and characteristics to that which will be handled by some state compacts. This paper gives a Canadian viewpoint of: the choice between interim storage and permanent disposal; the importance of considering inadvertent intrusion; the role of waste categorization and stability; and the concerns in assessing disposal performance. The discussion is related to Atomic Energy of Canada Limited's LLRW disposal program, and its approach to resolving these issues.
Major Descriptors: *canada -- radioactive waste management; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: classification; computer codes; decision making; hazardous materials; planning; radioactive waste facilities; radionuclide migration; storage; validation
Broader Terms: developed countries; environmental transport; management; mass transfer; materials; North America; nuclear facilities; radioactive materials; radioactive waste management; radioactive wastes; testing; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 37

<DIALOG File 103: >
03194678 EDB-91-122114
Title: Status report on NRC's current below regulatory concern activities
Author(s): Dragonette, K.S. (Nuclear Regulatory Commission, Washington, DC (USA))
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 1: Institutional and regulatory issues
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 30-33 (100 p)
Report Number(s): CONF-880839-Ses.1
Order Number: DE89005574
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The concept of below regulatory concern (BRC) is not new to the Nuclear Regulatory Commission (NRC) or its predecessor agency, the Atomic Energy Commission. The regulations and licensing decisions have involved limited and de facto decisions on BRC since the beginning. For example, consumer products containing radioactive materials have been approved for distribution to persons exempt from licensing for some time and procedures for survey and release of equipment have traditionally been a part of many licensees' radiation safety programs. However, these actions have generally been ad hoc decisions in response to specific needs and have not been necessarily consistent. The need to deal with this regulatory matter has been receiving attention from both Congress and the NRC Commissioners. NRC response has grown from addressing specific waste streams, to generic rulemaking for wastes, and finally to efforts to develop a broad generic BRC policy. Section 10 of the Low-Level Radioactive Waste Policy Amendments Act of 1985 addressed NRC actions on specific waste streams. In response, NRC issued guidance on rulemaking petitions for specific wastes. NRC also issued an advance notice of proposed rulemaking indicating consideration of Commission initiated regulations to address BRC wastes in a generic manner. The Commissioners have directed staff to develop an umbrella policy for all agency decisions concerning levels of

risk or dose that do not require government regulation.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: ALARA; computer codes; decision making; licensing; nuclear waste policy acts; radiation protection; radioactive waste disposal; radioactive waste processing; US NRC
Broader Terms: laws; management; materials; national organizations; processing; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 38

<DIALOG File 103: >
03194677 EDB-91-122113
Title: Considerations in the development of EPA's proposed BRC criteria
Author(s): Holcomb, W.F.; Gruhlke, J.M.; Galpin, F.L. (Environmental Protection Agency, Washington, DC (USA))
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 1: Institutional and regulatory issues
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 21-29 (100 p)
Report Number(s): CONF-880839-Ses.1
Order Number: DE89005574
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: To support the concept of criteria for potential below-regulatory-concern (BRC) wastes the US Environmental Protection Agency (EPA) has developed technical information, cost data, a methodology for analyzing promising candidate waste streams, and a rationale for proposing the criteria. Risk assessments to support the BRC criteria include an analysis of surrogate radioactive waste streams, disposal alternatives, and diverse demographic settings. In arriving at a proposed BRC level, EPA carefully weighed and considered many factors. Foremost was protection of the public and the development of an exposure level with assurance of no undue risk. Also considered were other daily risks encountered, ability to demonstrate compliance, guidance for similar exemptions by other groups, consistency with other regulated risk levels, general population health risks, maximum annual exposures to critical population groups, and the costs presently associated with the regulation of these wastes.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: accuracy; ALARA; compliance; cost benefit analysis; environmental exposure pathway; ground water; implementation; public health; radi ation protection; radioactive waste disposal; radioactive waste processing; regulations; risk assessment; source terms; US DOE; US EPA; US NRC
Broader Terms: economic analysis; economics; hydrogen compounds; management ; materials; national organizations; oxygen compounds; processing; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; waste processing; wastes; water
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 39

<DIALOG File 103: >
03194676 EDB-91-122112
Title: A utility perspective on BRC
Author(s): Farrell, B.
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 1: Institutional and regulatory issues
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 16-20 (100 p)
Report Number(s): CONF-880839-Ses.1
Order Number: DE89005574
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The author is program manager for low-level radioactive waste (LLW) for the Utility Nuclear Waste Management Group (UNWMG), an activity funded by 45 utilities with nuclear power programs. The UNWMG represents the utility industry on high-level and low-level radioactive waste issues in legislative, regulatory, and technical proceedings, and therefore has a strong interest in the progress of below-regulatory-concern (BRC) regulations. The author addresses waste disposal volumes prior to discussing recent developments and status of BRC regulations.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: electric utilities; legal aspects; nuclear waste policy acts; radiation protection; radioactive waste disposal; radioactive waste processing; regulations
Broader Terms: laws; management; materials; processing; public utilities; radioactive materials; radioactive waste management; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 40

<DIALOG File 103: >
03194675 EDB-91-122111
Title: Current status of the development of international exemption principles
Author(s): Kennedy, W.E. Jr. (Pacific Northwest Lab., Richland, WA (USA))
Title: Proceedings of the tenth annual DOE low-level waste management conference. Session 1: Institutional and regulatory issues
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (United States) (Code: 9507781)
Conference Title: 10. annual Department of Energy (DOE) low-level waste management conference
Conference Location: Denver, CO (United States) Conference Date: 30 Aug - 1 Sep 1988
Publication Date: Dec 1988 p 9-15 (100 p)
Report Number(s): CONF-880839-Ses.1
Order Number: DE89005574

Contract Number (DOE): AC06-76RL01830
Document Type: Analytic of a Report; Conference Literature
Language: In English
Journal Announcement: EDB9119
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: For the past several years, the International Atomic Energy Agency (IAEA) has been investigating the possibility of exempting certain radiation sources and practices from regulatory control. Initial efforts were conducted under the general heading of de minimis. Interest in this topic arises from international recognition that a significant fraction of the wastes from industry, research, medicine, and the nuclear fuel cycle are contaminated to such low levels that applying regulatory controls may be unwarranted. The IAEA evaluation has been conducted by Advisory Groups considering two interrelated topics: to establish principles for exemption, and to apply the principles to various areas of waste management. The IAEA Advisory Groups developed the criteria from modeled assessments of the potential radiation exposure pathways and scenarios for individuals and population groups following the unrestricted release of radioactive materials. Although the scenarios and models used by the IAEA are necessarily generic, consultants to the Advisory Groups attempted to identify the most important radiation exposure pathways based on available literature. This approach is intended to provide the basic framework for the numerical derivation of generic exempt quantities that would be conservative in most situations. This paper discusses the current status of the IAEA's efforts on the subject of exemption and presents the generic results expressed as overall exemption limits for municipal wastes and materials for recycle and reuse.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: Battelle pacific northwest laboratories; environmental exposure pathway; IAEA; NEA; nuclear medicine; radiation doses; radiation protection; radioactive waste disposal; radioactive waste processing; regulations; research programs
Broader Terms: doses; international organizations; management; materials; medicine; national organizations; OECD; processing; radioactive materials; radioactive waste management; radioactive wastes; US DOE; US ERDA; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 41

<DIALOG File 103: >
03194673 INS-91-024758; EDB-91-122109
Title: Solid low-level waste certification strategy
Author(s)/Editor(s): Smith, M.A.
Corporate Source: Oak Ridge National Lab., TN (United States) (Code: 4832000)
Sponsoring Organization: DOE USDOE, Washington, DC (United States)
Publication Date: Aug 1991 (26 p)
Report Number(s): ORNL/TM-11307
Order Number: DE91017172
Contract Number (DOE): AC05-84OR21400
Document Type: Report
Language: In English
Journal Announcement: EDB9119
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-407
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input);

NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The purpose of the Solid Low-Level Waste (SLLW) Certification Program is to provide assurance that SLLW generated at the ORNL meets the applicable waste acceptance criteria for those facilities to which the waste is sent for treatment, handling, storage, or disposal. This document describes the strategy to be used for certification of SLLW or ORNL. The SLLW Certification Program applies to all ORNL operations involving the generation, shipment, handling, treatment, storage and disposal of SLLW. Mixed wastes, containing both hazardous and radioactive constituents, and transuranic wastes are not included in the scope of this document. 13 refs., 3 figs.
Major Descriptors: *low-level radioactive wastes -- classification; *ornl - radioactive waste management
Descriptors: administrative procedures; ALARA; compliance; constraints; environmental policy; industrial radiography; minimization; nondestructive testing; quality assurance; resource recovery acts; solid wastes
Broader Terms: government policies; laws; management; materials; materials testing; national organizations; radioactive materials; radioactive wastes; testing; US AEC; US DOE; US ERDA; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 42

<DIALOG File 103: >
03160867 EDB-91-098303
Title: Sources, classification, and disposal of radioactive wastes: History and legal and regulatory requirements
Author(s)/Editor(s): Kocher, D.C.
Corporate Source: Oak Ridge National Lab., TN (United States) (Code: 4832 000)
Sponsoring Organization: DOE USDOE, Washington, DC (USA)
Conference Title: Management and disposal of radioactive wastes
Conference Location: Boston, MA (United States) Conference Date: 15-19 Jul 1991
Publication Date: 1991 (81 p)
Report Number(s): CONF-9107137-1
Order Number: DE91015272
Contract Number (DOE): AC05-84OR21400
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9116
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-400; MN-407
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This report discusses the following topics: (1) early definitions of different types (classes) of radioactive waste developed prior to definitions in laws and regulations; (2) sources of different classes of radioactive waste; (3) current laws and regulations addressing classification of radioactive wastes; and requirements for disposal of different waste classes. Relationship between waste classification and requirements for permanent disposal is emphasized; (4) federal and state responsibilities for radioactive wastes; and (5) distinctions between radioactive wastes produced in civilian and defense sectors.
Major Descriptors: *radioactive waste management -- historical aspects; *radioactive waste management -- legal aspects
Descriptors: laws; liquid wastes; nuclear waste policy acts; radioactive wastes; radioactivity; regulations; solid wastes
Broader Terms: laws; management; materials; radioactive materials; waste management; wastes

Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 43

<DIALOG File 103: >
03143838 AIX-22-048031; EDB-91-081274
Title: Order of President of National Atomic Energy Agency of 19 May 1989 concerning rules of counting wastes to radioactive wastes as well as their classification and recording likewise requirements of their neutralization, storage and disposal
Original Title: Zarzadzenie Prezesa Panstwowej Agencji Atomistyki z dnia 19 maja 1989 r. w sprawie zasad zaliczania odpadow promieniotworczych oraz ich kwalifikowania i ewidencjonowania, a takze warunkow ich unieszkodliwiania, przechowywania i skladowania
Source: Monitor Polski (Poland) v 18. Coden: MOPOE
Publication Date: 1989 p 239-244
Document Type: Journal Article; Legislative Material
Language: In Polish
Journal Announcement: EDB9113
Subfile: ETD (Energy Technology Data Exchange). INIS (non-US Atomindex input AIX)
US DOE Project/NonDOE Project: NP
Country of Origin: Poland
Country of Publication: Poland
Abstract: The rules of counting wastes to radioactive one are determined. The wastes classification is given. Recording of information about wastes is stricly regulated. The order determines also all requirements of neutralization, storage and disposal of radioactive wastes. 3 tabs. (A.S.).
Major Descriptors: *Poland -- waste management; *radioactive wastes -- waste management
Descriptors: dose limits; legislative text; radioactive waste disposal; radioactive waste processing; radioactive waste storage; recording systems; waste forms
Broader Terms: developing countries; eastern europe; europe; management; materials; processing; radioactive materials; safety standards; standards ; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 056000* -- Nuclear Fuels -- Legislation & Regulations -- (1987-)

Citation 44

<DIALOG File 103: >
03140054 EDB-91-077489
Title: Comparisons of radioactive and chemical wastes
Author(s): Martin, J.E. (Univ. of Michigan, Ann Arbor (USA))
Source: Hazardous Waste and Hazardous Materials (USA) v 5:1. Coden: HWHME ISSN: 0882-5696
Publication Date: Win 1988 p 73-84
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9112
Subfile: EPA (Energy Abstracts for Policy Analysis); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Radioactive and chemical wastes represent a wide range of technical and policy issues, with numerous similarities and differences. The transfer of information from one to guide control decisions and policies for the other has been minimal perhaps because of perspective. Study of the features of these two waste categories indicates that

radioactive waste management could profit from the siting and waste categorization approaches used for chemical wastes; industrial waste management could profit from the experience base developed for radioactive wastes on approaches used in risk assessment, control of bulk wastes, and use of geologic isolation for highly toxic wastes.
Major Descriptors: *chemical wastes -- waste management; *radioactive wastes --radioactive waste management
Descriptors: comparative evaluations; decision making; environmental policy
Broader Terms: government policies; management; materials; radioactive materials; waste management; wastes
Subject Categories: 540330* -- Environment, Aquatic -- Radioactive Materials Monitoring & Transport -- (1990-) 540230 -- Environment, Terrestrial -- Radioactive Materials Monitoring & Transport -- (1990-) 290300 -- Energy Planning & Policy -- Environment, Health, & Safety
INIS Subject Categories: B3200* -- Water B3110 -- Radioactive materials monitoring & transport

Citation 45

<DIALOG File 103: >
03123577 EDB-91-061012
Title: Summary and status of TRU waste characterization
Author(s)/Editor(s): Drez, P.E.; Devarakonda, M.
Corporate Source: I. T. Corp., Albuquerque, NM (USA) (Code: 9526006)
Sponsoring Organization: DOE USDOE, Washington, DC (USA)
Conference Title: Waste management '91
Conference Location: Tucson, AZ (USA) Conference Date: 24-28 Feb 1991
Publication Date: 1991 (10 p)
Report Number(s): DOE/WIPP-90-022C CONF-910270--45
Order Number: DE91011458
Contract Number (DOE): AC04-86AL31950
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9111
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-721
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (TechnicalInformation Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, is a nuclear repository designed for the disposal of transuranic (TRU) wastes generated and/or stored at Department of Energy (DOE) facilities across the country. Characterization of the TRU waste is an integral part of showing compliance with regulations governing its transportation to the WIPP and subsequent storage and disposal at the WIPP. Available waste characterization information for the TRU wastes has been compiled and presented in various documents including the TRUPACT-II Safety Analysis Report, and the WIPP No-Migration Variance Petition. The waste characterization information is primarily based on process knowledge, supplemented with limited sampling and analytical data. This paper summarizes the available waste characterization information for the TRU waste in the DOE system, and the basis for classifying the waste under a uniform system across all DOE sites. 8 refs., 1 fig., 3 tabs.
Major Descriptors: *alpha-bearing wastes -- classification; *regulations --compliance
Descriptors: containers; hydrogen; organic compounds; radioactive waste disposal; sampling; sludges; US DOE; waste forms; waste transportation; WIPP
Broader Terms: elements; functional models; management; materials; national organizations; nonmetals; nuclear facilities; pilot plants; radioactive materials; radioactive waste facilities; radioactive wastes; transport; underground facilities; US DOE; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 050900 -- Nuclear Fuels -- Transport, Handling, & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 46

<DIALOG File 103: >
03123483 INS-91-012956; EDB-91-060918
Title: Low-level radioactive waste classification, waste form stability, failure mechanisms, and radionuclide releases
Author(s): Reed, P.R.
Title: Transactions of the eighteenth water reactor safety information meeting
Author(s)/Editor(s): Weiss, A.J. (comp.)
Corporate Source: Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Regulatory Research (Code: 9503688)
Publication Date: Oct 1990 p 12.9-12.10 (211 p)
Report Number(s): NUREG/CP-0113
Order Number: TI91000893
Document Type: Analytic of a Report
Language: In English
Journal Announcement: EDB9111
Availability: OSTI; GPO
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Regulation of low-level radioactive waste (LLW) disposal facilities requires that the NRC staff have an understanding of the complex scientific and technical variables associated with classifying LLW for radionuclide and chemical content and ensuring the waste forms produced by the nuclear power stations and disposed in licensed burial sites maintain stability for at least 300 years. This research paper discusses the low-level radioactive research plan for conducting research on issues of concern to the U.S. Nuclear Regulatory Commission associated with LLW classification, waste form stability, failure mechanisms of waste forms, radionuclide and chemical releases from cement solidified waste forms, and past experiences involving unsuccessful cement solidification of radwaste. The topics discussed include the regulatory need for performing the research studies, research strategies, current research activities, applications of the research results to NRC's licensing and regulatory environment, and new research studies expected to begin in FY91.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- waste forms
Descriptors: cements; chemical composition; containers; decontamination; failures; half-life; ion exchange; leaching; licensing; nuclear power plants; public health; quantity ratio; radiation protection; radioactive waste disposal; radioactive waste facilities; research programs; resins; safety; scaling laws; solidification; stabilitY; US NRC
Broader Terms: building materials; cleaning; dissolution; management; materials; national organizations; nuclear facilities; organic compounds; organic polymers; petrochemicals; petroleum products; phase transformations; polymers; power plants; radioactive materials; radioactive wastes; separation processes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 47

<DIALOG File 103: >
03123481 INS-91-012954; EDB-91-060916
Title: US Nuclear Regulatory Commission's Policy statement on below regulatory concern
Author(s): Cool, D.A.
Title: Transactions of the eighteenth water reactor safety information meeting
Author(s)/Editor(s): Weiss, A.J. (comp.)

Corporate Source: Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Regulatory Research (Code: 9503688)
Publication Date: Oct 1990 p 3.1 (211 p)
Report Number(s): NUREG/CP-0113
Order Number: TI91000893
Document Type: Analytic of a Report
Language: In English
Journal Announcement: EDB9111
Availability: OSTI; GPO
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The United States Nuclear Regulatory Commission has developed a policy statement on Below Regulatory Concern (BRC) which will serve to establish a framework for future rulemaking and licensing decisions exempting certain activities involving radioactive material from regulatory control on the basis that the risks are so small that further efforts to reduce them are not warranted. The policy is also intended to allow the NRC, Agreement States, and licensees to focus their resources toward addressing more significant risks from radioactive materials. The policy statement does not, in itself, exempt any materials from regulatory control, but will serve as a framework for potential applications such as release of formerly utilized sites for unrestricted public use, exempt distribution of consumer products containing small quantities of radioactive material, the disposal of very low-level radioactive waste, and the recycle or reuse of slightly contaminated equipment and materials. The policy will contain numerical criteria for both individual and collective dose which will define when further efforts to reduce dose from a practice are not necessary in keeping with the ALARA concept. The policy will also describe the NRC plans for implementation of the policy, and outline some of the information that would be necessary to support a request for exemption of a practice.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management
Descriptors: ALARA; contamination; implementation; radiation doses; radiation protection; radioactive materials; reactor components; regulations; remedial action; US NRC
Broader Terms: doses; management; materials; national organizations; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 48

<DIALOG File 103: >
02987702 EDB-91-021325; INS-91-004410; ERA-16-007502
Title: Radionuclide characterization of reactor decommissioning waste and spent fuel assembly hardware
Author(s)/Editor(s): Robertson, D.E.; Thomas, C.W.; Wynhoff, N.L.; Hetzer, D.C. (Pacific Northwest Lab., Richland, WA (USA))
Corporate Source: Nuclear Regulatory Commission, Washington, DC (USA). Div. of Regulatory Applications Pacific Northwest Lab., Richland, WA (USA) (Code: 9521361; 9512268)
Sponsoring Organization: NRC
Publication Date: Jan 1991 (101 p)
Report Number(s): NUREG/CR-5343 PNL--6806
Order Number: TI91007071
Contract Number (DOE): AC06-76RL01830
Document Type: Report; Progress Report
Language: In English
Journal Announcement: EDB9104
Availability: OSTI; NTIS; INIS; GPO

Distribution: (Report):0 (MF):6 MN-000
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This study is providing the NRC and licensees with a more comprehensive and defensible data base and regulatory assessment of the radiological factors associated with reactor decommissioning and disposal of wastes generated during these activities. The objectives of this study are being accomplished during a two-phase sampling, measurement, and assessment program involving the actual decommissioning of Shippingport Station and the detailed analysis of neutron-activated materials from commercial reactors. Radiological characterization studies at Shippingport have shown that neutron activation products, dominated by {sup 60}Co, comprised the residual radionuclide inventory. Fission products and transuranic radionuclides were essentially absent. Waste classification assessments have shown that all decommissioning materials (except reactor pressure vessel internals) could be disposed of as Class A waste. Measurements and assessments of spent fuel assembly hardware have shown that {sup 63}Ni, {sup 59}Ni, and {sup 94}Nb sometimes greatly exceed the 10CFR61 Class C limit for some components, and thus would require disposal in a high level waste repository. These measurements are providing the basis for an assessment of the disposal options for these types of highly radioactive materials. Comparisons of predicted (calculated) activation product concentrations with the empirical data are providing as assessment of the accuracy of calculational methods. Work is continuing on radiological characterization of spent PWR and BWR control rod assemblies. Additional work is planned on current issues/problems relating to reactor decommissioning. These efforts will be reported on in future supplements to this report. 20 refs., 23 figs., 34 tabs.
Major Descriptors: *bwr type reactors -- reactor decommissioning; *low-level radioactive wastes -- radioactive waste disposal; *PWR type reactors -- reactor decommissioning
Descriptors: cobalt 60; control elements; nickel 59; nickel 63; niobium 94; progress report; radioisotopes; reactor components; reactor safety; Shippingport reactor; spent fuels
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; cobalt isotopes; decommissioning; document types; electron capture radioisotopes; energy sources; enriched uranium reactors; even-odd nuclei; fuels; intermediate mass nuclei; internal conversion radioisotopes; isomeric transition isotopes; isotopes; management; mate rials; minutes living radioisotopes; nickel isotopes; niobium isotopes; nuclear fuels; nuclei; odd-odd nuclei; power reactors; pwr type reactors; radioactive materials; radioactive wastes; radioisotopes; rea ctor components; reactor materials; reactors; safety; thermal reactors; waste disposal; waste management; wastes; water cooled reactors; water moderated reactors; years living radioisotopes
Subject Categories: 220900* -- Nuclear Reactor Technology -- Reactor Safety 210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled 210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled 052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E3100* -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types) E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types) E5200 -- Waste Disposal

Citation 49

<DIALOG File 103: >
02986878 EDB-91-020500; NTS-91-008417; INS-91-004447; ERA-16-007210
Title: Use of liquid scintillation in the appraisal of non-radioactive waste shipments from nuclear facilities
Author(s)/Editor(s): McDowell, W.L.
Corporate Source: Westinghouse Savannah River Co., Aiken, SC (USA) (Code: 9525316)
Sponsoring Organization: DOE/DP
Conference Title: International conference on new trends in liquid scintillation counting and organic scintillators
Conference Location: Gatlinburg, TN (USA) Conference Date: 2-5 Oct 1989
Publication Date: 1989 (10 p)
Report Number(s): WSRC-RP-89-387 CONF-891082--4
Order Number: DE91004330

Contract Number (DOE): AC09-89SR18035
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9104
Availability: OSTI; NTIS; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-701
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: On the Savannah River Site (SRS), non-radioactive or clean waste, is normally assayed to appraise the extent of surface contamination by using a survey meter. Because of the nature of the operations conducted at SRS, the majority of the waste generated is treated as contaminated waste until proven otherwise. Before such waste can be shipped off-site, more rigorous assay must demonstrate compliance with government standards. In particular, it is necessary to appraise the samples with regard to the Department of Transportation (DOT) guideline for a total activity of 2 nanoCuries per gram of waste material. Furthermore, the assay methods must be sufficient to comply with Environmental Protection Agency (EPA) regulations to prevent overcrowding of waste storage locations. Thus, the present work developed efficient liquid scintillation methods for meeting these requirements. The method of phase separation, sample processing, and liquid scintillation analysis proved effective for the analysis of mixed phase, hydrocarbon based waste samples. The described method was readily applicable to a variety of circumstances and was straightforward enough to be used by staff analysts after a minimum of training. The results were obtained in far shorter time (usually less than 2 hours for a single sample) than would be required for other typical methods of analysis. All samples analyzed by the methods presented were found to have activities below the 2 nCi/g DOT guideline for shipment of non-nuclear waste. 5 refs., 3 figs., 1 tab.
Major Descriptors: *liquid scintillation detectors -- performance; *low-level radioactive wastes -- classification; *organic wastes -- activity levels; *savannah river plant -- waste management
Descriptors: combustion; compliance; containers; efficiency; hazardous materials; high-purity GE detectors; ionizing radiations; liquid wastes; paints; regulations; sample preparation; sensitivity; solvents; surface contamination; training; transport; tritium; US DOE; US DOT; US EPA
Broader Terms: beta-minus decay radioisotopes; chemical reactions; coatings; contamination; ge semiconductor detectors; hydrogen isotopes; isotopes; light nuclei; management; materials; measuring instruments; national organizations; nuclei; odd-even nuclei; oxidation; radiation detectors; radiations; radioactive materials; radioactive wastes; radioisotopes; scintillation counters; semiconductor detectors; thermochemical processes; US AEC; US DOE; US ERDA; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 440101 -- Radiation Instrumentation -- General Detectors or Monitors & Radiometric Instruments
INIS Subject Categories: E5000* -- Waste Management E4140 -- Other particle & radiation detection & measuring instruments

Citation 50

<DIALOG File 103: >
02975964 EDB-91-009588; INS-91-001749; ERA-16-007172
Title: Characteristics of low-level radioactive waste disposed during 1987--1989 (Richland, Barnwell, and Beatty Facilities.)
Author(s)/Editor(s): Roles, G.W.
Corporate Source: Nuclear Regulatory Commission, Washington, DC (USA). Div. of Low-Level Waste Management and Decommissioning (Code: 9522682)
Sponsoring Organization: NRC
Publication Date: Dec 1990 (622 p)
Report Number(s): NUREG-1418
Order Number: TI91005500

Document Type: Report; Numerical Data
Language: In English
Journal Announcement: EDB9102
Availability: OSTI; NTIS; INIS; GPO
Distribution: (Report):0 (MF):6 MN-000
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). TIC (Technical Information Center)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This report presents the volume, activity, and radionuclide distributions in low-level radioactive waste (LLW) disposed during 1987 through 1989 at the commercial disposal facilities located near Barnwell, SC, Richland, WA, and Beatty, NV. The report has been entirely assembled from descriptions of waste provided in LLW shipment manifests. Individual radionuclide distributions are listed as a function of waste class, of general industry, and of waste stream. In addition, information is presented about disposal of wastes containing chelating agents, about use of solidification media, about the distribution of radiation levels at the surfaces of waste containers, and about the distribution of waste container sizes. Considerably more information is presented about waste disposed at the Richland and Beatty disposal facilities than at the Barnwell disposal facility.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste facilities -- radioactive waste disposal
Descriptors: compiled data; containers; educational facilities; electric utilities; hospitals; industry; radiation monitoring; radioisotopes; solidification; volume
Broader Terms: buildings; data; information; isotopes; management; materials; medical establishments; monitoring; nuclear facilities; numerical data; phase transformations; public utilities; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 51

<DIALOG File 103: >
02967455 EDB-91-001080; NTS-91-004639; INS-91-001084; ERA-16-003695
Title: Matrix effects of TRU (transuranic) assays using the SWEPP PAN assay system
Author(s)/Editor(s): Smith, J.R.
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (USA) (Code: 9507781)
Sponsoring Organization: DOE/NE
Publication Date: Aug 1990 (117 p)
Report Number(s): EGG-PHY-9204
Order Number: DE91001825
Contract Number (DOE): AC07-76ID01570
Document Type: Report
Language: In English
Journal Announcement: EDB9101
Availability: NTIS, PC A06/MF A01; OSTI; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-510
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The Drum Assay System (DAS) at the Stored Waste Experimental Pilot Plant (SWEPP) is a second-generation active-passive neutron assay system. It has been used to assay over 5000 208-liter drums of transuranic waste from the Rocky Flats Plant (RFP). Data from these assays have been examined and compared with

the assays performed at Rocky Flats, mainly utilize counting of {sup 239}Pu gamma rays. For the most part the passive assays are in very good agreement with the Rocky Flats assays. The active assays are strongly correlated with the results of the other two methods, but require matrix-dependent correction factors beyond those provided by the system itself. A set of matrix-dependent correction factors has been developed from the study of the assay results. 3 refs., 4 figs., 3 tabs.
Major Descriptors: *alpha-bearing wastes -- classification; *low-level radioactive wastes -- classification; *radioactive waste management
Descriptors: data analysis; frequency analysis; gamma radiation; plutonium 239; radiation monitoring; rocky flats plant; WIPP
Broader Terms: actinide isotopes; actinide nuclei; alpha decay radioisotopes; electromagnetic radiation; even-odd nuclei; functional models; heavy nuclei; ionizing radiations; isotopes; management; materials; monitoring; national organizations; nuclear facilities; nuclei; pilot plants; plutonium isotopes; radiations; radioactive materials; radioactive waste facilities; radioactive wastes; radioisotopes; underground facilities; US AEC; US DOE; US ERDA; waste management; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 52

<DIALOG File 103: >
02959750 INS-90-036010; NTS-91-003590; EDB-90-176993; ERA-16-000186
Title: Greater-than-Class C low-level waste characterization technical review process
Author(s)/Editor(s): Hutchison, D.; Magleby, M.
Corporate Source: EG and G Idaho, Inc., Idaho Falls, ID (USA) (Code: 9507781)
Sponsoring Organization: DOE/NE
Conference Title: Institute of nuclear materials management conference
Conference Location: Los Angeles, CA (USA) Conference Date: 15-18 Jul 1990
Publication Date: 1990 (3 p)
Report Number(s): EGG-M-90321 CONF-9007106--78
Order Number: DE91001939
Contract Number (DOE): AC07-76ID01570
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9024
Availability: NTIS, PC A01/MF A01; OSTI; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-512
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Existing volume projections of greater-than-Class C low-level waste (GTCC LLW) vary significantly. The Department of Energy (DOE) National Low-Level Waste Management Program (NLLWMP) has undertaken activities to develop a best estimate of GTCC LLW volumes and activities for use as the planning basis. Initial information about the generation of GTCC LLW was obtained through a DOE Energy Information Administration survey. That information, combined with information from other related literature, formed the basis of a computer model, which projects potential GTCC LLW. This paper describes uncertainties in existing GTCC LLW characterization and volume projections data and describes the technical review process that is being used to assist in projections of GTCC LLW expected for storage and disposal. 8 refs., 2 tabs.
Major Descriptors: *low-level radioactive wastes -- classification; *radioactive waste management
Descriptors: planning; regulations; surveys; US DOE
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; waste management;

WASTES Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 53

<DIALOG File 103: >
02953714 NOV-90-037487; EDB-90-170958; INS-90-035467
Title: The U.S. DOE's Waste Acceptance Process
Author(s): Frei, M.W. (USDOE Office of Civilian Radioactive Waste Management, Washington, DC (USA)); Benz, E.F. (Jacobs Engineering, Roy F. Weston-CRWM Technical Support Team (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 717-722 (857 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9023
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The U.S. DOE developed the Waste Acceptance Process to ensure that high-level waste forms (other than spent fuel) produced for repository disposal would be compatible with repository licensing requirements. This paper reports on the Waste Acceptance Process which defines a sequence of documents and activities by repository designers and waste producers which provide the necessary waste form characteristic and repository performance data to support preparation of the repository license application. The fundamental principal which is guiding the Waste Acceptance Process Activities is that waste producers are responsible for producing quality waste forms to meet repository specifications; the repository program is responsible for demonstrating that waste forms so produced will perform acceptably in the repository to allow regulatory requirements to be satisfied.
Major Descriptors: *high-level radioactive wastes -- classification; *radioactive waste facilities -- licensing; *radioactive waste management --regulations
Descriptors: nuclear waste policy acts; quality assurance; radioactive waste disposal; specifications; us doe; waste forms
Broader Terms: laws; management; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E5200* -- Waste Disposal F2200 -- Nuclear Law -- Nuclear Installations F4000 -- Safeguards & Inspection

Citation 54

<DIALOG File 103: >
02953703 NOV-90-037411; EDB-90-170947; INS-90-035464
Title: Legal and regulatory issues regarding classification and disposal of wastes from actinide partitioning and transmutation
Author(s): Kocher, D.C. (Oak Ridge National Lab., TN (USA). Health and Safety Research Div.)

Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 197-201 (857 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9023
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Partitioning and transmutation of actinide radioelements in spent nuclear fuel from civilian power reactors is potentially attractive because the resulting wastes might be acceptable for disposal using systems which are considerably less costly than a deep geologic repository. At present, there are no legal or regulatory prohibitions to seeking alternatives to a geologic repository for disposal of such wastes, regardless of whether they would be classified as high-level waste or greater-than-Class-C low-level waste. This paper discusses how additional laws and regulations would be needed, and the Nuclear Regulatory Commission has been reluctant to alter the current framework for radioactive waste management, in which geologic repositories or near-surface facilities are the only disposal options established in law and regulations, unless a compelling need for alternatives with intermediate waste-isolation capabilities is demonstrated.
Major Descriptors: *radioactive waste disposal -- regulations; *radioactive waste facilities -- geology; *radioactive wastes -- classification
Descriptors: actinides; legal aspects; radioactive waste processing; spent fuels
Broader Terms: elements; energy sources; fuels; management; materials; metals; nuclear facilities; nuclear fuels; processing; radioactive materials; reactor materials; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage 056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-) 052001 -- Nuclear Fuels -- Waste Processing 053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal F2200 -- Nuclear Law -- Nuclear Installations E5100 -- Waste Treatment C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 55

<DIALOG File 103: >
02953693 NOV-90-037443; EDB-90-170937; INS-90-035421
Title: Planning an environmental restoration Closing the mixed waste settling basin at the Savannah River Plant
Author(s): Jackson, D.A.; Bauer, J.D. (USDOE Savannah River Operations Office, Aiken, SC (USA)); Boone, L.F.; Colven, W.P.; Pickett, J.B. (E.I. du Pont de Nemours and Co., Savannah River Plant, SC (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 109-111 (857 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9023
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)

Subfile: EPA (Energy Abstracts for Policy Analysis); ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: From 1958 to 1985 wastes generated by aluminum forming/metal finishing processes at the Savannah River Plant (Aiken, SC) were discharged to a settling basin; the waste in the basin is a mixed waste (both hazardous and radioactive). Use of the basin was discontinued in 1985, and physical closure in-situ began in 1988. State and federal environmental requirements affect all aspects of closure and must be an integral part of the closure strategy to enable processing and construction activities to proceed while still protecting the environment. This paper discusses how significant resources were expended to meet environmental protection requirements and resolve the issues involved in implementing these requirements for closure of the M-Area Settling Basin.
Major Descriptors: *environment -- safety; *hazardous materials --classification; *radioactive waste disposal -- planning; *radioactive wastes -- classification
Descriptors: government policies; mixtures; national environmental policy act; nuclear waste policy acts; savannah river plant
Broader Terms: dispersions; laws; management; materials; national organizations; radioactive materials; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
054000 -- Nuclear Fuels -- Health & Safety 290300 -- Energy Planning & Policy -- Environment, Health, & Safety
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5200* -- Waste Disposal E2300 -- Reactor Fuels F2200 -- Nuclear Law -- Nuclear Installations

Citation 56

<DIALOG File 103: >
02953618 NOV-90-037425; EDB-90-170862; INS-90-035401
Title: Hanford defense waste cleanup options
Author(s): Provost, D. (Nuclear and Mixed Waste Program, Washington Dept. of Ecology (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 105-108 (857 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9023
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The 570 square mile Hanford Reservation in southeastern Washington State has been used to produce plutonium for national defense programs since 1943. Operations have resulted in very large amounts of high-level, low-level, chemical, radioactive mixed wastes, and transuranic wastes. Some of the wastes have been stored in tanks, capsules, drums, and boxes on site, while others have been disposed of in the soil column. This paper reviews the history of the site, describes the wastes, and lists technical and policy issues which impact costs schedule.
major descriptors: *hanford reservation -- radioactive wastes; *radioactive waste disposal -- technology assessment; *radioactive waste storage -- technology assessment; *radioactive wastes -- classification

Descriptors: chemical wastes; cleaning; cost; environmental policy; high-level radioactive wastes; intermediate-level radioactive wastes; low-level radioactive wastes; plutonium; soils
Broader Terms: actinides; elements; government policies; management; materials; metals; national organizations; radioactive materials; radioactive wastes; storage; transuranium elements; us doe; us erda; waste disposal; waste management; waste storage; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
050900 -- Nuclear Fuels -- Transport, Handling, & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
E1510 -- Transport & storage
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations
F4200 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 57

<DIALOG File 103: >
02946598 NOV-90-033162; INS-90-034163; EDB-90-163841
Title: Development of a comprehensive radioactive waste classification system
Author(s): Smith, C.F.; Cohen, J.J. (Science Applications International Corp., Pleasanton, CA (USA))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 311-312 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Several previous studies have been conducted with the intent of developing a rational system for classification of radioactive wastes. Although none of the proposed systems has gained general acceptance, certain waste classes, specifically high-level waste and low-level waste suitable for shallow land burial have been essentially defined by regulation. Wastes which remain undefined include: those intermediate level wastes which require more restrictive controls than that provided by shallow land burial but not the high degree of isolation needed for high level wastes, and wastes below regulatory concern (BRC) which entail so low a radiological risk that they can be managed according to their nonradiological properties. This study has developed a framework within which the complete spectrum of radioactive wastes can be defined.
Major descriptors: *high-level radioactive wastes -- ground disposal; *low-level radioactive wastes -- ground disposal; *radioactive waste disposal -- regulations; *radioactive wastes -- classification
Descriptors: health hazards; risk assessment
Broader Terms: hazards; management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
054000 -- Nuclear Fuels -- Health & Safety

INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations
E2300 -- Reactor Fuels

Citation 58

<DIALOG File 103: >
02946597 NOV-90-033155; INS-90-034162; EDB-90-163840
Title: USEPA's proposed standard for BRC criteria
Author(s): Holcomb, W.F.; Gruhlke, J.M.; Galpin, F.L. (Environmental Protection Agency, Washington, DC (USA). Office of Radiation Programs)
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 361-364 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper reports that the EPA has developed technical information, cost data, a methodology for analyzing promising candidate waste streams, and a rationale for proposing BRC criteria. Risk assessments to support the BRC criteria include an analysis of surrogate radioactive waste streams, disposal alternatives, and diverse demographic settings. In considering the development of a proposed BRC level, EPA carefully weighted many factors. Foremost was protection of the public and the development of an exposure level with assurance of no undue risk. Also considered were other daily risks encountered, ability to demonstrate compliance, guidance for similar exemptions by other groups, consistency with other regulated risk levels, general population health risks, maximum annual exposures to critical population groups, and the costs presently associated with the regulation of these wastes.
Major descriptors: *radioactive waste disposal -- standards; *radioactive waste facilities -- health hazards; *radioactive wastes -- classification
Descriptors: nuclear waste policy acts; regulations; risk assessment; US EPA
Broader Terms: hazards; laws; management; materials; national organizations; nuclear facilities; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations
E2300 -- Reactor Fuels

Citation 59

<DIALOG File 103: >
02946581 NOV-90-033203; INS-90-034172; EDB-90-163824
Title: Recent developments in waste characterization at Chalk River Nuclear Laboratories

Author(s): Burns, K.I.; Edwards, W.J.; Csullog, G.W.; Everall, D.W.; Leeson, P.K.; Cheyne, J.E. (Atomic Energy of Canada Ltd., Chalk River, ON (Canada). Chalk River Nuclear Labs.)
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 351-358 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: Canada
Country of Publication: United States
Abstract: The waste characterization program (WCP) at Chalk River Nuclear Laboratories (CRNL) was initiated in 1982 to determine the physical, chemical and radiological properties of wastes intended for disposal in IRUS (Intrusion Resistant Underground Structure), a belowground vault to be constructed at CRNL. During the last year, work on the WCP has centered on determining the radionuclide inventories in candidate wastes for IRUS by gamma-ray monitoring and destructive radiochemical analysis. This paper presents the technical problems associated with monitoring various waste forms (geometry considerations, shielding problems, operating environment, etc.) and also presents details of the destructive radiochemical analysis program.
Major descriptors: *chalk river nuclear labs -- waste forms; *radioactive materials -- inventories; *radioactive waste disposal -- underground facilities; *radioactive wastes -- classification
Descriptors: chemical properties; gamma radiography; monitoring; multi-channel analyzers; personal computers; physical properties; radiochemistry; technology assessment
Broader Terms: atomic energy of canada ltd; canadian organizations; chemistry; computers; digital computers; electronic equipment; equipment; industrial radiography; management; materials; microcomputers; national organizations; pulse analyzers; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
400600 -- Radiation Chemistry
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
INIS Subject Categories: E5200* -- Waste Disposal
F4100 -- Safeguards & Inspection -- Technical Aspects
B1400 -- Radiation Chemistry
B1110 -- Nuclear methods in chemical & isotopic analysis

Citation 60

<DIALOG File 103: >
02946556 NOV-90-033202; INS-90-034099; EDB-90-163799
Title: A management approach for greater-than-Class C LLRW
Author(s): McCabe, G.H. (United States Congress, Office of Technology Assessment, Washington, DC (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 5-9 (844 p)
Report Number(s): CONF-890207--

Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The several thousand generators of the most dangerous class of commercial low-level radioactive waste (LLW), greater-than-Class C (GTCC) LLW, have no off-site storage or disposal facility available to them. GTCC waste is produced by the full range of typical LLW generators: universities, hospitals, nuclear utilities, and industries. Most of these generators are small, such as academic laboratories and small pharmaceutical companies. Several generators argue that their on-site storage capacity is shrinking and that over the next decade or so they will have no capacity remaining. The relatively high levels of radioactivity associated with GTCC waste demand that management options be made available to ensure that public health and safety are protected. The author discusses how a three-step integrated management approach could include: first, DOE granting limited access to one of its existing storage facilities while an extended-storage facility is being developed. Second, DOE could transfer GTCC waste from its limited-access facility to its extended-storage facility once it is operational. Third, DOE could provide a disposal facility for GTCC waste. Based on existing analysis, the conservative approach would be to dispose of GTCC waste in the high-level radioactive waste repository. It appears that environmental, institutional, and probably economic benefits would be gained.
Major descriptors: *environment -- safety; *radioactive waste facilities --performance; *radioactive waste management -- technology assessment; *radioactive wastes -- classification
Descriptors: low-level radioactive wastes; public health; radioactive waste processing; radioactive waste storage
Broader Terms: management; materials; nuclear facilities; processing; radioactive materials; radioactive wastes; storage; waste management; waste processing; waste storage; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
054000 -- Nuclear Fuels -- Health & Safety
052001 -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations
E2300 -- Reactor Fuels
E5100 -- Waste Treatment

Citation 61

<DIALOG File 103: >
02946543 NOV-90-033187; INS-90-034142; EDB-90-163786; ERA-15-052851
Title: Existing LLW treatment and disposal technology offers 17-to-1 volume reduction and advanced disposal at low cost
Author(s): Darnell, G.R.; Larsen, M.M. (Idaho National Engineering Lab., Idaho Falls, ID (USA))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 15-21 (844 p)
Report Number(s): CONF-890207--
Contract Number (DOE): AC07-76ID01570
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022

Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This paper reports how existing technology was used to develop a conceptual design for a waste treatment and disposal complex (WTDC). The designed facility would treat nearly 100% of all solid low-level radioactive waste (LLW), regardless of waste classification. Approximately 95 vol% of all LLW would be delivered in reusable shipment containers to the WTDC, where treatment would produce a liquid-free, install-compacted, 98 vol% inorganic waste. The treated waste would be packed with contaminated grout in uniform, smooth-sided, thin-walled, steel boxes. The boxes are stacked tightly in abovegrade, earth-mounded, concrete, disposal vaults, where they will be protected from water after vault closure. The 210-pound-per-cubic-foot waste prevents subsidence. Engineered earthen covers are covered over the vaults at the final closure and should keep water out of the waste long after vault degradation. A volume reduction factor of 17-to-1 is achieved through sorting, incineration, metal sizing operations, intense compaction, and grouting.
major descriptors: *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste disposal -- technology assessment
Descriptors: concretes; cost; design; minimization; radioactive waste facilities; radioactive waste processing; spent fuel casks; volume
Broader Terms: building materials; casks; containers; management; materials ; nuclear facilities; processing; radioactive materials; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
E5100 -- Waste Treatment
F4200 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 62

<DIALOG File 103: >
02946506 NOV-90-033173; INS-90-034065; EDB-90-163749
Title: The management of mixed low-level radioactivewaste in the nuclear power industry
Author(s): Baird, R.D.; Jennrich, E.A.; Shuman, R.; Merrell, G. (Rogers and Associates Engineering Corp., Salt Lake City, UT (USA)); Rogers, B.C. (Nuclear Waste Management, Inc. (US)); Fairobent, L.A. (Nuclear Management Resources Council (US)); Shockley, V.E. (Washington Public Power Supply System, WA (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 201-204 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States

Abstract: As a result of investigations sponsored by the nuclear power industry, the definition of mixed low-level radioactive waste (mixed waste) in the industry is clarified. A methodology for estimating the annual generation rate of mixed waste is presented and its application to a typical nuclear power plant is illustrated. Effective management practices to minimize the generation of mixed waste are described and strategies to deal with unavoidable mixed waste are identified.
major descriptors: *intermediate-level radioactive wastes -- classification ; *low-level radioactive wastes -- classification; *nuclear power plants -- radioactive waste management; *radioactive waste management
Broader Terms: management; materials; nuclear facilities; power plants; radioactive materials; radioactive wastes; thermal power plants; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 63

<DIALOG File 103: >
02946396 NOV-90-033211; INS-90-033928; EDB-90-163639
Title: 1988-year of high integrity container evaluation, controversy and regulatory action
Author(s): Jones, D. (LN Technologies Corp., Columbia, SC (USA))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 389-394 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9022
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: During 1988, the Nuclear Regulatory Commission(NRC) completed review of and prepared technical evaluation reports on several topical reports describing containers designed to meet the 10CFR61 requirements for high integrity containers (HICs). An all metal Ferralium container and a stainless steel/polyethylene lined container were approved by the NRC. However, the NRC did not approve any containers designed from polyethylene material. The NRC staff concluded that polyethylene containers do not meet the structural stability requirements of Part 61, and unless they are combined with some engineered structure or overpack, they are not adequate for disposal of low-level radioactive wastes that require disposal in a structurally stable form. In conflict with these NRC findings, the State of South Carolina Department of Health and Environmental Control (SCDHEC) has given interim approval for continued use of polyethylene containers at the Barnwell disposal site with some restrictions on how the containers are buried depending on the classification of the waste. This paper reviews the applicable federal regulations, presents a chronology of events describing how the controversy over high integrity containers evolved from 1980 to 1989, summarizes the technical issues involved and suggests an approach that waste generators should follow during this situation of regulatory uncertainty.
major descriptors: *containers -- materials; *polyethylenes; *radioactive wastedisposal -- regulations; *radioactive waste storage -- containers; *radioactive wastes -- classification; *stainless steels
Descriptors: government policies; liabilities; radioactive waste facilities; resource recovery acts; south carolina; US NRC
Broader Terms: alloys; federal region iv; high alloy steels; iron alloys; iron base alloys; laws; management; materials; national organizations; north america; nuclear facilities; organic compounds; organic polymers; polymers; polyolefins; radioactive materials; steels; storage; usa; waste disposal; waste management; waste storage; wastes

Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
052002 -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
420204 -- Engineering -- Shipping Containers
INIS Subject Categories: E1510* -- Transport & storage
E5200 -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations
E1520 -- Shipping containers

Citation 64

<DIALOG File 103: >
02936242 NOV-90-033100; INS-90-031993; EDB-90-153486
Title: Processing of wastes with Aquaset/Petroset family of solidificaton media
Author(s): Rowsell, D. (Fluid Tech, Inc., Las Vegas, NV (US)); Doyle, R.D. ; Low, R.L. (US Ecology, Inc., Charlotte, NC (US))
Title: Waste processing, transportation, storage and disposal, technical programs and public education
Author(s)/Editor(s): Post, R.G. (Univ. of Arizona, Dept. of Nuclear and Energy Engineering, Tucson, AZ (US))
Conference Title: Waste management '89: 15th international waste management symposium conference
Conference Location: Tucson, AZ (USA) Conference Date: 26 Feb - 2 Mar 1989
Publisher: Tucson, AZ (USA) Arizona Board of Regents
Publication Date: 1989 p 739-743 (844 p)
Report Number(s): CONF-890207--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9021
Availability: Arizona Board of Regents, College of Engineering and Mines, Tucson, AZ (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Aquaset, Petroset, Aquaset II, and Petroset II are solidification agents which were developed for the efficient disposal of liquid wastes. They are slightly alkaline, inert, non-corrosive and non-biodegradable. The waste fluid along with dissolved and suspended solids are fixed in a non-pourable flexible matrix that will not undergo brittle fragmentation under accidental spill conditions. These solidification agents immobilize wastes via complex bonding mechanisms and result in homogeneous waste solids with excellent leach resistance. Class A unstable wastes solidified with these media are approved for burial at the Richland, WA and Beatty, NV burial sites. This paper discusses how the Aquaset/Petroset family of solidification media can provide the waste generator with an economical and volume efficient (40-48 gallons of waste in a 55-gallon drum) method of disposing of generally hard to solidify wastes.
major descriptors: *liquid wastes -- solidification; *radioactive waste processing -- cost; *radioactive waste processing -- technology assessment; *radioactive wastes -- classification; *south carolina -- r adioactive waste disposal
Descriptors: ground disposal; national environmental policy act; nuclear facilities; site selection; waste oils
Broader Terms: federal region iv; laws; management; materials; north america; oils; organic compounds; other organic compounds; phase transformations; processing; radioactive materials; usa; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal

E5100 -- Waste Treatment
F4200 -- Safeguards & Inspection -- Nontechnical Aspects
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 65

<DIALOG File 103: >
02927868 NOV-90-028275; EDB-90-145111; INS-90-031827; ERA-15-048361
Title: Characteristics of potential repository wastes
Author(s): Notz, K.J. (Oak Ridge National Lab., TN (USA))
Title: High level radioactive waste management
Conference Title: 1. international topical meeting on high-level radioactive waste management
Conference Location: Las Vegas, NV (USA) Conference Date: 8-12 Apr 1990
Publisher: La Grange Park, IL (USA) American Nuclear Society
Publication Date: 1990 p 1316-1324 (1456 p)
Report Number(s): CONF-900406--
Contract Number (DOE): AC05-84OR21400
ISBN: 0-87262-751-9
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9020
Availability: American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60525 (USA)
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This paper discusses the eventual disposal in a repository of spent fuels, high-level waste, and other radioactive wastes that may require long-term isolation. The characteristics Data Base, created to systematically tabulate the technical characteristics of these materials is presented. Data availability are given.
Major descriptors: *radioactive wastes -- classification
Descriptors: radioactive waste disposal
Broader Terms: management; materials; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
400702 -- Radiochemistry & Nuclear Chemistry -- Properties of Radioactive Materials
INIS Subject Categories: E5000* -- Waste Management
B1320 -- Properties of radioactive materials

Citation 66

<DIALOG File 103: >
02921156 EDB-90-138397; NTS-91-000208; ERA-15-046687
Title: A sample compositing strategy for classifying non-radioactive hazardous waste for transport
Author(s)/Editor(s): Winn, W.G.
Corporate Source: Westinghouse Savannah River Co., Aiken, SC (USA) (Code: 9525316)
Sponsoring Organization: DOE/DP
Publication Date: Jun 1990 (17 p)
Report Number(s): WSRC-RD-90-10
Order Number: DE90016674
Contract Number (DOE): AC09-89SR18035
Document Type: Report
Language: In English
Journal Announcement: EDB9019

Availability: NTIS, PC A03/MF A01 - OSTI; GPO Dep.
Distribution: (Report):2 (MF):4 STD-705
Subfile: ERA (Energy Research Abstracts); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: A probabilistic strategy for sample compositing is developed to minimize the radiometric analyses required for classifying non-radioactive waste for transport. Such waste must have concentrations of total radioactivity that are below an acceptance limit of L = 2 nCi/g. A composite of N different samples must have a radioactive concentration below L/N to assure that no individual sample is unacceptable. Unacceptable samples are eventually identified by analyses of successive splits composited with N/2, N/4, {hor ellipsis} of the original samples. The probable number of such analyses is derived using Gaussian distributions for the composite concentrations, per invoking the Central Limit Theorem. A preliminary compositing strategy, based only on the average concentration {mu}, uses N = L/{mu} to yield a minimum fraction of {approx}2{mu}/L analyses per total samples. These approximations are useful for L/{mu} > 4. Refined strategies, based on both the {mu} and {sigma} for the concentration distribution, define the optimization more precisely. Experimental data from composites of 880 samples of low-level radiometric waste are consistent with the calculated predictions. 11 refs., 4 figs., 1 tab.
major descriptors: *hazardous materials -- classification; *radioactive wastes -- classification
Descriptors: calculation methods; probabilistic estimation; statistics; transport
Broader Terms: materials; mathematics; radioactive materials; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
990200 -- Mathematics & Computers

Citation 67

<DIALOG File 103: >
02904716 NOV-90-022351; INS-90-024750; EDB-90-121957
Title: Application of modular vault dry storage to Public Service of Colorado-Fort St. Vrain
Author(s): Lehr, M. (Public Service Co. of Colorado, Denver, CO (USA)); Ealing, C.J. (GEC Alsthom Engineering Systems, Ltd., Whetstone, Leicester (GB)); Agarwal, B.K. (Foster Wheeler Energy Applications, Inc., Livingston, NJ (USA))
Source: JNMM (Journal of the Institute of Nuclear Materials Management) (USA) v 18:3. Coden: JNMME ISSN: 0893-6188
Publication Date: May 1990 p 22-29
Document Type: Journal Article
Language: In English
Journal Announcement: EDB9017
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper discusses NRC approval for the first dry vault storage system to be submitted for nonsite specific design approval. It describes the first site specific application of the FW/GEC modular vault dry store (MVDS) for the Public Service of Colorado---Fort St. Vrain site. The decision to permanently shut down the Fort St. Vrain high temperature gas-cooled reactor provides the need to store on site 1,482 irradiated fuel blocks and a quantity of other reactor core components categorized as greater than Class C wastes. The MVDS system has been selected for the safe storage of these items in a facility designed to receive, store and discharge fuel to the repository totally independent from the original reactor facilities.
major descriptors: *radioactive wastes -- classification; *spent fuel storage -- design
Descriptors: dry storage; HTGR type reactors; nuclear facilities; reactor shutdown; safety; US NRC
Broader Terms: gas cooled reactors; graphite moderated reactors; materials; national organizations; radioactive materials; reactors; shutdowns; spent fuel storage; storage; wastes

Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
052002 -- Nuclear Fuels -- Waste Disposal & Storage
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
420204 -- Engineering -- Shipping Containers
INIS Subject Categories: E1510* -- Transport & storage
E5200 -- Waste Disposal
F4100 -- Safeguards & Inspection -- Technical Aspects
E1520 -- Shipping containers

Citation 68

<DIALOG File 103: >
02897816 INS-90-023573; EDB-90-115057
Title: TRU-ART: A cost-effective prototypical neutron imaging technique for transuranic waste certification systems
Author(s)/Editor(s): Horton, W.S.
Corporate Source: Illinois Univ., Urbana, IL (USA) (Code: 3112000)
Publisher: Urbana-Champaign, IL (US) Univ. of Illinois
Publication Date: 1989 (243 p)
Academic Degree: Thesis (Ph. D.)
Document Type: Miscellaneous; Dissertation or Thesis
Language: In English
Journal Announcement: EDB9016
Availability: University Microfilms, PO Box 1764, Ann Arbor, MI 48106, Order No.89-16,264
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The certification of defense radioactive waste as either transuranic or low-level waste requires very sensitive and accurate assay instrumentation to determine the specific radioactivity within an individual waste package. An assay instrument that employs a new technique (TRU-ART), which can identify the location of the radioactive material within a waste package, was designed, fabricated, and tested to potentially enhance the certification of problem defense waste drums. In addition, the assay instrumentation has potential application in radioactive waste reprocessing and neutron tomography. The assay instrumentation uses optimized electronic signal responses from an array of boral- and cadmium-shielded polyethylene-moderated {sup 3}H detector packages. Normally, thermal neutrons that are detected by {sup 3}H detectors have very poor spatial dependency that may be used to determine the location of the radioactive material. However, these shielded-detector packages of the TRU-ART system maintain the spatial dependency of the radioactive material in that the point of fast neutron thermalization is immediately adjacent to the {sup 3}H detector. The TRU-ART was used to determine the location of radioactive material within three mock-up drums (empty, peat moss, and concrete) and four actual waste drums. The TRU-ART technique is very analogous to emission tomography. The mock-up drum and actual waste drum data, which were collected by the TRU-ART, were directly input into a algebraic reconstruction code to produce three-dimensional isoplots. Finally, a comprehensive fabrication cost estimate of the fielded drum assay system and the TRU-ART system was determined, and, subsequently, these estimates were used in a cost-benefit analysis to compare the economic advantage of the respective systems.
major descriptors: *alpha-bearing wastes -- classification; *low-level radioactive wastes -- classification
Descriptors: certification; containers; cost benefit analysis; cost estimation; helium 3; measuring instruments; measuring methods; neutron detection; neutron detectors; space dependence; waste forms
Broader Terms: detection; even-odd nuclei; helium isotopes; isotopes; light nuclei; materials; measuring instruments; nuclei; radiation detection; radiation detectors; radioactive materials; radioactive wastes; stable isotopes; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 69

<DIALOG File 103: >
02841885 EDB-90-059118; NTS-90-013032; INS-90-011893; ERA-15-025581
Title: Nuclear waste drum assayer
Author(s)/Editor(s): Brodzinski, R.L.; Turner, P.J.
Corporate Source: Pacific Northwest Lab., Richland, WA (USA) (Code: 9512268)
Sponsoring Organization: DOE/NE
Conference Title: 16. annual waste management symposium: working towards a cleaner environment
Conference Location: Tucson, AZ (USA) Conference Date: 25 Feb - 1 Mar 1990
Publication Date: Mar 1990 (5 p)
Report Number(s): PNL-SA-17315 CONF-900210--36
Order Number: DE90009177
Contract Number (DOE): AC06-76RL01830
Document Type: Report; Conference Literature
Language: In English
Journal Announcement: EDB9009
Availability: NTIS, PC A02/MF A01; OSTI; INIS; GPO Dep.
Distribution: (Report):0 (MF):4 MN-510
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: This paper describes a completely transportable, one-man-operable nuclear waste drum assayer capable of determining the concentrations of all radioisotopes in the drum. The principal radiation measuring devices are a segmented gamma-ray spectrometer utilizing a collimated germanium diode detector and two banks of neutron-sensitive proportional counters nearly surrounding the rotating drum. The neutron counters provide a sensitive measure of the transuranic activities present, and the germanium spectrometer provides a quantitative determination of the gamma-ray emitting radioactivities. The bremsstrahlung radiation from {sup 90}Sr is also measured by the germanium detector and is used to quantify this isotope. Software algorithms determine the concentrations of the so-called difficult-to-measure radionuclides based on the directly measured nuclides and operator input regarding the source waste stream. The system can quantitatively sort waste into transuranic, low-level, or even the proposed new category of below regulatory concern.'' 4 refs.
major descriptors: *alpha-bearing wastes -- classification; *hazardous materials -- classification; *low-level radioactive wastes -- classification; *radiation detectors
Descriptors: algorithms; bremsstrahlung; contact handling; containers; data acquisition; fission products; gamma spectrometers; ge semiconductor detectors; nuclear decay; radioactive waste disposal; radioecological concentration; radioisotopes; sanitary landfills; strontium
Broader Terms: alkaline earth metals; decay; ecological concentration; electromagnetic radiation; elements; isotopes; management; materials; mathe matical logic; measuring instruments; metals; radiation detectors; radiations; radioactive materials; radioactive wastes; semiconductor detectors; spectrometers; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
440103 -- Radiation Instrumentation -- Nuclear Spectroscopic Instrumentation
INIS Subject Categories: E5200* -- Waste Disposal
E4120 -- Nuclear spectroscopic instrumentation

Citation 70

<DIALOG File 103: >
02841847 NOV-90-002369; EDB-90-059080; INS-90-011854
Title: High temperature slagging incineration of hazardous waste

Author(s): Vanbrabant, R.; Van de Voorde, N. (Belgian Nuclear Research Center (SCK/CEN), Waste Treatment Dept., Mol, B-2400, (BE))
Title: Proceedings of the second international conference on new frontiers for hazardous waste management
Conference Title: 2. international conference on new frontiers for hazardous waste management
Conference Location: Pittsburgh, PA (USA) Conference Date: 27-30 Sep 1987
Publisher: Cincinnati, OH (USA) Environmental Protection Agency (US)
Publication Date: 1987 p 35-42 (591 p)
Report Number(s): CONF-870941--
Note: EPA/600/9-87/018F
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9009
Availability: Environmental Protection Agency (US), 26 W. St. Clair St., Cincinnati, OH 45268 (USA)
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: Belgium
Country of Publication: United States
Abstract: The SCK/CEN, as the treatment center for the low level radioactive waste in Belgium, develops appropriate treatment systems for different kinds of wastes. The technical concept of the high temperature slagging incineration system has been developed and improved. The construction of the first demonstration plant was initiated in 1974. Since then the system has been operated regularly and further developed with the view to industrial operations. Now it handles about 5 tons of waste in a week. The waste which is treated consists of low level beta/gamma and alpha-contaminated radioactive waste. Because of the special characteristics the system is thought to be an excellent incineration system for industrial hazardous waste as well. Recently the SCK/CEN has received the authorization to treat industrial hazardous waste in the same installation. Preliminary tests have been executed on special waste products, such as PCB-contaminated liquids, with excellent incineration results. Incineration efficiency up to 99.9999% could be obtained. The paper presents the state of the art of this original The SCK/CEN-technology and gives the results of the tests done with special hazard
major descriptors: *belgium -- low-level radioactive wastes; *industrial wastes -- classification; *low-level radioactive wastes -- radioactive waste management; *radioactive waste management -- technology assessment
Descriptors: cleaning; demonstration plants; hazardous materials; high temperature; incinerators; waste processing plants
Broader Terms: europe; industrial plants; management; materials; radioactive materials; radioactive wastes; waste management; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 71

<DIALOG File 103: >
02814565 EDB-90-031787; NTS-90-010196; ERA-15-016113
Title: (Standardization of radioactive waste categories)
Author(s)/Editor(s): Mezga, L.J.
Corporate Source: Oak Ridge Gaseous Diffusion Plant, TN (USA) (Code: 4830000)
Sponsoring Organization: DOE/NE
Publication Date: 10 Jan 1990 (76 p)
Report Number(s): K/ESH/FTR-2
Order Number: DE90006852
Contract Number (DOE): AC05-84OT21400
Document Type: Report
Language: In English
Journal Announcement: EDB9005
Availability: NTIS, PC A05/MF A01 - OSTI; GPO Dep.

Distribution: (Report):0 (MF):4 MN-500
Subfile: ERA (Energy Research Abstracts); NTS (NTIS). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The traveler participated in the consultants' meeting resulting in the development of a draft revision of Technical Reports Series No. 101 Standardization of Radioactive Waste Categories.'' This effort was based on a previous draft developed during an earlier consultants meeting. High-, intermediate- and low-level solid, gaseous, and liquid wastes are classified according to hazard and half-life based principally upon existing International Atomic Energy Agency (IAEA) classification systems. In addition to a general waste classification scheme, other factors to be considered in the management of wastes from an operational standpoint are presented. This report provides details of the visit to the IAEA, a summary of impressions, recommendations and/or conclusions concerning the United States Radioactive Waste Management Program. 18 refs., 1 fig., 12 tabs.
Major descriptors: *gaseous wastes -- classification; *high-level radioactive wastes -- classification; *liquid wastes -- classification; *low-level radioactive wastes -- classification; *solid wastes -- classification
Descriptors: austria; half-life; hazards; iaea; information needs; international cooperation; radioactive waste disposal; radioactive waste management; radioactive waste storage; transport; travel; waste forms
Broader terms: cooperation; europe; international organizations; management; materials; radioactive materials; radioactive wastes; storage; waste disposal; waste management; waste storage; wastes; western europe
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management

Citation 72

<DIALOG File 103: >
02797607 EDB-90-014823; NTS-90-008126; ERA-15-012653
Title: Alternatives for disposal of raffinate from the TRUEX process
Author(s)/Editor(s): Trevorrow, L.E.; Vandegrift, G.F.
Corporate Source: Argonne National Lab., IL (USA) (Code: 0448000)
Sponsoring Organization: DOE/DP
Publication Date: Dec 1989 (68 p)
Report Number(s): ANL-89/27
Order Number: DE90004483
Contract Number (DOE): W-31109-ENG-38
Document Type: Report
Language: In English
Journal Announcement: EDB9003
Availability: NTIS, PC A04/MF A01 - OSTI; GPO Dep.
Distribution: (Report):1 (MF):4 MN-721
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); ETD (Energy Technology Data Exchange). TIC (Technical Information Center)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: Possible methods for disposing of the immobilized raffinate from TRUEX processing are reviewed. The purpose of the TRUEX process is to extract transuranium elements from high-level and TRU wastes into a small volume that can be managed at lower cost than that of the original wastes. The raffinate from the TRUEX process, containing negligible concentrations of transuranium elements, would be combined with salt solutions also derived from processing high-level waste, and the mixture would be converted to grout. The most important determinants of the destination of this grout are concentration of fission products in it, the interpretation of waste-classification rules, and the characteristics of the site on which the wastes were generated (whether they permit on-site disposal). Most likely, the treatment of this grout will result in its classification as LLW, and emplacement in preformed concrete vaults, in a near-surface location, on the site where the waste had been generated. Nevertheless, examinations of hypothetical cases which would result in its classification as a Greater-than-Class-C low-level waste

or a high- level waste are also examined. Characteristics of the waste management systems that might be involved in handling the TRUEX raffinate for each of these waste classifications are briefly described. 95 refs., 16 figs., 5 tabs.
Major descriptors: *hanford reservation -- site characterization; *high-level radioactive wastes -- radioactive waste processing; *savannah river plant -- site characterization; *waste processing plants -- radioactive waste management
Descriptors: chemical analysis; commercial sector; comparative evaluations; computerized simulation; concretes; economic analysis; environmental policy; fission products; geologic formations; grouting; operation; planning; regulations; t codes; tanks; technology assessment; transuranium elements
Broader Terms: building materials; computer codes; containers; economics; elements; government policies; industrial plants; isotopes; management; materials; national organizations; processing; radioactive materials; radioactive wastes; simulation; US AEC; US DOE; US ERDA; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
990200 -- Mathematics & Computers

Citation 73

<DIALOG File 103: >
02760893 AIX-20-080370; EDB-89-151932
Title: Proposed classification system for high-level and other radioactive wastes
Author(s): Kocher, D.C. (Oak Ridge National Laboratory, TN (USA). Health and Safety Research Division); Croff, A.G. (Oak Ridge National Laboratory, TN (USA). Chemical Technology Division)
Source: Radioactive Waste Management (Switzerland) v 11:3. Coden: RWMAD
ISSN: 0142-2405
Publication Date: Jun 1989 p 227-268
Note: A complete presentation of the proposed waste classification system is contained in ORNL/TM-10289 (1987), RN 19:006020
Document Type: Journal Article
Language: In English
Journal Announcement: EDB8922
Subfile: ETD (Energy Technology Data Exchange). INIS (non-US Atomindex input AIX)
US DOE Project/NonDOE Project: NP
Country of Origin: Switzerland
Country of Publication: Switzerland
Abstract: On the basis of the definition of high-level wastes (HLW) in the Nuclear Waste Policy Act of 1982 and previous descriptions of reprocessing wastes, a definition is proposed based on the concept that HLW is any waste which is highly radioactive and requires permanent isolation. This conceptual definition of HLW leads to a two-dimensional waste classification system in which one axis, related to 'highly radioactive', is associated with shorter-term risks from waste management and disposal due to high levels of decay heat and external radiation, and the other axis, related to 'requires permanent isolation', is associated with longer-term risks from waste disposal. Wastes that are highly radioactive are defined quantitatively as wastes with a decay heat (power density) greater than 50 W/m{sup 3} or an external dose-equivalent rate greater than 100 rem/h (1 Sv/h) at a distance of 1 m from the waste, whichever is more restrictive. Wastes that require permanent isolation are defined quantitatively as wastes with concentrations of radionuclides greater than the Class-C limits that are generally acceptable for near-surface land disposal, as obtained from the Nuclear Regulatory Commission's 10 CFR Part 61 and its associated methodology. This proposal leads to similar definitions of two other waste classes: transuranic (TRU) waste and equivalent is any waste that requires permanent isolation but is not highly radioactive; and low-level waste (LLW) is any waste that does not require permanent isolation, without regard to whether or not it is highly radioactive. 31 refs.; 3 figs.; 4 tabs.
major descriptors: *high-level radioactive wastes -- radiation doses; *high-level radioactive wastes -- radioactivity; *radioactive waste disposal -- high-level radioactive wastes
Descriptors: dose equivalents; dose rates; low-level radioactive wastes; nuclear waste policy acts; radiation hazards; radioisotopes
Broader Terms: doses; hazards; health hazards; isotopes; laws; management; materials; radioactive materials;

radioactive wastes; waste disposal; waste management; wastes
Subject categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 74

<DIALOG File 103: >
02760857 EDB-89-151896; INS-89-027853
Title: The EPA (Environmental Protection Agency) low-level waste standard-a status report
Author(s): Galpin, F.L.; Gruhlke, J.M.; Holcomb, W.F.
Conference Title: American Nuclear Society annual meeting
Conference Location: San Diego, CA (USA) Conference Date: 12-16 Jun 1988
Source: Transactions of the American Nuclear Society (USA) v 56. Coden: TANSA ISSN: 0003-018X
Publication Date: 1988 p 182-183
Report Number(s): CONF-880601--
Document Type: Journal Article; Conference Literature
Language: In English
Journal Announcement: EDB8922
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: The Environmental Protection Agency (EPA) is developing generally applicable environmental standards for land disposal of Atomic Energy Act (AEA) low-level radioactive wastes (LLW) and certain naturally occurring and accelerator-produced radioactive material (NARM) wastes. It is EPA's intention that the LLW standards will protect public health and the environment. The LLW standards would cover disposal of all AEA materials not controlled by other EPA standards and some natural radioactive materials. Coverage of federal waste is significant, because the federal government generates and disposes of >40% of all LLW nationwide, and a uniform standard for all LLW disposal is both a desirable and an achievable goal. Publication of a proposed LLW standard is planned in 1988, and a final standard a year later. This standard will have several important and closely related areas of focus which are discussed in the paper.
major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: activity levels; ground water; quality assurance; quantity; radiation protection; regulations; safety standards; US DOE; US EPA
Broader Terms: hydrogen compounds; management; materials; national organizations; oxygen compounds; radioactive materials; radioactive wastes; standards; waste disposal; waste management; wastes; water
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 75

<DIALOG File 103: >
02760819 EDB-89-151858; INS-89-027833
Title: The NRC (Nuclear Regulatory Commission) reviews of low-level waste forms and containers
Author(s): Tokar, M.
Conference Title: American Nuclear Society annual meeting
Conference Location: San Diego, CA (USA) Conference Date: 12-16 Jun 1988
Source: Transactions of the American Nuclear Society (USA) v 56. Coden: TANSA ISSN: 0003-018X
Publication Date: 1988 p 181-182
Report Number(s): CONF-880601--
Document Type: Journal Article; Conference Literature

Language: In English
Journal Announcement: EDB8922
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
US DOE Project/NonDOE Project: P
Country of Origin: United States
Country of Publication: United States
Abstract: As stated in the U.S. Nuclear Regulatory Commission (NRC) regulation (10CFR61) for land disposal of low-level radioactive waste (LLW), class B and C wastes must have structural stability. Part 61 also indicates that a structurally stable waste form is one that will maintain its physical dimensions and form under expected disposal conditions, including the weight of overburden and compaction equipment, the presence of moisture and microbial activity, and internal factors, such as radiation effects and chemical changes. However, beyond describing some general characteristics to which the waste must conform, such as limits on the amount of freestanding liquid and the avoidance of pyrophoric material, the regulation provides no guidance on how LLW can be demonstrated to have the required structural stability. That type of guidance is provided in a Technical Position (TP) on Waste Form Stability, which was issued in May 1983. Thus, to meet the requirements of 10CFR61, vendors of high-integrity containers (HICs) and waste solidification agents develop test data for their HIC designs and waste formulations in accordance with recommendations provided in the 1983 TP. The data are then submitted with a topical report for technical review. The technical review is intended to lead to a conclusion that the HIC design or solidification agent formulation meets the stability requirements of Part 61 and thus is acceptable for disposal at a LLW disposal facility.
major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste processing
Descriptors: compacting; containers; leaching; moisture; radioactive waste management; regulations; solidification; stability; US NRC
Broader Terms: dissolution; management; materials; national organizations; phase transformations; processing; radioactive materials; radioactive wastes; separation processes; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 76

<DIALOG File 103: >
02385115 EDB-89-131090
Author(s): Lee, D.W.; Kocher, D.C.
Title: Performance assessment for future low-level waste disposal facilities at ORNL
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 11. annual DOE low level waste management conference
Conference Location: Pittsburgh, PA, USA Conference Date: 22-24 Aug 1989
Publication Date: 1989 p 8
Report Number(s): CONF-890854-12
Order Number: DE89016873
Contract Number (DOE): AC05-84OR21400
Note: Portions of this document are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: EDB8900
Availability: NTIS, PC A02/MF A01; OSTI; INIS; GPO Dep.; 1.
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: This paper discusses the strategy for waste management on the Oak Ridge Reservation (ORR) and the approach to preparing future performance assessments that has evolved from previous performance assessment

studies of low-level radioactive waste disposal on the ORR. The strategy for waste management is based on the concept that waste classification should be determined by performance assessment other than the sources of waste. This dose-based strategy for waste classification and management places special importance on the preparation and interpretation of waste disposal performance assessments for selecting appropriate disposal technologies and developing waste acceptance criteria. Additionally, the challenges to be overcome in the preparation of performance assessments are discussed. 7 refs.
major descriptors: *low-level radioactive wastes -- ground disposal; *performance testing -- planning
Descriptors: evaluation; ORNL
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; testing; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 77

<DIALOG File 103: >
02385066 EDB-89-131041
Author(s): Stewart, R.C.; Dickerson, L.S.; Joost, S.F.; Osucha, D.C.
Title: Remote-handled transuranic solid waste characterization study: Oak Ridge National Laboratory
Corporate Source: Oak Ridge National Lab., TN (USA)
Publication Date: Jun 1989 p 95
Report Number(s): ORNL/TM-11050
Order Number: DE89015681
Contract Number (DOE): AC05-84OR21400
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: EDB8900
Availability: NTIS, PC A05/MF A01 - OSTI; 1.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: At Oak Ridge National Laboratory (ORNL) several facilities generate TRU waste. Since 1970, this waste has been stored in a retrievable manner on the Oak Ridge Reservation. However, the DOE master plan for TRU waste establishes a goal of ending interim storage and achieving permanent disposal of DOE TRU waste at the Waste Isolation Pilot Plant (WIPP), a geologic repository for TRU waste located about 2000 ft underground in a salt formation near Carlsbad, New Mexico. ORNL's remote-handled (RH) TRU waste (waste with surface dose rates (of its container) greater then 200 mrem/h) will require processing before receiving certification for shipment to WIPP. The objective of this solid waste characterization task is to accurately characterize RH TRU and SC TRU solid waste currently stored at ORNL to assist in planning the facility design for WHPP. Execution of the solid waste characterization task objective will satisfy the following two goals. 8 refs., 11 figs., 8 tabs.
major descriptors: *alpha-bearing wastes -- materials handling; *remote handling -- planning; *solid wastes -- classification
Descriptors: certification; inventories; ornl; radioactive waste facilities; remote handling equipment; waste forms; WIPP broader terms: equipment; functional models; materials; materials handling equipment; national organizations; nuclear facilities; pilot plants; radioactive materials; radioactive waste facilities; radioactive wastes; underground facilities; US AEC; US DOE; US ERDA; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
053000 -- Nuclear Fuels -- Environmental Aspects

Citation 78

<DIALOG File 103: >
02385065 EDB-89-131040
Author(s): Schultz, F.J.; Smith,. M.A.
Title: Waste characterization: What's on second
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 11. annual DOE low level waste management conference
Conference Location: Pittsburgh, PA, USA Conference Date: 22-24 Aug 1989
Publication Date: Jul 1989 p 23
Report Number(s): CONF-890854-8
Order Number: DE89016218
Contract Number (DOE): AC05-84OR21400
Note: Portions of this document are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: EDB8900
Availability: NTIS, PC A03/MF A01; OSTI; INIS; GPO Dep.; 1.
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: Waste characterization is the process whereby the physical properties and chemical composition of waste are determined. Waste characterization is an important element which is necessary to certify that waste meets the acceptance criteria for storage, treatment, or disposal. Department of Energy (DOE) Orders list and describe the germane waste form, package, and container criteria for the storage of both solid low-level waste package, and container criteria for the storage of both solid low-level waste (SLLW) and transuranic (TRU) waste, including chemical composition and compatibility, hazardous material content (e.g., lead), fissile material content, radioisotopic inventory, particulate content, equivalent alpha activity, thermal heat output, and absence of free liquids, explosives, and compressed gases. At the Oak Ridge National Laboratory (ORNL), the responsibility for waste characterization begins with the individual or individuals who generate the waste. The generator must be able to document the type and estimate the quantity of various materials (e.g., waste forms -- physical characteristics, chemical composition, hazardous materials, major radioisotopes) which have been placed into the waste container. Analyses of process flow sheets and a statistically valid sampling program can provide much of the required information as well as a documented level of confidence in the acquired data. A program is being instituted in which major generator facilities perform radionuclide assay of small packets of waste prior to being placed into a waste drum. 17 refs., 1 fig., 4 tabs.
major descriptors: *hazardous materials -- classification; *radioactive wastes -- classification
Descriptors: waste forms
Broader Terms: materials; radioactive materials; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5100* -- Waste Treatment
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 79

<DIALOG File 103: >
02379471 EDB-89-125445
Author(s): Luksic, A.
Title: Spent fuel assembly hardware: Characterization and 10 CFR 61 classification for waste disposal: Volume 1, Activation measurements and comparison with calculations for spent fuel assembly hardware
Corporate Source: Pacific Northwest Lab., Richland, WA (USA)
Publication Date: Jun 1989 p 107

Report Number(s): PNL-6906-Vol.1
Order Number: DE89015190
Contract Number (DOE): AC06-76RL01830
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: EDB8900
Availability: NTIS, PC A06/MF A01 - OSTI; 1.
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: Consolidation of spent fuel is under active consideration as the US Department of Energy plans to dispose of spent fuel. During consolidation, the fuel pins are removed from an intact fuel assembly and repackaged into a more compact configuration. After repackaging, approximately 30 kg of residual spent fuel assembly hardware per assembly remains that is also radioactive and requires disposal. Understanding the nature of this secondary waste stream is critical to designing a system that will properly handle, package, store, and dispose of the waste. This report presents a methodology for estimating the radionuclide inventory in irradiated spent fuel hardware. Ratios are developed that allow the use of ORIGEN2 computer code calculations to be applied to regions that are outside the fueled region. The ratios are based on the analysis of samples of irradiated hardware from spent fuel assemblies. The results of this research are presented in three volumes. In Volume 1, the development of scaling factors that can be used with ORIGEN2 calculations to estimate activation of spent fuel assembly hardware is documented. The results from laboratory analysis of irradiated spent-fuel hardware samples are also presented in Volume 1. In Volumes 2 and 3, the calculated flux profiles of spent nuclear fuel assemblies are presented for pressurized water reactors and boiling water reactors, respectively. The results presented in Volumes 2 and 3 were used to develop the scaling factors documented in Volume 1. 5 refs., 4 figs., 21 tabs.
Major descriptors: *radioactive wastes -- classification; *spent fuel elements -- packaging
Descriptors: inventories; optimization; spent fuels; volume
Broader Terms: energy sources; fuel elements; fuels; materials; nuclear fuels; radioactive materials; reactor components; reactor materials; wastes
Subject Categories: 420204* -- Engineering -- Shipping Containers
052002 -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E1520* -- Shipping containers
E5200 -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 80

<DIALOG File 103: >
02367728 NOV-89-064410; EDB-89-113701
Title: The development and implementation of a dry active waste (DAW) sorting program at Catawba Nuclear Station
Author(s): Schulte, J.H.; McNamara, P.N.; Post, R.G.
Affiliation: Duke Power Co., Charlotte, NC (US)
Title: Waste management '88
Series/Collection Title: Volume I: Low-level waste
Conference Title: Waste management '88: symposium on radioactive waste management
Conference Location: Tucson, AZ, USA Conference Date: 28 Feb - 3 Mar 1988
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1988 p 423-428
Report Number(s): CONF-880201-
Document Type: Analytic of a Book; Conference literature
Language: English

Journal Announcement: EDB8900
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Duke Power Company, like other nuclear utilities, bears a burdensome radwaste disposal cost that has rapidly escalated during recent years. Dry active waste (DAW) represents approximately 85 % of the total radioactive waste volume shipped to low-level disposal facilities. Sorting waste with less than detectable radioactivity from waste with detectable radioactivity provides a volume reduction (VR) technique that can save significant radwaste disposal costs and conserve dwindling burial space. This paper presents the development and results of a project that was conducted at Catawba Nuclear Station to determine the volume reduction potential from sorting DAW. Guidelines are given so that other utilities can perform a VR potential study on a low cost basis. Based on the results of the DAW VR study, an overall DAW volume radiation program was initiated at Duke Power Company. This program includes personnel training, drumming techniques, bag tracking and equipment purchases for sorting. This program has been fully implemented at Duke Power Company since January 1, 1988 and preliminary results and savings are given.
Major descriptors: low-level radioactive wastes -- classification; *nuclear power plants -- radioactive waste disposal; *personnel -- training; * radioactive waste disposal -- cost
Descriptors: equipment; ground disposal; minimization; radioactive waste facilities; volume
Broader Terms: management; materials; nuclear facilities; power plants; radioactive materials; radioactive wastes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
220501 -- Nuclear Reactor Technology -- Environmental Aspects -- Sitin g
210800 -- Nuclear Power Plants -- Economics
052001 -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5200* -- Waste Disposal
C5210 -- Environmental aspects of siting of nuclear installations
F1100 -- Nuclear Power Economics
E5100 -- Waste Treatment

Citation 81

<DIALOG File 103: >
02367446 NOV-89-064403; EDB-89-113419
Title: Waste classification of a spent fuel assembly cage
Author(s): McCarten, L.; Kapitz, J.; Cline, J.; Hollis, R.; Enegess, D.; Rec, J.; Post, R.G.
Affiliation: Northern States Power Co., Minneapolis, MN (US) Science Applications International Corp., Rockville, MD (US) WasteChem Corp., Paramus, NJ (US)
Title: Waste management '88
Series/Collection Title: Volume I: Low-level waste
Conference Title: Waste management '88: symposium on radioactive waste management
Conference Location: Tucson, AZ, USA Conference Date: 28 Feb - 3 Mar 1988
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1988 p 595-598
Report Number(s): CONF-880201-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8900
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input).
NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Many nuclear plants exhaust their current spent fuel storage capacities before the DOE will be ready to

start spent fuel for disposal. NSP is in that predicament with its Prairie Island plant PI will exhaust its spent fuel storage capacity by the mid-1900's. To meet PI's storage needs, NSP is evaluating the feasibility of full scale implementation of fuel consolidation. The goal of fuel consolidation is to store more fuel in a given space. To achieve this, not only must the fuel rods be reconfigured and repackaged, but it is also necessary to process the cages so that they are not using potential fuel storage space. In this paper, the term cage refers to the structure of the fuel assembly minus all the fuel rods. Although the assembly handling and rod configuring aspects of consolidation have received most attention, cage processing is also a major concern. In addition to concerns about methods of in-pool volume reduction of cages, cost concerns are important. The cost of processing and disposal or storage of cages is critical to overall economic viability of fuel consolidation.
major descriptors: *fuel assemblies -- radioactive waste processing; *nuclear power plants -- spent fuel storage
Descriptors: classification; cost; fuel rods; materials handling; radioactive waste disposal; radioactive wastes
Broader Terms: fuel elements; management; materials; nuclear facilities; power plants; processing; radioactive materials; reactor components; storage; thermal power plants; waste disposal; waste management; waste processing; wastes
Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
050800 -- Nuclear Fuels -- Spent Fuels Reprocessing
052001 -- Nuclear Fuels -- Waste Processing
420204 -- Engineering -- Shipping Containers
INIS Subject Categories: E1510* -- Transport & storage
B1620 -- Spent fuels reprocessing
E5100 -- Waste Treatment
E1520 -- Shipping containers

Citation 82

<DIALOG File 103: >
02345216 EDB-89-091185
Author(s): Kocher, D.C.
Title: Waste classification - history, standards, and requirements for disposal
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 34. annual meeting of the Health Physics Society
Conference Location: Albuquerque, NM, USA Conference Date: 25 Jun 1989
Publication Date: 27 Jun 1989 p 83
Report Number(s): CONF-890619-2
Order Number: DE89013705
Contract Number (DOE): AC05-84OR21400
Note: Portions of this document are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA8900
Availability: NTIS, PC A05/MF A01 - OSTI; 1.
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: This document contains an outline of a presentation on the historical development in US of different classes (categories) or radioactive waste, on laws and regulations in US regarding classification of radioactive wastes; and requirements for disposal of different waste classes; and on the application of laws and regulations for hazardous chemical wastes to classification and disposal of naturally occurring and accelerator-produced radioactive materials; and mixed radioactive and hazardous chemical wastes.
major descriptors: *historical aspects; *radioactive wastes -- classification
Descriptors: hazardous materials; materials handling; regulations
Broader Terms: materials; radioactive materials; wastes

Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 83

<DIALOG File 103: >
02343661 NOV-89-056241; INS-89-014887; EDB-89-089629
Title: Transportation of tritiated waste from fusion facilities
Author(s): Gruetzmacher, K.M.; Carlson, R.V.; Stencel, J.R.; Sissingh, R.A.P.
Affiliation: Los Alamos National Lab., Los Alamos, NM (US) Princeton Plasma Physics Lab., Princeton, NJ (US) Ontario Hydro, Toronto, Ontario (CA)
Source: Fusion Technol. (United States) v 14:2. Coden: FUSTE
Publication Date: Sep 1988 p 966-971
Document Type: Journal Article
Language: English
Journal Announcement: ERA8900
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Abstract: This paper examines methods of handling tritiated waste from a fusion facility. Gaseous effluent from a fusion reactor can currently be transported from a fusion facility in two forms - as a gas or solidified on uranium beds. Tritiated water can be transported if it is solidified by adsorption onto molecular sieve beds or on clay or cement. Solid waste being shipped for disposal can be transported in low specific activity (LSA, less than 0.3 mCi/g (1.1x10/sup 7/ Bq/g)), type A (less than or equal to 1000 Ci (3.7x10/sup 13/ Bq)) or type B (greater than 1000 Ci (3.7x10/sup 13/ Bq)) standard containers. The method chosen for transport depends on the amount and level of activity of the tritiated material and whether or not it will be reprocessed at another facility.
major descriptors: *gaseous wastes -- molecular sieve process; *radioactive waste disposal; *radioactive waste processing; *radioactive wastes -- classification; *radioactive wastes -- containers; *TFTR tokamak -- radioactive waste processing
Descriptors: adsorption; cements; clays; environmental transport; standards; tritium; uranium
Broader Terms: actinides; beta decay radioisotopes; beta-minus decay radioisotopes; building materials; elements; hydrogen isotopes; isotopes; light nuclei; management; mass transfer; materials; metals; nuclei; odd-even nuclei; processing; radioactive materials; radioisotopes; sorption; thermonuclear reactors; tokamak type reactors; waste disposal; waste management; waste processing; wastes; years living radioisotopes
Subject Categories: 700206* -- Fusion Power Plant Technology -- Environmental Aspects
052001 -- Nuclear Fuels -- Waste Processing
420204 -- Engineering -- Shipping Containers
INIS Subject Categories: C5240* -- Environmental safety of nuclear installations
E5100 -- Waste Treatment
E1520 -- Shipping containers

Citation 84

<DIALOG File 103: >
02337146 AIX-20-046371; EDB-89-083114
Title: United States Department of Energy defence low level waste classification: Basis and application
Author(s): Halford, D.K.
Affiliation: Idaho National Engineering Lab., Idaho Falls (USA)
Title: Management of low and intermediate level radioactive wastes 1988. V.1. Proceedings of an international symposium held in Stockholm, 16-20 May 1988
Series/Collection Title: Proceedings series

Corporate Source: International Atomic Energy Agency, Vienna (Austria) Commission of the European Communities, Brussels (Belgium)
Conference Title: IAEA-ECC international symposium on the management of low and intermediate level radioactive wastes
Conference Location: Stockholm, Sweden Conference Date: 16 May 1988
Publisher: IAEA,Vienna, Austria
Publication Date: 1989 p v. 1
Report Number(s): CONF-880510-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ETD8900
Subfile: ETD (Energy Technology Data Exchange). INIS (non-US Atomindex input AIX)
Country of Origin: International Atomic Energy Agency <IAEA>
Country of Publication: International Atomic Energy Agency <IAEA>
Abstract: As part of the revision of United States Department of Energy (DOE) Order 5820.2, Chapter III, a process for developing a site specific low level radioactive waste (LLW) classification system for DOE defence LLW is being considered. Waste classification is a mechanism that can help ensure that overall performance objectives established to protect public health and ensure public safety will be met. The DOE follows the guidance of the National Council on Radiation Protection and Measurements (NCRP) to the fullest extent practicable with respect to radiation protection standards. The NCRP endorses most of the recommendations of the International Commission on Radiological Protection (ICRP). Thus, the DOE has adopted ICRP 30 and ICRP 48 as the basis for all internal dose calculations. For LLW management practices, the DOE is requiring equivalence with US Nuclear Regulatory Commission (NRC) requirements. However, system-wide classification will be less practical for the DOE than the NRC because of dissimilarities of waste mixtures and disposal methods between DOE sites. Site specific waste stream characterization, source term determination and radiological performance assessment will be required for DOE disposal facilities to determine the maximum disposal capacity and the most efficient disposal practices for defence LLW. This process will also demonstrate compliance with the overall performance objectives, thus providing the public health and safety. The paper discusses the procedure that the DOE is considering in the development of a site and waste specific LLW classification system for DOE defence wastes. (author). 10 refs, 1 tab.
major descriptors: *low-level radioactive wastes -- specifications; *US DOE -- low-level radioactive wastes
Descriptors: environmental impacts; performance testing; radiation protection; radioactive waste facilities; safety; site selection
Broader Terms: materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; testing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management
C5240 -- Environmental safety of nuclear installations

Citation 85

<DIALOG File 103: >
02336431 NOV-89-053478; INS-89-014031; ERA-14-030077; EDB-89-082397
Title: Activation characteristics of different steel alloys proposed for near term fusion reactors
Author(s): Attaya, H.; Gohar, Y.; Smith, D.; Baker, C.
Affiliation: Argonne National Lab., Argonne, IL (US)
Conference Title: 8. topical meeting on technology of fusion energy
Conference Location: Salt Lake City, UT, USA Conference Date: 9 Oct 1988
Source: Fusion Technol. (United States) v 15:2. Coden: FUSTE
Publication Date: Mar 1989 p 893-899
Report Number(s): CONF-881031-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ETD8900

Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Abstract: Analyses have been made for different structural alloys proposed for the International Thermonuclear Experimental Reactor (ITER). Candidate alloys include austenitic steels stabilized with nickel (NiSS) or manganese (MnSS). The radioactivity, the decay heat, and the US waste disposal rating of each alloy have been calculated for the inboard shield of the ITER design option utilizing water cooled solid breeder blanket. The results show, for the .55 m thick inboard shield and after 3 MW.yr/m2 fluence, that the long term activation problems, e.g. radioactive waste, of the MnSS are much less than that of the NiSS. All the MnSS alloys considered are qualified as Class C or better low level waste. Most of the NiSS alloys are not qualified for near surface burial. However, the short term decay heat generation rate for the MnSS is much higher than that of the NiSS.
major descriptors: *austenitic steels -- activation analysis; *experimental reactors -- shields; *low-level radioactive wastes -- classification; * shields -- materials testing
Descriptors: breeder reactors; breeding blankets; calculation methods; ground disposal; international cooperation; manganese alloys; nickel alloys; radiative decay; radioactive waste disposal; radioactive waste processing; radioactivity; stabilization; water cooled reactors
Broader Terms: alloys; chemical analysis; cooperation; iron alloys; iron base alloys; management; materials; processing; radioactive materials; radioactive wastes; reactor components; reactors; research and test reactors; steels; testing; waste disposal; waste management; waste processing; wastes
Subject Categories: 700209* -- Fusion Power Plant Technology -- Component Development & Materials Testing
700206 -- Fusion Power Plant Technology -- Environmental Aspects
INIS Subject Categories: A1428* -- Fusion power plant technology -- Component development & materials studies
C5240 -- Environmental safety of nuclear installations

Citation 86

<DIALOG File 103: >
02323199 ERA-14-026352; EDB-89-068941
Author(s): Mezga, L.J.
Title: (IAEA consultants' meeting on radioactive waste management, Vienna, Austria, February 27--March 3, 1989): Foreign trip report
Corporate Source: Oak Ridge Gaseous Diffusion Plant, TN (USA)
Publication Date: 20 Mar 1989 p 8
Report Number(s): K/ESH/FTR-1
Order Number: DE89010622
Contract Number (DOE): AC05-84OT21400
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: NTS8900
Availability: NTIS, PC A02/MF A01 - OSTI; 1.
Subfile: NTS (NTIS); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: The traveler participated in the consultants' meeting resulting in the development of drafts, ''Radioactive Waste Classification'' and ''Technical Paper in Support of the Code of Practice on Transboundary Shipments of Radioactive Wastes.'' In the first paper, high-, intermediate- and low-level solid, gaseous, and liquid wastes are classified according to hazard and half-life based principally upon existing IAEA classification systems. In the second paper, technical background information regarding radioactive wastes and an assessment of current transboundary shipments are provided. In addition, a series of technical principles to be considered when establishing a Code of Practice are provided.
Major descriptors: *alpha-bearing wastes -- classification; *high-level radioactive wastes -- classification; *low-level radioactive wastes -- classification

Descriptors: austria; design; health hazards; meetings; standards; travel
Broader Terms: europe; hazards; materials; radioactive materials; radioactive wastes; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 87

<DIALOG File 103: >
02323171 ERA-14-026322; EDB-89-068913
Author(s): Wilkinson, D.R.
Title: INEL low-level radioactive waste acceptance criteria: Revision 3
Corporate Source: USDOE Idaho Operations Office, Idaho Falls, ID (USA)
Publication Date: Mar 1987 p 104
Report Number(s): DOE/ID-10112-Rev.3; MISC-89014
Order Number: DE89011149
Contract Number (DOE): AC07-76ID01570
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: NTS8900
Availability: NTIS, PC A06/MF A01 - OSTI; 1.
Subfile: NTS (NTIS); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
country of publication: united states
Abstract: This document delineates the criteria for: shipping low-level waste (LLW) to the Radioactive Waste Management Complex (RWMC), and shipping LLW to the Waste Experimental Reduction Facility (WERF) for metal recycling or volume reduction. General information concerning disposal of contaminated waste materials is contained in Section 1. Two categories of waste are defined in Section 2. General criteria pertaining to all waste is summarized in Section 3. Processable waste classifications are identified in Section 4. Nonprocessable, direct disposal, waste classifications are identified in Section 5. Section 6 presents a list of the required documentation that must accompany each shipment of waste. Standard containers acceptable for shipping waste to the RWMC and WERF are described in Section 7.
Major descriptors: *low-level radioactive wastes -- ground disposal; *regulations -- modifications; *volume -- minimization
Descriptors: classification; compliance; radioactive waste management; standards; transport
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
293000 -- Energy Planning & Policy -- Policy, Legislation, & Regulation

Citation 88

<DIALOG File 103: >
02300037 AIX-20-027170; ERA-14-019364; EDB-89-045775
Author(s): Park, Hun Hwee; Kim, Joon Hyung; Kim, Hwan Young; Seo, Yong Chil; Jung, Ki Jung; Kim, Jeong Guk; Kim, In Tae; Kim, Ki Hong; Yang, Hee Chul; Lee, Kune Woo and others
Title: Techniques for the evaluation of radioactive waste forms
Corporate Source: Korea Advanced Energy Research Inst., Daeduk (Republic of Korea)
Publication Date: May 1987 p 485
Report Number(s): KAERI/RR-699/86
Order Number: DE88706102

Document Type: Report
Language: Korean
Journal Announcement: ETD8960
Availability: NTIS (US Sales Only), PC A21/MF A01 - OSTI; INIS.
Subfile: ETD (Energy Technology Data Exchange); NTS (NTIS); ERA (Energy Research Abstracts). INIS (non-US Atomindex input AIX)
Country of Origin: Korea, South
Country of Publication: Korea, South
Abstract: Before disposal of the radioactive waste packages, waste forms must meet some requirements to facilitate handling and to provide protection and safety of personnel during transportation, storage and disposal. And they must have the structural stability until the end of the cooling period on radioactivity in disposal site. Evaluation and characterization of waste forms are very important tools to check out satisfaction for such requirements and to analyze environmental effects of them. First of all, the waste classifications in foreign countries based on disposal were considered to develope the techniques for evaluating radioactive waste forms. And the requirements were grouped two and discussed. 'handling stability requirements' that all waste forms should have for facilitating handling and providing protection and safety of personnel during all steps in management, and 'storage and disposal stability requirements' that they should meet as long as protentially harmful levels of radioactivity exist in repository. Next, the test items were selected based on characteristics of the actual waste form. The selected test methods were standardized with Korea Standard(KS), and in case of other items which has not shown is KS, the generally known foreign test methods for radioactive waste forms were chosen. The description of test methods refered to 'Manual for evaluation of plastic waste forms (1984)' published by 'Study group on manual for evaluation of plastic waste forms'in Japan. From above test methods, The test items applied to solidification technique and/or disposal and evaluation methods to be necessary in development of solidification matrix and processes were suggested.
Major descriptors: *radioactive waste processing -- solidification; *radioactive waste processing -- waste forms
Descriptors: evaluation; inspection; packaging; radioactive wastes; testing
Broader Terms: management; materials; phase transformations; processing; radioactive materials; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal

Citation 89

<DIALOG File 103: >
02294509 DE-89-002526; EDB-89-040246
Author(s): Birn, H.; Jung, G.
Title: Waste management legislation in practice. Vol. 1-3. Legislation as of October 1988
Original Title: Abfallbeseitigungsrecht fuer die betriebliche Praxis. Bd. 1-3. Rechtsstand Oktober 1988
Publisher: WEKA Fachverlage,Kissing, Germany, F.R.
Publication Date: 1988 p v
Note: Loose-leaf collection
Document Type: Book; Legislative material
Language: German
Journal Announcement: ETD8974
Subfile: ETD (Energy Technology Data Exchange). DE (Federal Republic of Germany (sent to DOE from))
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: The reference book comments on legal regulations, court decisions, and legal ordinances and presents catalogues of economical and legally acceptable waste management measures derived from the legal specifications. Among others, the three volumes of the manual present concrete hints on how to meet the new requirements (e.g. as stated by the TA-Abfall) concerning the avoiding of waste production, the utilisation of waste, or the more rigid speicifications on PCB waste disposal including information on waste treatment and disposal facilities and transport.

The book contains the full-text form sheet of the regulations on waste classification and registration. The waste catalogue with addresses of central waste management and disposal facilities is supplemented by special reports on topics of immediate interest, e.g. dioxins, PCB waste, etc. Loose-leaf supplements will appear at regular intervals. Vol. 1: Waste Management Law, information on waste specification. Vol. 2: Laender legislation, related legal fields. Vol. 3: Related legal fields, current information, waste management problems, data sheets. (orig./Hsch).
Major descriptors: *waste disposal acts -- federal republic of germany
Descriptors: courts; hazardous materials; industry; information; legal aspects; legislative text; pollution laws; pollution regulations; radioactive waste management; sewage sludge; waste storage
Broader Terms: europe; laws; management; materials; regulations; sewage; sludges; storage; waste management; wastes; western europe
Subject Categories: 320305* -- Energy Conservation, Consumption, & Utilization -- Industrial & Agricultural Processes -- Industrial Waste Management

Citation 90

<DIALOG File 103: >
02273657 EDB-89-019391
Author(s): Clements, T.L. Jr.
Title: Technologies for sorting, assaying, classifying, and certifying transuranic waste within the United States
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: IAEA-ECC international symposium on the management of low and intermediate level radioactive wastes
Conference Location: Stockholm, Sweden Conference Date: 16 May 1988
Publication Date: 1988 p 8
Report Number(s): EGG-M-42387; CONF-880510-4
Order Number: DE89005270
Contract Number (DOE): AC07-76ID01570
Note: Portions of this document are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA8900
Availability: NTIS, PC A02/MF A01 - OSTI; 1.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: A major objective of the US Department of Energy (DOE) Defense Waste Management Program is the proper management of defense generated Transuranic (TRU) waste. To meet this objective for newly-generated and stored TRU waste, the Waste Isolation Pilot Plant (WIPP), a deep geological repository, is being constructed for disposal of these wastes. Nondestructive examination and assay technologies have been developed, primarily for stored TRU waste, to evaluate waste package compliance with Waste Acceptance Criteria (WAC) requirements before shipment to WIPP. At the Idaho National Engineering Laboratory (INEL), the Stored Waste Examination Pilot Plant (SWEPP) was developed to provide nondestructive examination and assay techniques for examining and certifying TRU wastes without opening the waste container. These techniques include real-time x-ray radiography, passive and active neutron assay, and ultrasonic container integrity examination. These techniques provide the necessary information to ensure safe transportation, handling, and disposal of the waste at WIPP. 1 ref., 3 figs.
Major descriptors: *alpha-bearing wastes -- classification; *nondestructive analysis -- evaluation
Descriptors: certification; construction; containers; radioactive waste management; waste forms; WIPP
Broader Terms: chemical analysis; functional models; management; materials; national organizations; nuclear facilities; pilot plants; radioactive materials; radioactive waste facilities; radioactive wastes; underground facilities; US DOE; waste management; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
053000 -- Nuclear Fuels -- Environmental Aspects

Citation 91

<DIALOG File 103: >
02239992 INS-88-035493; ERA-14-000180; EDB-88-182736
Title: New requirements for waste stream characterization
Author(s): Fauver, S.L.
Affiliation: Reynolds Electrical and Engineering Co., Inc., Las Vegas, NV (USA)
Title: Proceedings of the ninth annual DOE low-level waste management forum: Technical session 4, Waste characterization and verification
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 9. annual low-level radioactive waste management program conference
Conference Location: Denver, CO, USA Conference Date: 25 Aug 1987
Publication Date: Feb 1988 p 72-82
Report Number(s): CONF-870859-Pt.4
Order Number: DE88013147
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ETD8811
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Radioactive Waste Management Project (RWMP) is responsible for the operation, maintenance, and surveillance of radioactive waste management sites at the Nevada Test Site (NTS). Since FY 1978, the RWMP has managed over eight million cubic feet of defense low-level wastes (LLW) generated both on site and offsite. RWMP operates two principal facilities. Packaged LLW is disposed by shallow land burial (SLB) or greater confinement disposal (GCD). Pits and trenches, ranging in 20 to 30-foot depths and 120-foot augered shafts, are used for the disposal of packaged wastes. Bulk LLW is disposed in subsidence craters in a landfill operation. 97% of all packaged wastes received at NTS are generated offsite. 98% of all bulk wastes received result from NTS Waste Consolidation Project efforts. Since its initiation in 1976, the Waste Consolidation Project has removed over four million cubic feet of soil and debris from inactive waste storage sites located at NTS for disposal at the Radioactive Waste Management Site (RWMS). This paper describes the Radioactive Waste Management Information System used to meet low-level waste reporting requirements.
Major descriptors: *low-level radioactive wastes -- classification; *nevada test site -- radioactive waste facilities; *radioactive waste facilities -- information systems
Descriptors: ground disposal; radioactive waste disposal; reporting requirements; underground disposal
Broader Terms: management; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; US DOE; US organizations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 92

<DIALOG File 103: >
02239991 INS-88-035492; ERA-14-000179; EDB-88-182735
Title: Characterization of waste streams on the Oak Ridge Reservation
Author(s): Rivera, A.L.; Osborne-Lee, I.W.; Butcher, B.T. Jr.; Jackson, A.M.; Van Cleve, J.E Jr.
Affiliation: Oak Ridge National Lab., TN (USA)
Title: Proceedings of the ninth annual DOE low-level waste management forum: Technical session 4, Waste characterization and verification
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 9. annual low-level radioactive waste management program conference

Conference Location: Denver, CO, USA Conference Date: 25 Aug 1987
Publication Date: Feb 1988 p 56-71
Report Number(s): CONF-870859-Pt.4
Order Number: DE88013147
Contract Number (DOE): AC05-84OR21400
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ETD8811
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: For the foreseeable future, the Oak Ridge Reservation (ORR) plants will generate solid low-level waste (LLW) that must be disposed of or stored on-site. The available disposal capacity of the current sites is projected to be fully utilized during the next decade. During the 1980s, several factors coincided which made the process of developing new disposal sites significantly more difficult. An LLW disposal strategy has been developed by the Low-Level Waste Disposal Development and Demonstration (LLWDDD) Program as a framework for bringing new, regulator-approved disposal capacity to the ORR. An increasing level of waste stream characterization will be needed to maintain the ability to effectively manage solid LLW by the facilities on the ORR under the new regulatory scenario. In this paper, current practices for solid LLW stream characterization, segregation, and certification are described. In addition, the waste stream characterization requirements for segregation and certification under the LLWDDD Program strategy are also examined.
Major descriptors: *low-level radioactive wastes -- classification; *oak ridge reservation -- low-level radioactive wastes
Descriptors: compacting; hazardous materials; measuring methods; ORGDP; ORNL; radioactive waste disposal; radioactive waste facilities; sampling; sanitary landfills; solid wastes; sorting; Y-12 plant
Broader Terms: gaseous diffusion plants; industrial plants; isotope separation plants; management; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 93

<DIALOG File 103: >
02239989 INS-88-035490; ERA-14-000174; EDB-88-182733
Title: Low-level waste classification system
Author(s): Halford, D.K.; Kennedy, W.E.; Farris, W.T.
Affiliation: EG and G Idaho, Inc., Idaho Falls (USA)
Title: Proceedings of the ninth annual DOE low-level waste management forum: Technical session 4, Waste characterization and verification
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 9. annual low-level radioactive waste management program conference
Conference Location: Denver, CO, USA Conference Date: 25 Aug 1987
Publication Date: Feb 1988 p 1-6
Report Number(s): CONF-870859-Pt.4
Order Number: DE88013147
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ETD8811
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input).

JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: As part of the revision of Department of Energy (DOE) Order 5820.2, Chapter III, a low-level radioactive waste (LLW) classification system is being developed. The waste classification system is designed to protect the public from short-term and long-term risk from radiation exposure during the waste management process which includes operational, closure, surveillance/observation, active institutional control and passive institutional control periods at the waste management site. The LLW classification system developed for DOE LLW disposal sites is being based on the scenarios and assumptions identified by the Nuclear Regulatory Commission (NRC) for 10 CFR 61 and use of the recommendations of the ICRP 26 and 30, as adopted by the DOE. Use of ICRP 26 and 30 led to DOE intruder dose performance objectives of 100 mrem/yr effective dose equivalent (EDE) for continuous exposures and 500 mrem/yr EDE for short-term exposures (NRC used 500 mrem/yr dose equivalent for all intruder scenarios), and the DOE (ICRP 30 based) internal dose conversion factors (versus the NRC (ICRP 2 based) dose conversion factors). The DOE waste classification system guidelines, being developed from the DOE performance objectives and ICRP 30 dose conversion factors, will be more conservative than their NRC counterparts. Two waste classes (as opposed to three used by the NRC) are also being considered. The development of the DOE waste classification system, the differences and similarities between the NRC and DOE system and the potential ramifications are discussed.
major descriptors: *low-level radioactive wastes -- classification
Descriptors: carbon 14; cesium 137; cobalt 60; health hazards; maximum permissible dose; public health; radiation doses; radioactive waste disposal; radioactive waste facilities; stability; strontium 90; tritium; uranium isotopes; US DOE; US NRC
Broader Terms: actinide isotopes; alkali metal isotopes; alkaline earth isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cesium isotopes; cobalt isotopes; doses; even-even nuclei; hazards; hydrogen isotopes; intermediate mass nuclei; internal conversion radioisotopes; isomeric transition isotopes; isotopes; light nuclei; management; materials; minutes living radioisotopes; national organizations; nuclear facilities; nuclei; odd-even nuclei; odd-odd nuclei; radioactive materials; radioactive wastes; radioisotopes; safety standards; standards; strontium isotopes; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 94

<DIALOG File 103: >
02239906 INS-88-035428; ERA-14-000175; EDB-88-182650
Title: Ontario Hydro's radioactive waste characterization program and its application to waste management
Author(s): Dalziel, B.P.; Krasznai, J.P.; Krochmalnek, L.S.; Williamson, A.S.
Affiliation: Ontario Hydro, Toronto (Canada)
Title: Proceedings of the ninth annual DOE low-level waste management forum: Technical session 4, Waste characterization and verification
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 9. annual low-level radioactive waste management program conference
Conference Location: Denver, CO, USA Conference Date: 25 Aug 1987
Publication Date: Feb 1988 p 7-19
Report Number(s): CONF-870859-Pt.4
Order Number: DE88013147
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ETD8811
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input).
JMT (DOE contractor)
Country of Origin: Canada

Country of Publication: United States
Abstract: By the 1990s, 14.5 GW(e) of Ontario Hydro's generating capacity will be provided by the CANDU (CANadian DEUterium) pressurized heavy water reactor system. It is estimated that based on existing waste treatment facilities about 2000 m/sup 3/ of processed and unprocessed solid radioactive waste will be generated per year during this period. In addition to these routinely generated waste streams, there are periodic large scale maintenance programs, decontaminations and chemical cleaning efforts which will cause transient increases in the chronic waste generation rate. Until a permanent disposal facility is available all radioactive waste is placed in engineered storage systems located at the Bruce Nuclear Power Development (BNPD) site. Recognizing the long term benefits of knowing the chemical and radiochemical composition of the various waste streams, Ontario Hydro undertook to systematically characterize the low and intermediate level waste generated. This paper describes the methods used, the results of the investigations and the end uses of this information.
Major descriptors: *intermediate-level radioactive wastes -- classification; *low-level radioactive wastes -- classification
Descriptors: alpha detection; alpha-bearing wastes; ashes; beta detection; carbon 14; cesium 137; chemical analysis; cobalt 60; compacting; cotton; gamma detection; gamma spectroscopy; incinerators; inventories; ion exchange materials; liquid wastes; measuring methods; nuclear power plants; ontario; paper; plastics; radioactive waste management; radioac tive waste storage; radiochemical analysis; rubbers; solid wastes; sort ing; storage facilities; strontium 90; tritium
Broader Terms: alkali metal isotopes; alkaline earth isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; canada; carbon isotopes; cesium isotopes; charged particle detection; chemical analysis; cobalt isotopes; detection; elastomers; even-even nuclei; hydrogen isotopes; intermediate mass nuclei; internal conversion radioisotopes; isomeric transition isotopes; isotopes; light nuclei; management; materials; minutes living radioisotopes; north america; nuclear facilities; nuclei; odd-even nuclei; odd-odd nuclei; organic compounds; organic polymers; petrochemicals; petroleum products; polymers; power plants; quantitative chemical analysis; radiation detection; radioactive materials; radioactive wastes; radioisotopes; residues; spectroscopy; storage; strontium isotopes; synthetic materials; thermal power plants; waste management; waste storage; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 95

<DIALOG File 103: >
02239902 INS-88-035424; ERA-14-000159; EDB-88-182646
Title: Revision of DOE Order 5820.2 Chapter III. Management of low-level waste
Author(s): Logan, J.A.; Dolenc, M.R.; Halford, D.K.; Kennedy, W.E. Jr.
Affiliation: EG and G Idaho, Inc., Idaho Falls (USA)
Title: Proceedings of the ninth annual DOE low-level waste management forum: Technical session 2, Institutional and regulatory issues
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 9. annual low-level radioactive waste management program conference
Conference Location: Denver, CO, USA Conference Date: 25 Aug 1987
Publication Date: Feb 1988 p 80-84
Report Number(s): CONF-870859-Pt.2
Order Number: DE88013145
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ETD8811
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); ERA (Energy Research Abstracts); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States

Abstract: The purpose of the revision of Chapter III is to increase its scope of coverage, from providing little more than guidance for the disposal of low-level waste (LLW), to defining DOE's overall policies covering all aspects of the management of DOE's low-level waste, and providing prescriptive requirements covering waste generation (including minimization), treatment, storage and disposal. The revised Chapter III, Low-Level Waste Management, will: (1) implement applicable EPA standards; (2) provide performance objectives to guarantee the health and safety of the: off-site population, intruder (archaeologist, builder), and water resources of nearby residents; (3) address entire waste management system - generation through long-term care; (4) accommodate site differences between the sites; (5) be enforceable and auditable by DOE and its water disposers; and (6) be cost effective to taxpayer. The program draft is in final revision and has been discussed with DOE-HQ and with disposal site representatives. The approach for DOE waste classification system has been agreed to and the preliminary system has been drafted.
Major descriptors: *low-level radioactive wastes -- radioactive waste management; *radioactive waste management -- regulatory guides
Descriptors: amendments; contamination regulations; cost; modifications; public health; radioactive waste disposal; radioactive waste processing; radioactive waste storage; US DOE; US EPA
Broader Terms: document types; management; materials; national organizations; pollution regulations; processing; radioactive materials; radioactive wastes; regulations; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5000* -- Waste Management
F2200 -- Nuclear Law -- Nuclear Installations

Citation 96

<DIALOG File 103: >
02217719 EDB-88-160460
Author(s): Halford, D.K.
Title: DOE defense low-level waste classification: Basis and application
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: International symposium on the management of low and intermediate level radioactive wastes
Conference Location: Stockholm, Sweden Conference Date: 16 May 1988
Publication Date: 1988 p 7
Report Number(s): EGG-M-88092; CONF-880510-3; IAEA-SM-3-3/130
Order Number: TI88015117
Contract Number (DOE): AC07-76ID01570
Note: Portions of this document are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA
Availability: NTIS, PC A02/MF A01; 1.
Subfile: ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: A process for developing a site-specific low-level radioactive waste (LLW) classification system for Department of Energy (DOE) defense LLW is being considered. Waste classification is a mechanism that can help ensure that overall performance objectives established to protect public health and safety, will be met. DOE has adopted ICRP 30 and ICRP 48 as the bases for all internal dose calculations. For LLW management, DOE is requiring equivalency with Nuclear Regulatory Commission (NRC) requirements. However, system- wide classification will be less practical for DOE than NRC because of dissimilarities of waste mixtures between DOE sites. Site-specific waste stream characterization, source-term determination, and radiological performance assessment will be required for DOE disposal facilities to determine the maximum disposal capacity and the most efficient disposal practices for defense LLW. This process will also demonstrate compliance with the overall performance objectives, thus providing for public health and safety. This paper discusses the procedure that DOE is considering

in the development of a site- and waste-specific LLW classification system for DOE defense wastes. 10 refs., 1 tab.
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: compliance; dose equivalents; evaluation; intrusion; planning; radiation protection; radioactive waste management; regulations; risk assessment; site characterization
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
560151 -- Radiation Effects on Animals -- Man

Citation 97

<DIALOG File 103: >
02195605 NOV-88-019448; EDB-88-138343
Title: 10CFR61 waste form conformance program for asphalted radwaste
Author(s): Kobran, M.J.; Guarini, W.J.; Oyen, L.C.; Platt, A.M.; Tosetti, R.J.; Feizollahi, F.
Affiliation: Engineering and Plant Betterment, Public Service Electric and Gas, Hancocks Bridge, NJ (US)
Title: Proceedings of the 1987 international waste management conference
Conference Title: International waste management conference
Conference Location: Kowloon, China Conference Date: 29 Nov 1987
Publisher: American Society of Mechanical Engineers,New York, NY
Publication Date: 1987 p 133-138
Report Number(s): CONF-871102-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8808
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: With the enactment of Title 10, Code of Federal Regulation, Part 61, ''Licensing Requirements for Land Disposal of Radioactive Waste'' came the imposition of new requirements on licensees who dispose of radioactive waste via shallow land burial. Specifically, 10CFR61 both imposed a waste classification system requiring segregation of waste according to hazard and established waste performance characteristics required to enhance stability of the burial site. In order to provide licensees with guidance regarding implementation of applicable requirements of 10CFR61, the NRC low level Waste Licensing Branch issued two Technical Positions. To demonstrate compliance of asphalted radwaste produced with oxidized asphalt with 10CFR61 criteria and the NRC's Technical Position, five utilities combined resources. The five utilities sponsoring the program were Public Service Electric and Gas Company, Niagara Mohawk Power Company, Detroit Edison Company, New Hampshire Yankee, and Consumers Power Comany.
Major descriptors: *ground disposal -- licensing; *radioactive waste management -- regulations; *radioactive waste management -- technology assessment; *radioactive wastes -- classification; *radioactive wastes -- government policies; *radioactive wastes -- ground disposal
Descriptors: asphalts; computer codes; low-level radioactive wastes; US NRC
Broader Terms: bitumens; management; materials; national organizations; organic compounds; other organic compounds; radioactive materials; radioactive wastes; tar; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations
E5000 -- Waste Management

Citation 98

<DIALOG File 103: >
02195552 ERA-13-044807; EDB-88-138290
Author(s): Evans, J.C.
Title: A stable isotope method for reactor decommissioning waste classification: (Final report)
Corporate Source: Pacific Northwest Lab., Richland, WA (USA)
Publication Date: Jul 1987 p 16
Report Number(s): PNL-SA-15161
Order Number: DE88013116
Contract Number (DOE): AC06-76RL01830
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: ETD
Availability: NTIS, PC A03/MF A01; 1.
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input); NTS (NTIS); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: A stable isotope method is proposed for the determination of neutron fluence to highly irradiated components of reactor internals. Experimentally determined neutron fluences could be combined with suitable composition information in an activation code for calculation of long-lived radionuclide inventory and waste classification, as specified by 10 CFR 61. Suitable flux indicators are boron and tungsten. Lithium and selenium are also discussed as less desirable alternatives. The trace element of interest would be chemically separated from a small subsample of the steel component. The isotopic composition of the nonradioactive elemental fraction would be determined by induction coupled argon plasma/mass spectrometry (ICAP/MS). The method offers the advantage of providing reliable waste classification in compliance with the requirements of 10 CFR 61 without the need for offsite shipping of radioactive samples. The formidable problems associated with subsampling of large and highly radioactive reactor components would limit the method to use as a tool for activation-code validation rather than routine classification.
Major descriptors: *radioactive wastes -- stable isotopes; *reactor decommissioning -- radioactive wastes
Descriptors: a codes; boron; classification; cobalt 60; cross sections; iron 55; lithium; neutron fluence; nickel 59; nickel 63; niobium 94; nuclear power plants; progress report; radioactive waste disposal; reactor materials; selenium; tungsten
Broader Terms: alkali metals; beta decay radioisotopes; beta-minus decay radioisotopes; cobalt isotopes; computer codes; decommissioning; document types; electron capture radioisotopes; elements; even-odd nuclei; intermediate mass nuclei; internal conversion radioisotopes; iron isotopes; isomeric transition isotopes; isotopes; management; materials ; metals; minutes living radioisotopes; nickel isotopes; niobium isotopes; nuclear facilities; nuclei; odd-odd nuclei; power plants; rad ioactive materials; radioisotopes; semimetals; thermal power plants; tr ansition elements; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
220502 -- Nuclear Reactor Technology -- Environmental Aspects -- Radioactive Effluents
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 99

<DIALOG File 103: >
02195389 ITAN-88-000006; ERA-13-044780; EDB-88-138127
Author(s): Ricci, G.A.; Donato, A.
Title: Characterization and control of solidified radioactive wastes according to Italian regulations. Organization of a characterization facility and first results
Corporate Source: ENEA, Rome (Italy)
Conference Title: 4. international hazardous waste symposium on environmental aspects of stabilization-solidification

of hazardous and radioactive wastes
Conference Location: Atlanta, GA, USA Conference Date: 3 May 1987
Publication Date: Sep 1987 p 23
Report Number(s): ENEA-RT-COMB-87-8; CONF-870511-
Order Number: DE88754246
Document Type: Report; Numerical data; Conference literature
Language: English
Journal Announcement: ETD8800
Availability: NTIS (US Sales Only), PC A03/MF A01.
Subfile: ETD (Energy Technology Data Exchange); NTS (NTIS); ERA (Energy Research Abstracts). ITAN (Italy (sent to DOE from))
Country of Origin: Italy
Country of Publication: Italy
Abstract: According to the Technica Guide N. 26 officially released this year by the Italian Regulatory Body (ENEA-DISP), radioactive wastes are now classified in Italy in accordance with the identities and the concentrations of radionuclides, no distinction being made from the point of view of physical states. Three radwaste categories have been established. The third one mainly refers to the high activity liquids arising from the first cycle of the fuel reprocessing facilities and to the alpha bearing wastes. The second category radwaste, which is the most important one in terms of overall production, refers to those wastes whose radioactivity decay to radioactive levels is comparable with the exemption limits set up for natural radioactive solids, as a maximum, within a few centuries. The radwastes falling into this second category, which are those radwastes generated mainly by nuclear power plants, must be solidified by means of suitable solidification agents, such as cement, bitumen or polymers. Moreover, a test program must be performed to assure the compliance of the waste forms with a set of specified waste form characteristics. The tests to be applied for the control of characteristics of real radioactive solidified wastes are briefly described. They require, in some cases, the use of non-commercial apparatus to be operated in radiation controlled areas. A glove-box chain, also suitable for the characterization of solidified alpha wastes, has been designed and built. The first characterization test campaign has been carried out on BWR plant produced radwastes solidified in cement. The results obtained are presented.
Major descriptors: *alpha-bearing wastes -- regulations; *high-level radioactive wastes -- solidification; *nuclear power plants -- radioactive waste management; *radioactive waste management -- quality control; *radioactive waste management -- regulations; *radioactive waste processing -- quality control; *radioactive wastes -- classification; * radioactive wastes -- physical properties
Descriptors: BWR type reactors; experimental data; italy; liquid wastes; maximum permissible level; radioactivity; reprocessing; solid wastes; standards; testing
Broader Terms: control; data; europe; information; management; materials; nuclear facilities; numerical data; phase transformations; power plants; processing; radioactive materials; radioactive wastes; reactors; safety standards; separation processes; standards; thermal power plants; waste management; waste processing; wastes; water cooled reactors; water moderated reactors; western europe
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage

Citation 100

<DIALOG File 103: >
02195346 NOV-88-018300; INS-88-027590; EDB-88-138084
Title: The transportation of radioactive waste - A review
Author(s): Salmon, A.; Oyen, L.C.; Platt, A.M.; Tosetti, R.J.; Feizollah I, F.
Affiliation: British Nuclear Fuels, Risley, Warrington, Cheshire (GB)
Title: Proceedings of the 1987 international waste management conference
Conference Title: International waste management conference
Conference Location: Kowloon, China Conference Date: 29 Nov 1987
Publisher: American Society of Mechanical Engineers,New York, NY
Publication Date: 1987 p 359-368

Report Number(s): CONF-871102-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8808
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United Kingdom
Country of Publication: United States
Abstract: The paper reviews the present state and the future of the transportation of radioactive wastes, concentrating on Eastern Asia, Europe and North America. The types of wastes are defined and described and examples of the quantities of each type, arising in various countries are given. The standards that apply to the transportation of the wastes are discussed as are the possible modes of transport. Current and proposed forms of the materials to be moved are described together with some of the designs of packaging for the various types of waste. Particular attention is devoted to high level waste and the packaging that is being developed now. The vehicles which are being used, and those available, are discussed. Especial attention is paid to the movement of wastes by river and sea, both for the transports to a land repository and for disposal at sea. Past experience in this field is depicted together with indicative costs of such transport. The problems of public relations are noted and some possible methods of progress are outlined. Finally the risks are examined, involving both the potential hazards and the probabilities of their occurrence. The paper concludes that the transport of radioactive wastes presents no technical problems which cannot be overcome within the time available. Considerable operational experience of the movement of all types of radioactive materials already exists so a firm base exists for the future development of the necessary transport of radioactive wastes worldwide.
major descriptors: *high-level radioactive wastes -- packaging; *packaging -- design; *radioactive wastes -- classification; *radioactive wastes -- global aspects; *radioactive wastes -- ground disposal; *radioactive wastes -- health hazards; *radioactive wastes -- marine disposal; *radioactive wastes -- risk assessment; *radioactive wastes -- waste transportation; *waste transportation -- global aspects; *waste transportation -- health hazards; *waste transportation -- risk assessment; *waste transportation -- safety standards
Descriptors: public health
Broader Terms: hazards; management; materials; radioactive materials; radioactive wastes; standards; transport; waste disposal; waste management; wastes
Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
  054000 -- Nuclear Fuels -- Health & Safety
  052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E1510* -- Transport & storage
  C5400 -- Radiation Protection Procedures
  E5200 -- Waste Disposal

Citation 101

<DIALOG File 103: >
02171052 NOV-88-007643; INS-88-021826; EDB-88-113786
Title: Development of the remedial action priority system: An improved risk assessment tool for prioritizing hazardous and radioactive-mixed waste disposal sites
Author(s): Whelan, G.; Strenge, D.L.; Steelman, B.L.; Hawley, K.A.
Affiliation: Pacific Northwest Lab., Richland, WA (US)
Title: Management of uncontrolled hazardous waste sites
Conference Title: 6. national conference on management of uncontrolled hazardous waste sites
Conference Location: Washington, DC, USA Conference Date: 4 Nov 1985
Publisher: Hazardous Materials Control Research Institute,Silver Spring, MD
Publication Date: 1985 p 432-437
Report Number(s): CONF-8511122-
Contract Number (DOE): AC06-76RL01830
Document Type: Analytic of a Book; Conference literature
Language: English

Journal Announcement: ERA8806
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Remedial Action Priority System (RAPS) represents a methodology that prioritizes inactive hazardous and radioactive mixed-waste disposal sites in a scientific and objective manner based on limited site information. This methodology is intended to bridge the technology gap that exists between the initial site evaluation using the Hazard Ranking System (HRS) and the time-consuming process of actual field site characterization, assessment and remediation efforts. The HRS was designed as an initial screening tool to discriminate between hazardous waste sites that do not and those that are likely to power significant problems to human health, safety and/or the environment. The HRS is used by the U.S. EPA to identify sites for nomination to the National Priorities List (NPL). Because the HRS is not designed to evaluate sites containing radionuclides, a modified Hazard Ranking System (mHRS) addressing both hazardous and radioactive mixed wastes was developed by Pacific Northwest Laboratory (PNL) for the U.S. Department of Energy (DOE). Neither the HRS nor the mHRS was designed to prioritize sites that are nominated to the NPL according to their potential risks. To provide DOE with a better management tool for prioritizing funding and human resource allocations for further investigations and possible remediations at its inactive waste sites, PNL is developing the risk assessment methodology called RAPS. Use of RAPS will help DOE ensure that those sites posing the highest potential risk are addressed first.
Major descriptors: *ground disposal -- site characterization; *hazardous materials -- classification; *hazardous materials -- ground disposal; * radioactive wastes -- classification; *radioactive wastes -- health hazards
Descriptors: remedial action; risk assessment; US DOE; US EPA
Broader Terms: hazards; management; materials; national organizations; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 320305* -- Energy Conservation, Consumption, & Utilization -- Industrial & Agricultural Processes -- Industrial Waste Management
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 102

<DIALOG File 103: >
02169065 EDB-88-111799
Author(s): Lee, D.W.
Title: Low-level radioactive waste disposal at a humid site
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: Joint CSCE-ASCE conference on environmental engineering
Conference Location: Vancouver, Canada Conference Date: 13 Jul 1988
Publication Date: Mar 1987 p 9
Report Number(s): CONF-880741-3
Order Number: DE88007478
Contract Number (DOE): AC05-84OR21400
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA
Availability: NTIS, PC A02/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); NTS (NTIS). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: Waste management in humid environments poses a continuing challenge because of the potential contamination of groundwater in the long term. Short-term needs for waste disposal, regulatory uncertainty, and unique site and waste characteristics have led to the development of a site-specific waste classification and management system proposed for the Oak Ridge Reservation. The overlying principle of protection of public health

and safety is used to define waste classes compatible with generated waste types, disposal sites and technologies, and treatment technologies. 1 fig., 1 tab.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: compliance; oak ridge reservation; radioactive waste management; regulations
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; us doe; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 103

<DIALOG File 103: >
02156223 EDB-88-098956
Title: Development of acceptance criteria for near-surface disposal of Hanford Defense Waste
Author(s): Wood, D.E.; Huizenga, D.G.; Napier, B.A.
Conference Title: American Nuclear Society annual meeting
Conference Location: Reno, NV, USA Conference Date: 15 Jun 1986
Source: Trans. Am. Nucl. Soc. (United States) v 52. Coden: TANSA
Publication Date: 1986 p 89-90
Report Number(s): CONF-860610-Summs.
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8806
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: The US Dept. of Energy (DOE) is developing specific plans for disposal of Hanford defense waste (HDW). The impacts of alternatives ranging from retrieving all of the transuranic (TRU) and high-level waste (HLW) to disposing of it all near-surface are noted. Even if the waste is retrieved, it will be subject to sorting and additional nuclide partitioning, such that the low-activity fraction may be disposed of near-surface as low-level waste (LLW). Thus, it is necessary to develop acceptance criteria for whatever portion of the waste is determined to be qualified for near-surface disposal, based on decisions resulting from the HDW environmental impact statement. This paper discusses the background and status of criteria development, and gives some of the early results and insights gained from the program.
Major descriptors: *high-level radioactive wastes -- classification; *high-level radioactive wastes -- radioactive waste disposal
Descriptors: comparative evaluations; decay; hanford reservation; low-level radioactive wastes; regulations; transuranium compounds; US DOE; US NRC
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 104

<DIALOG File 103: >
02156216 EDB-88-098949
Title: Characterizing the risk of long-lived radionuclides in waste
Author(s): Cohen, J.J.; Smith, C.F.; Toy, A.J.
Conference Title: American Nuclear Society annual meeting
Conference Location: Reno, NV, USA Conference Date: 15 Jun 1986
Source: Trans. Am. Nucl. Soc. (United States) v 52. Coden: TANSA

Publication Date: 1986 p 37
Report Number(s): CONF-860610-Summs.
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8806
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: Concern regarding the hazard of high-level waste (HLW) disposal stems from the fact that many component radionuclides can have extremely long half-lives. Disposal of HLW has been characterized as a 250,000-yr problem (approx. 10 x the half-life of /sup 239/Pu) and the requirement for its isolation for millennia is viewed as being unique and unprecedented. This perception has resulted in some paradoxical problems. For example, the National Waste Policy Act of 1984 describes HLW as waste that is highly radioactive and requires long term isolation. While it may be reasonable to assume that a requirement for long-term isolation stems from the fact the HLW contains long-lived radionuclides, it is also apparent that any highly radioactive material necessarily cannot have a long half-life. This results from the fact that specific radioactivity is inversely proportional to half-life. The longer its half-life, the less radioactive the material must be. To address such a paradox, it is suggested that simple classification of materials as either radioactive or stable may be inappropriate. Since recent information indicates that the proton itself may disintegrate with an estimate half-life of 10/sup 30/ yr, literally no isotope can be considered completely stable. To accommodate this phenomenon, cation of materials is suggested. Certain useful insights may be derived from a consideration of waste management problems in the framework of the above classification.
Major descriptors: *high-level radioactive wastes -- classification; *high-level radioactive wastes -- half-life
Descriptors: activity levels; cadmium; environmental exposure pathway; fission products; iodine 129; lead; mercury; nuclear power plants; radiation hazards; radioactive waste management; radium; uranium 238
Broader Terms: actinide isotopes; actinide nuclei; alkaline earth metals; alpha decay radioisotopes; beta decay radioisotopes; beta-minus decay radioisotopes; elements; even-even nuclei; hazards; health hazards; heavy nuclei; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; isotopes; management; materials; metals; nuclear facilities; nuclei; odd-even nuclei; power plants; radioactive materials; radioactive wastes; radioisotopes; thermal power plants; uranium isotopes; waste management; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 105

<DIALOG File 103: >
02146551 ERA-13-030083; EDB-88-089283
Title: Waste management system functional requirements for Interim Waste Management Facilities (IWMFs) and technology demonstrations, LLWDDD (Low-Level Disposal Development and Demonstration) Program
Corporate Source: Automated Sciences Group, Inc., Oak Ridge, TN (USA)
Publication Date: Mar 1988 p 51
Report Number(s): ORNL/TM-10737
Order Number: DE88006795
Contract Number (DOE): AC05-84OR21400
Document Type: Report
Language: English
Journal Announcement: NTS
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: The purpose of this report is to build upon the preceding decisions and body of information to prepare draft system functional requirements for each classification of waste disposal currently proposed for Low-Level Waste Disposal Development Demonstration (LLWDDD) projects. Functional requirements identify specific

information and data needs necessary to satisfy engineering design criteria/objectives for Interim Waste Management Facilities. This draft will suppor the alternatives evaluation process and will continue to evolve as strategy is implemented, regulatory limits are established, technical and economic uncertainties are resolved, and waste management plans are being implemented. This document will become the planning basis for the new generation of solid LLW management facilities on new sites on the Reservation. Eighteen (18) general system requirements are identified which are applicable to all four Low-Level Waste (LLW) disposal classifications. Each classification of LLW disposal is individually addressed with respect ot waste characteristics, site considerations, facility operations, facility closure/post-closure, intruder barriers, institutional control, and performance monitoring requirements. Three initial LLW disposal sites have been proposed as locations on the ORR for the first demonstrations.
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- demonstration programs
descriptors: decision making; forecasting; ground disposal; implementation; information needs; oak ridge reservation; planning; program management; solid wastes; standards; volume
Broader terms: management; materials; national organizations; radioactive materials; radioactive wastes; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 106

<DIALOG File 103: >
02146454 ERA-13-030133; EDB-88-089186
Title: Management of low- and intermediate-level wastes in the UK
Author(s): Flowers, R.H.
Affiliation: United Kingdom Atomic Energy Authority, Harwell (England)
Title: Proceedings from the international symposium on alternative low-level waste technologies
Conference Title: Conference on all aspects of low level waste
Conference Location: Chicago, IL, USA Conference Date: 28 Feb 1986
Publisher: Illinois Department of Nuclear Safety,Springfield, IL
Publication Date: 1986 p 197-209
Report Number(s): CONF-860223-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8806
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). JMT(DOE contractor)
Country of Origin: United Kingdom
Country of Publication: United States
Abstract: The organizations responsible for the regulation and implementation of low- and intermediate-level solid radioactive waste disposal in the UK are described. Waste classifications now in use are defined. The quantities of these wastes expected to arise over the next 25 years are estimated and plans for their disposal briefly outlined. The principles upon which the safety of a new trench site will be based are summarized and the current NIREX concepts for the repository are described.
Major descriptors: *intermediate-level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- radioactive waste disposal; *united kingdom -- radioactive waste management
Descriptors: classification; clays; containers; design; forecasting; geology; ground disposal; high-level radioactive wastes; legal aspects; planning; population density; radioactive waste facilities; resource conservation; safety; site selection; transport; volume
Broader Terms: europe; management; materials; nuclear facilities; radioactive materials; radioactive wastes; waste disposal; waste management; wastes; western europe
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 107

<DIALOG File 103: >
02146445 NOV-88-004617; ERA-13-030117; EDB-88-089177
Title: Characterization of spent fuel disassembly hardware and nonfuel bearing components and their relationship to 10 CFR 61
Author(s): Luksic, A.T.; Post, R.G.
Affiliation: Pacific Northwest Lab., Richland, WA 99352 (US)
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 475-482
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8805
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: There are a variety of wastes that will be disposed of by the federal waste management system under the Nuclear Waste Policy Act of 1982. The primary waste form is spent nuclear fuel. Currently, this is in the form of fuel assemblies. If the fuel pins are removed from the fuel assembly, as in consolidation, then the fuel pins and the structural portion of the fuel assembly must be considered as separate waste streams. The structural hardware consists of end fittings, grid spacers, water rods (BWR 8 x 8 only), control rod guide tubes (PWR only) and various nuts, washers, springs, etc. These are referred to as spent fuel disassembly (SFD) hardware. There will also be a number of other components which are defined in Appendix E of 10 CFR 961, the standard utility contract. These are referred to as nonfuel-bearing (NFB) components, and include fuel channels (BWR), control rods, fission chambers, neutron sources, thimble plugs, and other components. This paper characterizes spent fuel disassembly (SFD) hardware, and nonfuel-bearing (NFB) components for the most abundant fuel types. The descriptions and figures given are representative for the items described. Many subvariants exist due to design evaluation, which are not covered. This paper also discusses the relationship of these wastes to 10 CFR 61 waste classification.
Major descriptors: *fuel pins -- radioactive waste management; *radioactive wastes -- classification; *spent fuels -- radioactive waste management
Descriptors: computer codes; fuel reprocessing plants; nuclear waste policy acts; reactor components
Broader terms: energy sources; fuel elements; fuels; laws; management; materials; nuclear facilities; nuclear fuels; radioactive materials; reactor components; reactor materials; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 108

<DIALOG File 103: >
02141175 NOV-88-000306; EDB-88-083906
Title: Low-level radioactive waste generation rates at domestic nuclear power plants - 1982 through 1985 update
Author(s): Coley, R.F.; Post, R.G.
Affiliation: RLD Consulting Inc., 620 Keystone Drive, Bolingbrook, IL 60439-1256 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987

Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 243-248 v
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature; Numerical data
Language: English
Journal Announcement: INS8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: A survey of low-level radioactive waste (LLRW) generation rates at domestic nuclear power plants was conducted from May, 1985 through September, 1985. Data were collected from twenty-two BWR sites (representing thirty-one units) and thirty PWR sites (representing forty-eight units). Actual annual volumes of both solidified or dewatered (WET) wastes and dry active wastes (DAW) were obtained for 1982 through 1984. The corresponding projected values for 1985 were also obtained. Comparisons between the collected data and earlier data reported in EPRI NP-3370 for calendar years 1978 through 1981 were performed and analyzed for correlations, differences, and trends. For purposes of comparing with previously reported EPRI results, both BWR and PWR plants were separated into various groupings. Trends in total LLRW shipped volumes, WET waste shipped volumes, and DAW shipped volumes were developed and compared to the earlier work for both BWR and PWR plants. For each type (BWR or PWR) and subtype various ratios were developed and compared with the corresponding values reported in EPRI NP-3370. The manner in which data treatment methods influence ''typical'' values is discussed for both the earlier EPRI work and the current work. An alternative method is proposed for the analysis of such data and trends.
Major descriptors: *BWR type reactors -- radioactive waste management; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- volume; *nuclear power plants -- low-level radioactive wastes; *PWR type reactors -- radioactive waste management; *radioactive waste management -- compiled data
Descriptors: data analysis; EPRI; evaluation; liquid wastes; radioactive waste disposal; solid wastes
Broader Terms: data; information; management; materials; nuclear facilities; numerical data; power plants; radioactive materials; radioactive wastes; reactors; thermal power plants; waste disposal; waste management; wastes; water cooled reactors; water moderated reactors
Subject Categories: 210100* -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E3100* -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types)
E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)
E5200 - Waste Disposal

Citation 109

<DIALOG File 103: >
02136878 NOV-88-003105; EDB-88-079608
Title: An experimental and analytical evaluation of a type B radioactive transport container
Author(s): Moya, J.L.; Akau, R.L.; McAssey, E.V.; Schrock, V.E.
Affiliation: Sandia National Labs., Albuquerque, NM (USA)
Title: Heat transfer problems in nuclear waste management Series/Collection Title: HTD - Vol. 67
Conference Title: 24. national heat transfer conference and exhibition
Conference Location: Pittsburgh, PA, USA Conference Date: 9 Aug 1987
Publisher: American Society of Mechanical Engineers,New York, NY
Publication Date: 1987 p 37-44
Report Number(s): CONF-870816-
Contract Number (DOE): AC04-76DP00789
Document Type: Analytic of a Book; Conference literature; Numerical data
Language: English

Journal Announcement: ERA8805
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: A thermal test of the Beneficial Uses Shipping System (BUSS) cask containing irradiation source capsules was conducted to verify a two-dimensional axisymmetric thermal model developed for the Safety Analysis Report. The BUSS cask is a Type B package developed to transport irradiation source capsules of cesium chloride or strontium fluoride to commercially licensed food and pharmaceutical irradiating facilities. The Uniqueness of this test is that it was performed on an internally instrumented, full-scale cask with actual radioactive capsules. This results in more realistic system temperatures than those obtained if heaters were used to simulate the large gamma source. In addition, the thermal test provides benchmark data for other thermal codes.
Major descriptors: *casks -- safety standards; *casks -- thermal testing; * high-level radioactive wastes -- casks; *high-level radioactive wastes -- classification; *high-level radioactive wastes -- waste transportation; *radioactive waste storage -- safety standards
Descriptors: analytical solution; benchmarks; cesium chlorides; experimental data; gamma sources; nuclear merchant ships; strontium fluorides; two-dimensional calculations
Broader Terms: alkali metal compounds; alkaline earth metal compounds; cesium compounds; chlorides; chlorine compounds; containers; data; fluorides; fluorine compounds; halides; halogen compounds; information; management; materials; materials testing; nondestructive testing; nuclear ships; numerical data; radiation sources; radioactive materials; radioactive wastes; ships; standards; storage; strontium compounds; testing; transport; waste management; waste storage; wastes
Subject Categories: 420204* -- Engineering -- Shipping Containers
050900 -- Nuclear Fuels -- Transport, Handling, & Storage
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
INIS Subject Categories: E1520* -- Shipping containers
E1510 -- Transport & storage
F4100 -- Safeguards & Inspection -- Technical Aspects

Citation 110

<DIALOG File 103: >
02129801 NOV-88-000305; INS-88-013091; EDB-88-072530
Title: A dose to curie conversion methodology
Author(s): Stowe, P.A.; Post, R.G.
Affiliation: Arizona Nuclear Power Project, Palo Verde Nuclear Generating Station, Phoenix, AZ 85036 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 255-258
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Development of the computer code RadCAT (Radioactive waste Classification And Tracking) has led to the development of a simple dose rate to curie content conversion methodology for containers with internally distributed radioactive material. It was determined early on that, if possible, the computerized dose rate to curie evaluation model employed in RadCAT should yield the same results as the hand method utilized and specified in plant procedures. A review of current industry practices indicated two distinct types of computational methodologies

are presently in use. The most common methods are computer based calculations utilizing complex mathematical models specifically established for various containers geometries. This type of evaluation is tedious, however, and does not lend itself to repetition by hand. The second method of evaluation, therefore, is simplified expressions that sacrifice accuracy for ease of computation, and generally over estimate container curie content. To meet the aforementioned criterion current computer based models were deemed unacceptably complex and hand computational methods to be too inaccurate for serious consideration. The contact dose rate/curie content analysis methodology presented herein provides an equation that is easy to use in hand calculations yet provides accuracy equivalent to other computer based computations.
Major descriptors: *computer codes -- r codes; *containers -- geometry; *nuclear industry -- computerized control systems; *nuclear industry -- computerized simulation; *radioactive materials -- computer codes; *radioactive materials -- computerized control systems; *radioactive materials -- containers; *radioactive materials -- dose rates; *radioactive materials -- storage facilities
Descriptors: computer calculations; curie point; equations; mathematical models; radiation doses
Broader Terms: computer codes; control systems; doses; industry; materials; mathematics; physical properties; simulation; thermodynamic properties; transition temperature
Subject Categories: 220400* -- Nuclear Reactor Technology -- Control Systems
052002 -- Nuclear Fuels -- Waste Disposal & Storage
220100 -- Nuclear Reactor Technology -- Theory & Calculation
INIS Subject Categories: E2400* -- Reactor Control Systems
E5200 -- Waste Disposal
E2100 -- Reactor Theory & Calculation

Citation 111

<DIALOG File 103: >
02129264 NOV-88-002617; EDB-88-071993
Title: Safety requirements for waste packages, the basis for acceptance criteria of the KONRAD repository
Author(s): Wurtinger, W.; Gruendler, D.; Post, R.G.
Affiliation: Gesellschaft fuer Reaktorsicherheit (GRS) mbH, 5000 Koeln (DE)
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 581-586
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: Germany, Federal Republic of
Country of Publication: United States
Abstract: Safety related requirements for the acceptance of waste packages due for final disposal in the repository planned for the Federal Republic of Germany in the KONRAD iron ore mine were derived from site-specific safety analyses. These requirements which will become part of future acceptance requirements were grouped as basic requirements which are independent of the activity inventory and activity inventory dependent requirements. With respect to activity inventories, two waste classes were defined. Waste forms within waste class I have to meet already relatively high standards and are further differentiated into six waste form groups. Waste forms of a higher activity inventory are correlated to waste class II, where the packagings have to be designed to resist incidents. The practical application of the requirements to several waste examples has been proven.
Major descriptors: *packaging -- design; *packaging -- safety standards; *radioactive waste processing -- safeguard regulations; *radioactive waste processing -- site characterization; *radioactive wastes -- classification; *radioactive wastes -- packaging; *radioactive wastes -- safety standards; *radioactive wastes -- storage facilities

Descriptors: federal republic of germany; test facilities
Broader Terms: europe; management; materials; processing; radioactive materials; regulations; standards; waste management; waste processing; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
420204 -- Engineering -- Shipping Containers
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
E1520 -- Shipping containers
F4100 -- Safeguards & Inspection -- Technical Aspects

Citation 112

<DIALOG File 103: >
02129249 NOV-88-000329; INS-88-012986; EDB-88-071978
Title: Considerations in reviewing the waste volume reduction program in a large utility
Author(s): Kohout, R.; Calzolari, L.M.; Post, R.G.
Affiliation: Ontario Hydro, 700 University Avenue, Toronto M5G 1X6 (CA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 13-22
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: Canada
Country of Publication: United States
Abstract: A program is underway at Ontario Hydro to establish a desirable future scheme for central processing/volume reduction of solid radioactive Low-Level Wastes (LLW) prior to their placement into the centralized storage, and in the future into a disposal facility. The approach being investigated is to furnish the current Waste Volume Reduction Facility (WVRF) with state-of-art processes, reclassify the waste categories and segregate the wastes such that each volume reduction (VR) process is then applied where it would be most effective. This ''optimized'' approach is then compared with other, specific schemes, which basically differ in that each scheme omits one of the major VR processes, thus allowing the next most effective process to take over its role. Each scheme is assessed quantitatively from the viewpoint of cost and VR effectiveness, and qualitatively from the viewpoint of resultant waste form. The economic assessments take into consideration the long term (20 year) impact of selected VR schemes on the overall waste management cost, including construction and operation of the storage facility. This paper highlights the overall study, includes the major results, and identifies aspects that need to be addressed in the selection of a desirable combination of VR processes in absence of knowledge of future waste disposal costs.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- minimization; *low-level radioactive wastes -- volume; *ontario -- low-level radioactive wastes; *ontario -- radioactive waste management; *radioactive waste processing -- cost; *radioact ive waste processing -- environmental impacts; *radioactive waste processing -- optimization; *radioactive waste processing -- technology assessment
descriptors: comparative evaluations; data analysis; forecasting; land pollution abatement; pollution control equipment; reviews; storage facilities
Broader Terms: canada; document types; equipment; management; materials; north america; pollution abatement; processing; radioactive materials; radioactive wastes; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing

053000 -- Nuclear Fuels -- Environmental Aspects
INIS Subject Categories: E5200* -- Waste Disposal
E5100 -- Waste Treatment
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations

Citation 113

<DIALOG File 103: >
02129248 NOV-88-000326; INS-88-012985; EDB-88-071977
Title: Middle South Utilities (MSU) LLRW volume reduction evaluation
Author(s): Etheridge, J.L.; Akins, D.W.; Lowman, D.B.; Snell, L.L.; Post, R.G.
Affiliation: Louisiana Power and Light Co. (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 3-8
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The waste volume reduction evaluation was a concerted radwaste review conducted by Middle South Utilities' (MSU) three operating companies and the MSU service company. The objectives of the evaluation were to identify areas of excessive radwaste generation and to make recommendations for cost effective volume reduction. The evaluation team conducted a survey of sixty-six reactor units to obtain data relating to the various waste types of concern. The data collected was used to establish waste type specific average generation rates for each reactor category of interest. The evaluation team was able to pinpoint specific areas of concern by comparing the waste volumes generated by the MSU plants to the industry average waste volumes for similar plants. The results of the evaluation indicated that the radwaste volume reduction efforts demonstrated at the MSU plants were effective; however, significant improvements could be made. In order to implement these improvements, a strong management commitment and active involvement by all concerned departments would be necessary.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- volume; *nuclear industry -- pollution control equipment; *nuclear industry -- radioactive waste disposal; *radioactive waste disposal -- technology assessment
Descriptors: cost benefit analysis; evaluation; recommendations
Broader Terms: equipment; industry; management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
F4200 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 114

<DIALOG File 103: >
02129247 NOV-88-000316; ERA-13-024199; INS-88-012984; EDB-88-071976
Title: Managing greater-than-Class-C low-level waste
Author(s): Smiley, J.L.; Knecht, M.A.; Dressen, A.L.; Serie, P.J.; Post, R.G.

Affiliation: U.S. Dept. of Energy, Washington, DC (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 317-322
Report Number(s): CONF-870306-
Contract Number (DOE): AC07-76ID01570
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Congress has assigned to the Federal Government responsibility to safely dispose of a category of nonDOE low-level radioactive waste classified as "greater-than-Class-C that results from activities licensed by the NRC." Concentrations of radionuclides in this waste exceed the Nuclear Regulatory Commisision (NRC) limits for routine near-surface disposal. A recent Department of Energy (DOE) report to Congress identified the wastes that are in this category, defined issues that must be resolved to safely manage the waste, and proposed an approach to implement the federal responsibility. The volume of this waste is relatively small, but its management presents some unique needs. Those include a clear definition of the waste, improved data on volumes and characteristics of the waste, additional regulatory guidance from NRC and the Environmental Protection Agency, and an assessment of the viability of disposal at nonfederal sites. When these needs have been met, disposal capacity can be developed that will ensure the safe disposal of all waste in this category. In the interim, DOE proposes to explore nonfederal disposal options and, if necessary, accept the waste upon request of the generators, take title to the waste, store it until disposal capacity is available, and ensure its safe disposal with all reasonable costs to be borne by the waste generator or owner.
Major descriptors: *high-level radioactive wastes -- classification; *high- level radioactive wastes -- radioactive waste disposal; *high-level radioactive wastes -- volume; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management; *radioactive waste management -- congressional inquiries; *radioactive waste management -- licensing; *radioactive waste management -- safeguard regulations
Descriptors: data analysis; federal radiation council; storage facilities; US DOE; US NRC
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; regulations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations

Citation 115

<DIALOG File 103: >
02129202 NOV-88-002620; EDB-88-071931
Title: Field testing of waste forms using lysimeters
Author(s): McConnell, J.W. Jr.; Rogers, R.D.; Post, R.G.
Affiliation: Idaho National Engineering Lab., EG and G Idaho, Inc., Idaho Falls, ID 83415 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 551-556

Report Number(s): CONF-870306-
Contract Number (DOE): AC07-76ID01570
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ERA8804
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Low-Level Waste Data Base Development - EPICOR-II Resin/Liner Investigation Program funded by the U.S. Nuclear Regulatory Commission is obtaining information on performance of radioactive waste in a disposal environment. Waste forms manufactured from ion exchange resins used to clean up water from the accident at Three Mile Island Nuclear Power Station are being examined in field tests. This paper presents a description of the field testing and results from the first year of operation.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- data base management; *low-level radioactive wastes -- field tests; *low-level radioactive wastes -- waste processing plants; *lysimeters -- uses; *resins -- performance testing; *resins -- uses; *three mile island-1 reactor -- field tests; *three mile island-2 reactor -- field tests; *waste processing plants -- performance testing; *waste processing plants -- test facilities
Descriptors: data analysis; environmental impacts; ion exchange; liners; reactor accidents; US NRC
Broader Terms: accidents; enriched uranium reactors; industrial plants; management; materials; measuring instruments; national organizations; organic compounds; organic polymers; petrochemicals; petroleum products; polymers; power reactors; pwr type reactors; radioactive materials; radioactive wastes; reactors; testing; thermal reactors; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
400202 -- Isotope Effects, Isotope Exchange, & Isotope Separation
990300 -- Information Handling
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
420204 -- Engineering -- Shipping Containers
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal
B1220 -- Isotope effects, isotope exchange, & isotope separation
F3000 -- Nuclear Documentation
F2200 -- Nuclear Law -- Nuclear Installations
E1520 -- Shipping containers

Citation 116

<DIALOG File 103: >
02129195 NOV-88-002605; EDB-88-071924
Title: Performance evaluation and operational experience with a semi-automatic monitor for the radiological characterization of low-level wastes
Author(s): Davey, E.C.; Csullog, G.W.; Post, R.G.
Affiliation: Atomic Energy of Canada Ltd. Research Co., Chalk River Nuclear Labs., Chalk River, Ontario K0J 1P0 (CA)
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 275-284
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature

Language: English
Journal Announcement: INS8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: Canada
Country of Publication: United States
Abstract: Chalk River Nuclear Laboratories (CRNL) have undertaken a Waste Disposal Project to co-ordinate the transition from the current practice of interim storage to permanent disposal for low-level radioactive wastes (LLW). The strategy of the project is to classify and segregate waste segments according to their hazardous radioactive lifetimes and to emplace them in disposal facilities engineered to isolate and contain them. To support this strategy, a waste characterization program was set up to estimate the volume and radioisotope inventories of the wastes managed by CRNL. A key element of the program is the demonstration of a non-invasive measurement technique for the isotope-specific characterization of solid LLW. This paper describes the approach taken at CRNL for the non-invasive assay of LLW and the field performance and early operational experience with a waste characterization monitor to be used in a waste processing facility.
Major descriptors: *chalk river nuclear labs -- radioactive waste management; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *waste processing plants -- performance testing; *waste processing plants -- planning; *waste processing plants -- test facilities
Descriptors: design; engineering; hazardous materials; isotopes; measuring methods
Broader Terms: atomic energy of canada ltd; canadian organizations; industrial plants; management; materials; national organizations; radioactive materials; radioactive wastes; testing; waste disposal; waste management; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: E5100* -- Waste Treatment
C5400 -- Radiation Protection Procedures

Citation 117

<DIALOG File 103: >
02129194 NOV-88-002202; EDB-88-071923
Author(s): Post, R.G.
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 823
Report Number(s): CONF-870306-
Document Type: Book; Conference literature
Language: English
Journal Announcement: INS8804
Availability: University of Arizona Nuclear Engineering Dept., Tucson, AZ 85721.
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: This book contains 12 sections, each consisting of several papers. The section titles are: Utility Low-Level Waste Management: Plans and Practices; Power-Low-Level Waste Disposal Activities and Waste Management at the IMPC; Siting Developments for LLW Disposal Facilities; Utility LLW Management-Waste Characterization; LLW Containers; Packages and Casks Technologies; Low-Level Waste Processing; LLW Filtration and Ion Exchange Media Processes; Utility-Low Level Waste Management: Processing; Mixed, Hazardous and Short-Lived Wastes; Low Level Waste Regulatory Compliance; LL Waste Processing/Form/Transportation and Associated Equipment/Facilities/Plans; and LL Waste Form Technology.
major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste processing; *low-level radioactive wastes -- waste disposal; *nuclear power plants -- computerized control systems;

*nuclear power plants -- expert systems; *nuclear power plants -- liquid wastes; *nuclear power plants -- solid wastes; *radioactive waste management -- technology assessment; *waste processing plants -- computerized control systems; *waste processing plants -- performance testing; *waste processing plants -- technology assessment; *waste processing plants -- transport regulations
Descriptors: leading abstract; microprocessors; remote handling; resource recovery acts; safeguard regulations; spent fuel storage; waste transportation
Broader Terms: abstracts; computers; control systems; document types; electronic circuits; industrial plants; laws; management; materials; microel ectronic circuits; nuclear facilities; power plants; processing; radioa ctive materials; radioactive wastes; regulations; storage; testing; thermal power plants; transport; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
220400 -- Nuclear Reactor Technology -- Control Systems
990210 -- Supercomputers -- (1987-1989)
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal
F4000 -- Safeguards & Inspection
F2200 -- Nuclear Law -- Nuclear Installations
E2400 -- Reactor Control Systems
F5000 -- Mathematical Methods & Computer Codes

Citation 118

<DIALOG File 103: >
02129192 NOV-88-001625; INS-88-012936; EDB-88-071921
Title: Status of the Oak Ridge National Laboratory new hydrofracture facility: Implications for the disposal of liquid low-level radioactive wastes by underground injection
Author(s): Haase, C.S.; Stow, S.H.; Post, R.G.
Affiliation: Environmental Sciences Div., Oak Ridge National Lab., P.O. Box X, Oak Ridge, TN 37831-6317 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 227-234
Report Number(s): CONF-870306-
Contract Number (DOE): AC05-84OR21400
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ERA8804
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: From 1982 to 1984, Oak Ridge National Laboratory (ORNL) disposed of approximately 2.8 x 10/sup 16/ Bq (7.5 x 10/sup 5/ Ci) of liquid low-level radioactive wastes by underground injection at its new hydrofracture facility. This paper summarizes the regulatory and operational status of that ORNL facility and discusses its future outlook. Operational developments and regulatory changes that have raised major questions about the continued operation and the new hydrofracture facility include: (1) significant /sup 90/Sr contamination of some groundwater in the injection formation; (2) questions about the design of the injection well, completed prior to the application of the underground injection control (UIC) regulations to the ORNL facility; (3) questions about the integrity of the reconfigured injection well put into service following the loss of the initial injection well; and (4) implementation

of UIC regulations. Ultimately, consideration of the regulatory and operational factors led to the decision in early 1986 not to proceed with a UIC permit application for the ORNL facility. There are no plans to reactivate the hydrofracture process. Subsequent to the decision not to proceed with a UIC permit application, closure activities were initiated for the ORNL hydrofracture facility. Closure of the facility will occur under both state of Tennessee and federal UIC regulations and under provision 3004(u) of the Resource Conservation and Recovery Act.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste processing; *low-level radioactive wastes -- safeguard regulations; *low-level radioactive wastes -- underground disposal; *low-level radioactive wastes -- waste disposal; *ORNL -- injection wells; *ORNL -- low-level radioactive wastes; *ORNL -- resource recovery facilities; *ORNL -- waste disposal; *radioactive waste processing -- government policies; *radioactive waste processing -- licensing; *radioactive waste processing -- technology assessment
Descriptors: fluid injection processes; resource conservation; resource recovery acts; tennessee
Broader Terms: energy facilities; federal region iv; industrial plants; laws; management; materials; national organizations; north america; processing; radioactive materials; radioactive wastes; regulations; US AEC; US DOE; US ERDA; USA; waste disposal; waste management; waste processing; waste processing plants; wastes; wells
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E5100* -- Waste Treatment
F2200 -- Nuclear Law -- Nuclear Installations
F4000 -- Safeguards & Inspection

Citation 119

<DIALOG File 103: >
02129189 NOV-88-000327; INS-88-012933; EDB-88-071918
Title: Management of liquid and solid radioactive waste from nuclear power plants in the federal republic of Germany
Author(s): Blinn, K.; Post, R.G.
Affiliation: Kraftwerk Union Aktiengesellschaft, D-6050 Offenbach am Main (DE)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 9-12
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: Germany, Federal Republic of
Country of Publication: United States
Abstract: For treatment of liquid waste, the main process methods used in German nuclear power plants are evaporation and mechanical filtration. An improved method, instead of a mechanical filter, is the use of centrifuges. The centrifuge system offers at least the same decontamination factor but generates 10 times less waste. For treatment of liquid concentrates and solid waste, several methods are available. An improved method for cementation is the use of a continuous mixer instead of an in-drum mixer. This continuous process offers, due to the small dimensions and the good homogeneity of the product, a number of advantages.
Major descriptors: *federal republic of germany -- nuclear industry; *federal republic of germany -- radioactive waste management; *liquid wastes -- centrifugal pumps; *liquid wastes -- radioactive waste management; *nuclear industry -- pollution control equipment; *nuclear industry -- radioactive waste management; *radioactive waste processing -- centrifugal pumps; *radioactive waste processing -- mechanical filters; *radioactive waste processing

-- technology assessment; *radioactive wastes - classification; *radioactive wastes -- decontamination; *solid wastes -- grouting; *solid wastes -- radioactive waste management
Descriptors: cements; cost benefit analysis
Broader Terms: building materials; cleaning; equipment; europe; filters; industry; management; materials; processing; pumps; radioactive materials; waste management; waste processing; wastes; western europe
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
220200 -- Nuclear Reactor Technology -- Components & Accessories
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal
E2200 -- Reactor Components & Accessories
F4200 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 120

<DIALOG File 103: >
02129182 NOV-88-000314; ERA-13-024191; INS-88-012926; EDB-88-071911
Title: Evaluation of potential mixed wastes containing lead, chromium, or used oil
Author(s): Siskind, B.; MacKenzie, D.R.; Bowerman, B.S.; Kempf, C.R.; Piciulo, P.L.; Post, R.G.
Affiliation: Dept. of Nuclear Energy, Brookhaven National Lab., Upton, NY 11973 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 375-384
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: This paper presents the results of follow-on studies conducted by Brookhaven National Laboratory (BNL) for the Nuclear Regulatory Commission (NRC) on certain kinds of low-level waste (LLW) which could also be classified as hazardous waste subject to regulation by the Environmental Protection Agency (EPA). Such LLW is termed ''mixed waste.'' Additional data have been collected and evaluated on two categories of potential mixed waste, namely LLW containing metallic lead and LLW containing chromium. Additionally, LLW with organic liquids, especially liquid scintillation wastes, are reviewed. In light of a proposed EPA rule to list used oil as hazardous waste, the potential mixed waste hazard of used oil contaminated with radionuclides is discussed. It is concluded that the EPA test for determining whether a solid waste exhibits the hazardous characteristic of extraction procedure toxicity does not adequately simulate the burial environment at LLW disposal sites, and in particular, does not adequately assess the potential for dissolution and transport of buried metallic lead. Also, although chromates are, in general, not a normal or routine constituent in commercial LLW (with the possible exception of chemical decontamination wastes), light water reactors which do use chromates might find it beneficial to consider alternative corrosion inhibitors. In addition, it is noted that if used oil is listed by the EPA as hazardous waste, LLW oil may be managed by a scheme including one or more of the following processes: incineration, immobilization, sorption, aqueous extraction and glass furnace processing.
Major descriptors: *chemical wastes -- classification; *chemical wastes -- evaluation; *chromium -- quantity ratio; *lead -- quantity ratio; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- decontamination; *low-level radioactive wastes -- evaluation; *low-level radioactive wastes -- quantitative chemical analysis; *radio active waste disposal -- environmental impacts; *radioactive waste disposal -- technology

assessment
Descriptors: chemisorption; ground disposal; hazardous materials; health hazards; incinerators; oils; radionuclide migration; separation processes; soils; solvent extraction; stabilization; toxicity; US NRC
Broader Terms: chemical analysis; chemical reactions; cleaning; elements; environmental transport; extraction; hazards; management; mass transfer; materials; metals; national organizations; organic compounds; other organic compounds; radioactive materials; radioactive wastes; separation processes; sorption; transition elements; waste disposal; waste management; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
054000 -- Nuclear Fuels -- Health & Safety
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment
C5400 -- Radiation Protection Procedures
E5200 -- Waste Disposal

Citation 121

<DIALOG File 103: >
02129161 NOV-88-000277; INS-88-012907; EDB-88-071890
Title: Issues and viewpoints concerning the application of RCRA to radioactive mixed waste management facilities
Author(s): Fredrickson, C.L.; Hansen, R.P.; Hart, J.S.; Post, R.G.
Affiliation: International Technology (IT) Corp., Albuquerque, NM 87106 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 711-716
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EPA8804
Subfile: EPA (Energy Abstracts for Policy Analysis); INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: This paper traces the origin and evolution of the controversy over whether the Resource Conservation and Recovery Act (RCRA) and its attendant federal and state regulations apply to defense installations authorized under the Atomic Energy Act (AEA), particularly those managed by the U.S. Department of Energy (DOE). The focus of the inquiry is on the application of RCRA to mixtures of high-level, transuranic (TRU), and low-level radioactive waste containing source, special nuclear, or byproduct material as defined by the AEA and hazardous chemical waste as identified under RCRA Subtitle C (i.e., mixed waste). The paper examines the mixed waste issue from an historical perspective, reviews the RCRA exclusions for nuclear material, compares AEA and the proposed DOE definition of ''byproduct material,'' and analyzes various agency viewpoints on the regulation of mixed waste.
Major descriptors: *high-level radioactive wastes -- classification; *high- level radioactive wastes -- health hazards; *high-level radioactive wastes -- radioactive waste disposal; *high-level radioactive wastes -- safeguard regulations; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- health hazards; *low-level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- safeguard regulations; *radioactive waste disposal -- government policies
Descriptors: atomic energy act; chemical wastes; hazardous materials; historical aspects; materials recovery; mixtures; radioactive waste management; resource conservation; US DOE
Broader terms: atomic energy laws; dispersions; hazards; laws; management; materials; national organizations; processing; radioactive materials; radioactive wastes; recovery; regulations; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management

056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
054000 -- Nuclear Fuels -- Health & Safety
290400 -- Energy Planning & Policy -- Energy Resources
INIS Subject Categories: E5000* -- Waste Management
F2200 -- Nuclear Law -- Nuclear Installations
F4100 -- Safeguards & Inspection -- Technical Aspects
C5400 -- Radiation Protection Procedures

Citation 122

<DIALOG File 103: >
02129160 NOV-88-000266; INS-88-012906; EDB-88-071889
Title: Limerick Generating Station compliance with regulatory requirements governing the classification of low-level radioactive waste
Author(s): Trinoskey, P.A.; Murphy, G.W.; Wells, L.A.; Post, R.G.
Affiliation: Kaiser Engineers Inc., Oakland, CA 94623 (USA)
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 267-270
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The purpose of this paper is to summarize the program which Limerick Generating Station (LGS) uses to comply with regulatory requirements for the proper classification of low-level radioactive waste. LGS chose the AIF/NESP study on classification of low-level radioactive wastes as the baseline from which the waste classification program was developed prior to plant specific off-site analysis. Following 100 full power days of operation, a plant, specific data base was established. A computer assisted surveillance program has been implemented to ensure that radionuclide distributions are within the guidelines of the May 11, 1983, NRC Division of Waste Management technical position (TP) paper on waste classification.
Major descriptors: *low-level radioactive wastes -- classification; *nuclear power plants -- computerized control systems; *nuclear power plants - - data base management; *nuclear power plants -- low-level radioactive wastes
Descriptors: limerick-1 reactor; limerick-2 reactor; radionuclide migration; regulations; US NRC
Broader Terms: BWR type reactors; control systems; environmental transport; management; mass transfer; materials; national organizations; nuclear facilities; power plants; power reactors; radioactive materials; radioactive wastes; reactors; thermal power plants; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
220400 -- Nuclear Reactor Technology -- Control Systems
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5000* -- Waste Management
E3100 -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types)
E2400 -- Reactor Control Systems
F2200 -- Nuclear Law -- Nuclear Installations

Citation 123

<DIALOG File 103: >
02122681 NOV-88-099681; INS-88-011100; EDB-88-065408
Title: Alternative enhanced low-level radioactive waste burial
Author(s): Lawroski, H.; Post, R.G.
Affiliation: H. Lawroski and Associates, P.A., Idaho Falls, ID 83401
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 201-204
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The author presents background information on low-level radioactive waste disposal. An alternative enhanced low-level radioactive waste burial concept utilizing engineered concrete entombment is presented. Costs of the concrete entombment are estimated as well as costs of the presently NRC required waste form testing and process control programs. The yearly costs for the alternative enhanced low-level radioactive waste burial concept are $500,000 for all United States Class B and C wastes. The present yearly costs for waste form testing, process control programs and other expenses are estimated to be at least $6,000,000. The relative long-term characteristics indicate that the engineered concrete entombment is superior to the dependence on individual waste package buried at the disposal site.
major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- ground disposal; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste disposal -- cost; *radioactive waste disposal -- technology assessment; *radioactive waste processing -- control systems; *radioactive waste processing -- test facilities; *reinforced concrete -- uses
Descriptors: evaluation; US NRC; USA
Broader Terms: building materials; concretes; management; materials; national organizations; north america; processing; radioactive materials; rad ioactive wastes; reinforced materials; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
360603 -- Materials -- Properties
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations
B2440 -- Other Materials -- Physical properties including mechanical properties

Citation 124

<DIALOG File 103: >
02122675 NOV-88-099672; INS-88-011094; EDB-88-065402
Title: Waste-acceptance criteria for radioactive waste disposal
Author(s): Gilbert, T.L.; Meshkov, N.K.; Post, R.G.
Affiliation: Energy and Environmental Systems Div., Argonne National Lab., Argonne, IL 60439
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87

Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 297-304
Report Number(s): CONF-870306-
Contract Number (DOE): W-31-109-ENG-38
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ERA8804
Subfile: ERA (Energy Research Abstracts); EPA (Energy Abstracts for Policy Analysis); INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: A method has been developed for establishing waste-acceptance criteria based on quantitative performance factors that characterize the confinement capabilities of a disposal facility for radioactive waste. The method starts from the basic objective of protecting public health and safety by assuring that disposal of the waste will not result in a radiation dose to any member of the general public, in either the short or long term, in excess of an established basic dose limit. A key aspect of the method is the introduction of a confinement factor that characterizes the overall confinement capability of a particular disposal facility and can be used for quantitative performance assessments as well as for establishing facility-specific waste-acceptance criteria. Confinement factors enable direct and simple conversion of a basic dose limit into waste-acceptance criteria, specified as concentration limits on radionuclides in the waste streams. Waste-acceptance criteria can be represented visually as activity/time plots for various waste streams. These plots show the concentrations of radionuclides in a waste stream as a function of time and permit a visual, quantitative assessment of long-term performance, relative risks from different radionuclides in the waste stream, and contributions from ingrowth. Application of the method to generic facility designs provides a rational basis for a waste classification system.
Major descriptors: *liquid wastes -- radioactive wastes; *public health -- radiation protection; *radioactive waste disposal -- safeguard regulations; *radioactive waste disposal -- technology assessment; *rad ioactive waste facilities -- design; *radioactive waste facilities -- performance testing; *radioactive wastes -- classification
Descriptors: dose rates; evaluation; quantity ratio; radiation doses; radionuclide migration; risk assessment; time dependence
Broader Terms: doses; environmental transport; management; mass transfer; materials; nuclear facilities; radioactive materials; regulations; testing; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
054000 -- Nuclear Fuels -- Health & Safety
290300 -- Energy Planning & Policy -- Environment, Health, & Safety
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
C5400 -- Radiation Protection Procedures
F4100 -- Safeguards & Inspection -- Technical Aspects

Citation 125

<DIALOG File 103: >
02122620 NOV-88-099691; INS-88-011050; EDB-88-065347
Title: Impacts of short-lived radionuclides on 10CFR61 classification and dose-to-curie methodologies
Author(s): Hillmer, T.P.; Hensch, J.R.; Miller, A.D.; James, D.B.; Post, R.G.
Affiliation: Arizona Nuclear Power Project, Phoenix, AZ 85072
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 3 - Low-level waste
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ

Publication Date: 1987 p 259-262
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8804
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Procedures for dose-to-curie calculation and 10CFR61 classification must account for radwaste containing significant quantities of radionuclides with half-lives of weeks to months. The contributions from shorter-lived nuclides may be significant in waste from plants early in operational history. At the Palo Verde Nuclear Generating Station, the reactor coolant pumps contain antimony, and 60-day Sb-124 is the major nuclide in the radwaste. Computer calculations are presented that show how containers with a one-R/h dose rate but containing waste of different ages and with Co-60 and Sb-124 in varying ratios have very different total curie contents and compositions. Three approaches are described for accurately determining the curie compositions and 10CFR classification of such waste.
Major descriptors: *antimony 124 -- quantity ratio; *cobalt 60 -- quantity ratio; *radioactive wastes -- chemical composition; *radioactive wastes -- classification; *radioactive wastes -- computer calculations; *radioisotopes -- half-life
Descriptors: containers; coolant loops; dose rates; environmental impacts; fuel-coolant interactions; radioactive waste processing
Broader Terms: antimony isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; cobalt isotopes; cooling systems; days living radioisotopes; energy systems; intermediate mass nuclei; internal conversion radioisotopes; isomeric transition isotopes; isotopes; management; materials; minutes living radioisotopes; nuclei; odd-odd nuclei; processing; radioactive materials; radioisotopes; waste management; waste processing; wastes; years living radioisotopes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5100* -- Waste Treatment

Citation 126

<DIALOG File 103: >
02122595 GBN-88-000195; EDB-88-065322
Title: Radioactive waste management practices in other countries
Author(s): Flowers, R.H.
Affiliation: UKAEA Authority Fuel Processing Directorate, Harwell
Title: Management and disposal of intermediate and low level radioactive waste. Papers presented at a seminar held at the Institution of Mechanical Engineers, London, UK, on 19 March 1987 (Solid radioactive wastes)
Corporate Source: Institution of Mechanical Engineers, London (UK)
Conference Title: Seminar on the management and disposal of intermediate and low level radioactive waste
Conference Location: London, UK Conference Date: 19 Mar 1987
Publisher: Mechanical Engineering Publications Ltd. ,London, England
Publication Date: 1987 p 39-44
Report Number(s): CONF-8703243-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8803
Subfile: GBN (United Kingdom (sent to DOE from))
Country of Origin: United Kingdom
Country of Publication: United Kingdom
Abstract: The basis of classification of solid radioactive wastes is described, with reference to definitions used in France, UK and USA. By surveying the plans and the facilities for managing each type of waste in a number of countries, the general trends in technical approach are identified.

Major descriptors: *radioactive waste disposal -- radioactive waste facilities; *solid wastes -- classification
Descriptors: canada; containment; federal republic of germany; france; high-level radioactive wastes; intermediate-level radioactive wastes; japan ; low-level radioactive wastes; site selection; spent fuels; sweden; underground disposal; united kingdom; USA
Broader Terms: asia; energy sources; europe; fuels; management; materials; north america; nuclear facilities; nuclear fuels; radioactive materials; radioactive wastes; reactor materials; scandinavia; waste disposal; waste management; wastes; western europe
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 127

<DIALOG File 103: >
02122593 DEN-88-003261; EDB-88-065320
Author(s): Merz, E.; Nowak, R.
Title: Radioactive waste management. Waste forms of high-level radioactive wastes from reprocessing
Original Title: Entsorgung radioaktiver Abfaelle. Verwahrform hochaktiver Abfaelle aus der Wiederaufarbeitung
Corporate Source: Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.) Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.)
Publication Date: Oct 1987 p 111
Report Number(s): GRS-66
Order Number: TI88752646
Document Type: Report
Language: German
Journal Announcement: ERA8804
Availability: NTIS (US Sales Only), PC A06/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS). DEN (Federal Republic of Germany (sent to DOE from))
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: First, some general informations are given about radioactive waste, e.g. arising of waste, classification, intermediate deposition and transport, as well as about the multi-barrier concept. Then, emphasis is laid on the internationally favoured vitrification of high-active waste. Safety requirements and the physical-chemical characteristics of the waste forms are described as are the different technical vitrification processes. Moreover, alternative solidification products such as ceramic materials and synthetic rocks were discussed. In addition, the worldwide technical concepts for the management and final disposal of radioactive waste are summarized.
Major descriptors: *high-level radioactive wastes -- waste forms
Descriptors: containers; fuel reprocessing plants; radioactive waste disposal; radioactive waste management; radioactive waste processing; radioactive waste storage; reprocessing; reviews; vitrification
Broader Terms: document types; management; materials; nuclear facilities; processing; radioactive materials; radioactive wastes; separation processes; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
050800 -- Nuclear Fuels -- Spent Fuels Reprocessing

Citation 128

<DIALOG File 103: >
02113013 INS-88-009649; EDB-88-055739
Title: Application for alternative disposal of very low level radioactive waste
Author(s): Lan, C.; Schulte, J.H.
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: Dallas, TX, USA Conference Date: 7 Jun 1987
Source: Trans. Am. Nucl. Soc. (United States) v 54. Coden: TANSA

Publication Date: 1987 p 99
Report Number(s): CONF-870601-Summs.
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8803
Subfile: INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Abstract: This paper describes the experiences of obtaining NRC and state (North Carolina and South Carolina) approval for disposing of very low level radioactive wastes at Duke Power Company's nuclear stations. The approved disposal procedures include land farming of water treatment residues, on-site disposal (burial) of decontamination sand and contaminated feedwater heaters, and off-site release of sanitary sludge for treatment work and disposal. Present proposed applications include on-site disposal (burial) of replaced moisture separator reheater tube bundles and spent-fuel pool racks. The guidance and criteria for preparing a request for approval of alternative disposal under 10CFR20.302 are also discussed. Users of radioactive materials should not exclude the de minimis approach in their quest to reduce the volume of radioactive waste. It is expected that such submittals could provide a data base for further development of generic limits for all radioactive wastes.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: carbon 14; decision making; decontamination; nuclear power plants; regulations; tritium; US NRC; volume
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cleaning; even-even nuclei; hydrogen isotopes; isotopes; light nuclei; management; materials; national organizations; nuclear facilities; nuclei; odd-even nuclei; power plants; radioactive materials; radioactive wastes; radioisotopes; thermal power plants; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 129

<DIALOG File 103: >
02093903 NOV-88-092216; EDB-88-036626
Title: Impacts and ramifications of defining high-level waste
Author(s): Wood, D.E.; Campbell, M.H.; Shupe, M.W.; Post, R.G.
Affiliation: Rockwell Hanford Operations, Richland, WA 99352
Title: Waste management '87: Waste isolation in the US, technical programs, and public education
Series/Collection Title: Volume 1 - General interest
Conference Title: Waste management '87
Conference Location: Tucson, AZ, USA Conference Date: 1 Mar 1987
Publisher: University of Arizona Nuclear Engineering Dept.,Tucson, AZ
Publication Date: 1987 p 319-322
Report Number(s): CONF-870306-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8802
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission (NRC) is considering rulemaking to provide a concentration-based definition of high-level waste (HLW) under authority derived from the Nuclear Waste Policy Act (NWPA) of 1982 and the Low Level Waste Policy Amendments Act of 1985. The Department of Energy (DOE), which has the responsibility to dispose of certain kinds of commercial waste, is supporting development of a risk-base classification system by the Oak Ridge National Laboratory (ORNL), to assist in developing and implementing the NRC rule. The system is two-dimensional, with the axes based on the phrases ''highly radioactive'' and ''requires permanent

isolation'' in the definition of HLW in the NWPA. Defining HLW reduces the ambiguity in the present isolation'' in the present source-based definition by providing concentration limits to establish which materials are to be called HLW. Several possible classification systems have been derived and the characteristics of each are discussed.
Major descriptors: *high-level radioactive wastes -- classification
Descriptors: ORNL; radioactive waste disposal; radioactive waste facilities; recommendations; regulations; reviews; safety standards; US DOE; US NRC; waste disposal acts
Broader Terms: document types; laws; management; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; standards; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations

Citation 130

<DIALOG File 103: >
02082796 EDB-88-025518
Title: The 1986 state-by-state assessment of low-level radioactive wastes received at commercial disposal sites
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Publication Date: Dec 1987 p 38
Report Number(s): DOE/LLW-66T
Order Number: DE88004368
Contract Number (DOE): AC07-76ID01570
Note: Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted
Document Type: Report
Language: English
Journal Announcement: ERA8802
Availability: NTIS, PC A03/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input); EPA (Energy Abstracts for Policy Analysis). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: The data are grouped and presented by compact regions. The data include activity and volume by waste classes, generator type, and disposal site. The report uses the volume of low-level waste reported as received at each commercial disposal site as the national baseline figure. A volume of 1,804,998 cubic feet (51,113 cubic meters) of radioactive waste containing 233,726 curies of activity was reported disposed at the commercial sites in 1986. The total volume and curie values tabulated for each state were obtained directly from the commercial disposal site operators. The total is the sum of the volume and radioactivity reported by Chem Nuclear Systems, Inc., and US Ecology for each state. Sixty-three percent of low-level waste volumes disposed at commercial sites was assigned to the state of origin. These volumes represent those disposed at Beatty and Barnwell disposal sites. Thirty-seven percent, or 665,066 cubic feet (18,831 cubic meters), of the waste disposed in the US in 1986 went to the Richland site. 8 refs., 75 figs., 4 tabs.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- ground disposal; *radioactive waste disposal -- inventories
Descriptors: commercial sector; compact commissions; compliance; data compilation; nuclear waste policy acts; radioactive waste management; site characterization; state government
Broader Terms: data; information; laws; management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
510300 -- Environment, Terrestrial -- Radioactive Materials Monitoring & Transport -- (-1989)
290600 -- Energy Planning & Policy -- Nuclear Energy
290300 -- Energy Planning & Policy -- Environment, Health, & Safety

293000 -- Energy Planning & Policy -- Policy, Legislation, & Regulation
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations
B3110 -- Radioactive materials monitoring & transport
F1400 -- Social Impact of Nuclear Science & Technology

Citation 131

<DIALOG File 103: >
02065310 GBN-86-002316; EDB-88-008030
Title: Environment Committee report
Author(s): Greenhalgh, G.
Source: Atom (London) (United Kingdom) v 355. Coden: ATMMA
Publication Date: May 1986 p 18-19, 21-22
Document Type: Journal Article
Language: English
Journal Announcement: EDB8712
Subfile: GBN (United Kingdom (sent to DOE from))
Country of Origin: United Kingdom
Abstract: The findings of the House of Commons Environment Committee (March 1986) on radioactive waste are examined. The report includes 43 recommendations and conclusions, many of which are directed at improving public acceptance of nuclear power, rather than constituting an attack on the nuclear industry. Some of the major topics considered in the report include: waste disposal, waste classification, waste disposal policy, discharges, reprocessing, and public acceptance.
Major descriptors: *radioactive waste disposal -- government policies; *radioactive waste disposal -- public opinion
Descriptors: nuclear power; public relations; reprocessing; united kingdom; waste management
Broader Terms: europe; management; power; separation processes; waste disposal; waste management; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 132

<DIALOG File 103: >
02049138 ERA-13-003041; EDB-87-177097
Title: Defining mixed low-level radioactive and hazardous waste
Author(s): Weber, M.F.
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Proceedings of the eight annual DOE low-level waste management forum: Technical Session 7, Waste characterization and regulation
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 8. annual participants' information meeting of the DOE Low-Level Waste Management Program
Conference Location: Denver, CO, USA Conference Date: 22 Sep 1986
Publication Date: Feb 1987 p 93-100
Report Number(s): CONF-860990-Pt.7
Order Number: DE87012448
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8712
Availability: NTIS, PC A06/MF A01; 1.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). JMT(DOE contractor)

Country of Origin: United States
Country of Publication: United States
Abstract: During the last several months, staffs of the US Nuclear Regulatory Commission (NRC) and the US Environmental Protection Agency (EPA) have been developing a working definition of Mixed Low-Level Radioactive and Hazardous Waste (Mixed LLW). Such wastes are currently being regulated by NRC under authority of the Atomic Energy Act (AEA), as amended, and by EPA under the Resource Conservation and Recovery Act (RCRA), as amended. Development of the definition is one component of a comprehensive program to resolve differences between the regulatory programs of the two agencies pertaining to the regulation of the management and disposal of Mixed LLW. Although the definition is still undergoing legal and policy reviews in both agencies, this paper presents the current working definition, discusses a methodology that may be used by NRC licensees to identify Mixed LLW, and provides responses to anticipated questions from licensees about the definition. 3 references, 1 figure.
Major descriptors: *hazardous materials -- classification; *low-level radioactive wastes -- classification
Descriptors: contamination regulations; mixtures; pollution regulations; radioactive waste disposal; radioactive waste management; regulatory guides; testing; US EPA; US NRC
Broader Terms: dispersions; document types; management; materials; national organizations; pollution regulations; radioactive materials; radioactive wastes; regulations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5200* -- Waste Disposal
F2200 -- Nuclear Law -- Nuclear Installations

Citation 133

<DIALOG File 103: >
02049064 ERA-13-003026; EDB-87-177023
Title: EPRI waste processing projects
Author(s): Shaw, R.A.
Affiliation: Electric Power Research Institute, Palo Alto, CA
Title: Proceedings of the eight annual DOE low-level waste management forum: Technical Session 6, Waste treatment
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 8. annual participants' information meeting of the DOE Low-Level Waste Management Program
Conference Location: Denver, CO, USA Conference Date: 22 Sep 1986
Publication Date: Feb 1987 p 17-26
Report Number(s): CONF-860990-Pt.6
Order Number: DE87012447
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8712
Availability: NTIS, PC A05/MF A01; 1.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). JMT(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Electric Power Research Institute (EPRI) manages research for its sponsoring electric utilities in the United States. Research in the area of low level radioactive waste (LLRW) from light water reactors focuses primarily on waste processing within the nuclear power plants, monitoring of the waste packages, and assessments of disposal technologies. Accompanying these areas and complimentary to them is the determination and evaluation of the sources of nuclear power plants radioactive waste. This paper focuses on source characterization of nuclear power plant waste, LLRW processing within nuclear power plants, and the monitoring of these wastes. EPRI's work in waste disposal technology is described in another paper in this proceeding by the same author. 1 reference, 5 figures.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste

processing; *waste forms --monitoring
Descriptors: EPRI; liquid wastes; nuclear power plants; performance; research programs; solid wastes; surveys
Broader Terms: management; materials; nuclear facilities; power plants; processing; radioactive materials; radioactive wastes; thermal power plants; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5100* -- Waste Treatment

Citation 134

<DIALOG File 103: >
02049045 EDB-87-177004
Title: Summary of session on waste characterization and regulation
Author(s): Dressen, A.L.
Affiliation: Envirosphere Co.
Title: Proceedings of the eight annual DOE low-level waste management forum: Executive summary, opening plenary session, closing plenary session, attendees
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 8. annual participants' information meeting of the DOE Low-Level Waste Management Program
Conference Location: Denver, CO, USA Conference Date: 22 Sep 1986
Publication Date: Feb 1987 p 71-73
Report Number(s): CONF-860990-Summ.
Order Number: DE87012441
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8712
Availability: NTIS, PC A06/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Four wastes were discussed: below regulatory concern, BRC, wastes; mixed wastes, i.e., low-level radioactive wastes and hazardous chemicals; naturally-occurring and accelerator-produced radioactive material, NARM; and carbon 14. A characterization and the regulatory issues involved with each waste are briefly summarized.
Major descriptors: *carbon 14 -- contamination regulations; *hazardous materials -- classification; *hazardous materials -- contamination regulations; *low-level radioactive wastes -- classification; *low-leve l radioactive wastes -- contamination regulations; *natural radioactivity -- classification; *natural radioactivity -- contamination regulations
Descriptors: radioactive waste disposal; radioactive waste management
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; even-even nuclei; isotopes; light nuclei; management; materials; nuclei; pollution regulations; radioactive materials; radioactive wastes; radioactivity; radioisotopes; regulations; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5000* -- Waste Management
F2200 -- Nuclear Law -- Nuclear Installations

Citation 135

<DIALOG File 103: >
02049036 ERA-13-003019; EDB-87-176995
Title: Ramifications of defining high-level waste
Author(s): Wood, D.E.; Campbell, M.H.; Shupe, M.W.
Affiliation: Rockwell Hanford Operations, Richland, WA

Title: Proceedings of the eighth annual DOE low-level waste management forum: Technical Session 5, Performance assessment
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 8. annual participants' information meeting of the DOE Low-Level Waste Management Program
Conference Location: Denver, CO, USA Conference Date: 22 Sep 1986
Publication Date: Feb 1987 p 10-17
Report Number(s): CONF-860990-Pt.5
Order Number: DE87012446
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8712
Availability: NTIS, PC A06/MF A01; 1.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). JMT(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission (NRC) is considering rule making to provide a concentration-based definition of high-level waste (HLW) under authority derived from the Nuclear Waste Policy Act (NWPA) of 1982 and the Low Level Waste Policy Amendments Act of 1985. The Department of Energy (DOE), which has the responsibility to dispose of certain kinds of commercial waste, is supporting development of a risk-based classification system by the Oak Ridge National Laboratory to assist in developing and implementing the NRC rule. The system is two dimensional, with the axes based on the phrases highly radioactive and requires permanent isolation in the definition of HLW in the NWPA. Defining HLW will reduce the ambiguity in the present source-based definition by providing concentration limits to establish which materials are to be called HLW. The system allows the possibility of greater-confinement disposal for some wastes which do not require the degree of isolation provided by a repository. The definition of HLW will provide a firm basis for waste processing options which involve partitioning of waste into a high-activity stream for repository disposal, and a low-activity stream for disposal elsewhere. Several possible classification systems have been derived and the characteristics of each are discussed. The Defense High Level Waste Technology Lead Office at DOE - Richland Operations Office, supported by Rockwell Hanford Operations, has coordinated reviews of the ORNL work by a technical peer review group and other DOE offices. The reviews produced several recommendations and identified several issues to be addressed in the NRC rule making. 10 references, 3 figures.
Major descriptors: *high-level radioactive wastes -- classification
Descriptors: low-level radioactive wastes; radioactive waste disposal; radioactive waste management; radioactivity; recommendations; regulatory guides; US DOE; US NRC
Broader Terms: document types; management; materials; national organizations; radioactive materials; radioactive wastes; US organizations; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 136

<DIALOG File 103: >
02027027 EDB-87-154982
Title: Problems of the application of IAEA safeguards to radioactive wastes at nuclear fuel cycle facilities
Author(s): Tsyplenkov, V.S.; Pushkarev, V.I.; Ermakov, S.V.
Affiliation: Tsentral'nyj Nauchno-Issledovatel'skij Institute Informatsii Tekhniko-Ehkonomicheskikh Issledovanijpo Atomnoj Nauke i Tekhnike, Moscow, USSR
Title: Nuclear safeguards technology 1986. Proceedings of an international symposium on nuclear material safeguards held in Vienna, 10-14 November 1986
Conference Title: International symposium on nuclear material safeguards
Conference Location: Vienna, Austria Conference Date: 10 Nov 1986
Publisher: IAEA, Vienna, Austria
Publication Date: 1987 p vp

Report Number(s): CONF-861104-
Document Type: Analytic of a Book; Conference literature
Language: Russian
Journal Announcement: EDB8710
Subfile: INIS (non-US Atomindex input AIX)
Country of Origin: USSR
Country of Publication: International Atomic Energy Agency <IAEA>
Abstract: The significance of waste flow analysis by facility operators, and of verification of their data by IAEA inspectors, increases in step with growing demands for accuracy in nuclear material accounting, improvements in measurement techniques and the development of more efficient methods of extracting nuclear materials from wastes. Radioactive wastes from nuclear fuel cycle facilities could be used both to conceal diversion of nuclear material from the principal flows and to effect diversion by direct removal of nuclear material from the waste. The basis for the possibility of diversion using waste flows is the high degree of dilution of the nuclear materials in the waste matrices, as a result of which IAEA safeguards on some types of waste may be terminated after measurement. A number of problems arise at the waste classification stage; these are identified in the paper, and a range of measures is suggested with a view to improving the application of safeguards procedures to nuclear material in wastes. A proposal is made to establish numerical threshold values for nuclear material concentrations in wastes beyond which they would be classified as measured unrecoverable losses. These values should be a function of the type of nuclear material in the wastes, their physical form and degree of radioactivity, and the method of solidification used. Ways of standardizing the waste measuring equipment available to the facility operator are discussed, as is the need to use the IAEA's technical resources for independent analysis. Values are proposed for the accuracy of measurement of nuclear materials in wastes which would satisfy the accountancy goals at facilities where the materials are in bulk form. 7 references, 1 table.
Major descriptors: *nuclear facilities -- IAEA safeguards
Descriptors: accounting; accuracy; fuel cycle; inspection; nuclear fuels; nuclear materials diversion; quantity ratio; radioactive wastes; solidification; standardization; uses; validation
Broader Terms: energy sources; fuels; materials; phase transformations; radioactive materials; reactor materials; safeguards; testing; wastes
Subject Categories: 055001* -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
052002 -- Nuclear Fuels -- Waste Disposal & Storage

Citation 137

<DIALOG File 103: >
02018954 NOV-87-073522; EDB-87-146908
Title: Operation of a low-level waste disposal facility and how to prevent problems in future facilities
Author(s): Di Sibio, R.; Majumdar, S.K.; Miller, E.W.
Affiliation: Hittman Nuclear and Development Corp., 9151 Rumsey Road, Columbia, MD 21045
Title: Management of radioactive materials and wastes: Issues and progress
Publisher: The Pennsylvania Academy of Science Publications,Easton, PA
Publication Date: 1985 p 137-141
Document Type: Analytic of a Book
Language: English
Journal Announcement: INS8710
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Operation of a low-level waste facility is an ever increasing problem nationally, and specifically one that could grow to crisis proportion in Pennsylvania. There have been, nevertheless, a variety of changes over the years in the management of low level radioactive waste, particularly with regard to disposal facilities that can avert a crisis condition. A number of companies have been organized thru possible a broad range of services to the nuclear industry, including those that emphasize solidification of waste materials, engineering services, waste management,

and transportation to disposal sites across the United States. This paper addresses one particular site and the problems which evolved at that site from an environmental perspective. It is important that it is clearly understood that, although these problems are resolvable, the lessons learned here are critical for the prevention of problems at future facilities. The focus of this paper is on the Maxey Flats, Kentucky disposal facility which was closed in 1977. It must be understood that the regulations for siting, management, burial techniques, waste classification, and the overall management of disposal sites were limited when this facility was in operation.
Major descriptors: *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste facilities -- environmental impacts; *radi oactive waste facilities -- pollution regulations; *radioactive waste facilities -- site selection
Descriptors: classification; forecasting; operation; pennsylvania; political aspects; reviews; safety standards; waste forms
Broader Terms: document types; federal region iii; institutional factors; management; materials; north america; nuclear facilities; radioactive materials; radioactive wastes; regulations; standards; USA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
053000 -- Nuclear Fuels -- Environmental Aspects
056000 -- Nuclear Fuels -- Legislation & Regulations -- (1987-)
INIS Subject Categories: E5200* -- Waste Disposal
C5220 -- Environmental aspects of radioactive effluent from existing nuclear installations
F2200 -- Nuclear Law -- Nuclear Installations

Citation 138

<DIALOG File 103: >
02018888 INS-87-031724; ERA-12-045108; EDB-87-146842
Title: Waste characterization
Author(s): Luksic, A.
Affiliation: Pacific Northwest Lab., Richland, WA
Title: Spent fuel storage technical exchange (Non-fuel bearing)
Corporate Source: Pacific Northwest Lab., Richland, WA (USA) Electric Power Research Inst., Palo Alto, CA (USA)
Conference Title: Spent fuel storage technical exchange meeting
Conference Location: Washington, DC, USA Conference Date: 12 May 1987
Publication Date: 1987 p 286-294
Report Number(s): PNL-SA-15094; CONF-8705162-Vugraphs
Order Number: DE87012683
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8710
Availability: NTIS, PC A14/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: None
Major descriptors: *high-level radioactive wastes -- classification; *high- level radioactive wastes -- materials; *high-level radioactive wastes -- volume; *radioactive waste management
Descriptors: decommissioning; radioactive waste storage; radioisotopes
Broader Terms: isotopes; management; materials; radioactive materials; radioactive wastes; storage; waste management; waste storage; wastes
Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E1510* -- Transport & storage
E5000 -- Waste Management

Citation 139

<DIALOG File 103: >
02010182 ERA-12-043057; EDB-87-138135
Author(s): Wierzbicki, K.S.
Title: Savannah River Certification Plan for newly generated, contact-handled transuranic waste (Contains glossary)
Corporate Source: Savannah River Lab., Aiken, SC (USA)
Publication Date: 1 Dec 1986 p 74
Report Number(s): DPSP-84-17-1-Rev.4
Order Number: DE87013048
Contract Number (DOE): AC09-76SR00001
Note: Portions of this document are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: NTS8709
Availability: NTIS, PC A04/MF A01; 1.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: This Certification Plan document describes the necessary processes and methods for certifying unclassified, newly generated, contact-handled solid transuranic (TRU) waste at the Savannah River Plant and Laboratory (SRP, SRL) to comply with the Waste Isolation Pilot Plant Waste Acceptance Criteria (WIPP-WAC). Section 2 contains the organizational structure as related to waste certification including a summary of functional responsibilities, levels of authority, and lines of communication of the various organizations involved in certification activities. Section 3 describes general plant operations and TRU waste generation. Included is a description of the TRU Waste classification system. Section 4 contains the SR site TRU Waste Quality Assurance Program Plan. Section 5 describes waste container procurement, inspection, and certification prior to being loaded with TRU waste. Certification of waste packages, after package closure in the waste generating areas, is described in Section 6. The packaging and certification of individual waste forms is described in Attachments 1-5. Included in each attachment is a description of controls used to ensure that waste packages meet all applicable waste form compliance requirements for shipment to the WIPP. 3 figs., 3 tabs.
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- radioactive waste disposal
Descriptors: certification; contact handling; savannah river plant; solid wastes; WIPP
Broader Terms: functional models; management; materials; national organizations; nuclear facilities; pilot plants; radioactive materials; radioactive waste facilities; radioactive wastes; underground facilities; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
510500 -- Environment, Terrestrial -- Site Resource & Use Studies -- (-1989)
INIS Subject Categories: E5200* -- Waste Disposal
C5210 -- Environmental aspects of siting of nuclear installations

Citation 140

<DIALOG File 103: >
01979957 ERA-12-034643; EDB-87-107627
Author(s): McVay, C.W.
Title: West Valley Demonstration Project low-level and transuranic waste assay and methodology
Corporate Source: West Valley Nuclear Services Co., Inc., West Valley, NY (USA)
Publication Date: Mar 1987 p 56
Report Number(s): DOE/NE/44139-16
Order Number: DE87011873

Contract Number (DOE): AC07-81NE44139
Note: Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted
Document Type: Report
Language: English
Journal Announcement: NTS8707
Availability: NTIS, PC A04/MF A01; 1.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: In the decontamination and decommissioning of the West Valley Nuclear Facility, waste materials are being removed and packaged in a variety of waste containers which require classification in accordance with USNRC 10 CFR 61 and DOE 5820.2 criteria. Low-Level and Transuranic waste assay systems have been developed to efficiently assay and classify the waste packages. The waste is assayed by segmented gamma scanning, passive neutron techniques, dose rate conversion, and/or radiochemical laboratory analysis. The systems are capable of handling all the waste forms currently packaged as part of the Project. The above systems produce a list of nuclides present with their concentrations and determines the classification of the waste packages based on criteria outlined in DOE Order 5820.2 and USNRC 10 CFR 61.55. 9 refs., 12 figs., 8 tabs.
Major descriptors: *radioactive wastes -- chemical analysis; *radioactive wastes -- classification; *radioactive wastes -- packaging; *west valley processing plant -- decommissioning; *west valley processing plant -- decontamination
Descriptors: alpha spectroscopy; alpha-bearing wastes; gamma spectroscopy; low-level radioactive wastes; radiochemical analysis; separation processes
Broader Terms: chemical analysis; cleaning; fuel reprocessing plants; materials; nuclear facilities; quantitative chemical analysis; radioactive materials; radioactive wastes; spectroscopy; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
400100 -- Analytical & Separations Chemistry
INIS Subject Categories: E5100* -- Waste Treatment
B1100 -- Chemical & Isotopic Analysis

Citation 141

<DIALOG File 103: >
01916080 EDB-87-043733
Author(s): Gilbert, T.L.; Meshkov, N.K.
Title: Waste-acceptance criteria for greater-confinement disposal
Corporate Source: Argonne National Lab., IL (USA)
Conference Title: 8. annual participants' information meeting of the DOE Low-Level Waste Management Program
Conference Location: Denver, CO, USA Conference Date: 22 Sep 1986
Publication Date: 1986 p 16
Report Number(s): CONF-860990-14
Order Number: DE87004672
Contract Number (DOE): W-31109-ENG-38
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA8703
Availability: NTIS, PC A02/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: A methodology for establishing waste-acceptance criteria based on quantitative performance factors that characterize the confinement capabilities of a waste-disposal site and facility has been developed. The methodology

starts from the basic objective of protecting public health and safety by providing assurance that dispsoal of the waste will not result in a radiation dose to any member of the general public, in either the short or long term, in excess of an established basic dose limit. The method is based on an explicit, straightforward, and quantitative relationship among individual risk, confinement capabilities, and waste characteristics. A key aspect of the methodology is the introduction of a confinement factor that characterizes the overall confinement capability of a particular facility and can be used for quantitative assessments of the performance of different disposal sites and facilities, as well as for establishing site-specific waste-acceptance criteria. Confinement factors are derived by means of site-specific pathway analyses. They make possible a direct and simple conversion of a basic dose limit into waste-acceptance criteria, specified as concentration limits on radionuclides in the waste streams and expressed in quantitative form as a function of parameters that characterize the site, facility design, waste containers, and waste form. Waste-acceptance criteria can be represented visually as activity/time plots for various waste streams. These plots show the concentrations of radionuclides in a waste stream as a function of time and permit a visual, quantitative assessment of long-term performance, relative risks from different radionuclides in the waste stream, and contributions from ingrowth. 13 refs.
Major descriptors: *radioactive waste facilities -- inspection; *radioactive wastes -- classification; *radioactive wastes -- inspection; *radioactive wastes -- radiation protection; *radioactive wastes -- risk assessment
Descriptors: radioactive waste disposal; time dependence
Broader Terms: management; materials; nuclear facilities; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 142

<DIALOG File 103: >
01909945 EDB-87-037597
Title: Cost effectiveness of below-threshold waste disposal at DOE sites
Author(s): Wickham, L.E.; Smith, C.F.; Cohen, J.J.
Affiliation: EG and G Idaho, Idaho Falls
Conference Title: American Nuclear Society and Atomic Industrial Forum joint meeting
Conference Location: Washington, DC, USA Conference Date: 16 Nov 1986
Source: Trans. Am. Nucl. Soc. (United States) v 53. Coden: TANSA
Publication Date: 1986 p 116
Report Number(s): CONF-861102-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8703
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: Previous study has indicated the feasibility of establishing a threshold of concentration below which certain low-level (radioactive wastes) (LLW) could be safely handled and disposed of by conventional means such as landfills. Such below-threshold wastes have been synonymously termed de minimis or below regulatory concern (BRC) and can be deemed appropriate for management according to their nonradiological characteristics. The objective of this study was to determine the cost effectiveness for management and disposal of below-threshold waste at certain US Department of Energy sites. The sites selected for this study were the Idaho National Engineering Laboratory and Savannah River Laboratory. Cost-benefit analysis was used to determine the impacts, benefits, and potential cost advantages of establishing and implementing a threshold limit.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste disposal -- cost benefit analysis
Descriptors: economics; idaho national engineering laboratory; quality assurance; quantity ratio; radiation protection; radioactive waste management; savannah river plant; us doe
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes

Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 143

<DIALOG File 103: >
01909940 EDB-87-037592
Title: Disposal of BRC wastes containing short-lived radionuclides
Author(s): Rogers, V.C.; Baird, R.D.
Affiliation: Rogers and Associates Engineering Corp., Salt Lake City, UT
Conference Title: American Nuclear Society and Atomic Industrial Forum joint meeting
Conference Location: Washington, DC, USA Conference Date: 16 Nov 1986
Source: Trans. Am. Nucl. Soc. (United States) v 53. Coden: TANSA
Publication Date: 1986 p 97-98
Report Number(s): CONF-861102-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8703
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: As part of its responsibility for the safe disposal of low-level (radioactive) waste (LLW), the Texas Low-Level Radioactive Waste Disposal Authority sponsored an analysis of the use of permitted sanitary landfills for the disposal of wastes containing only low concentrations of radionuclides with half-lives of <300 days. Analyses have been performed giving limits on concentrations and total curies annually disposed for 56 short-lived radionuclides. The Low-Level Radioactive Waste Policy Amendments Act, enacted in December 1985, has directed the US Nuclear Regulatory Commission (NRC) to develop standards and procedures for considering and acting on petitions for below regulatory concern (BRC) radioactive waste disposal within 6 months. The NRC has developed a de minimis biomedical waste disposal rule for H-3 and C-14 that places limits on concentrations that can be disposed of without regard to radioactivity. Likewise, the US Environmental Protection Agency (EPA) is developing a regulation for the disposal of BRC radioactive wastes in a sanitary landfill as part of their LLW disposal rulemaking. The purpose of this study is to: 1) conduct multipathway risk assessments using the same methodology that is being used by the EPA for the technical support of their BRC rulemaking; 2) obtain radionuclide concentration and annual total curie limits from the results of the risk assessments by limiting the health impacts to guideline values used in this analysis; and 3) present other restrictions or conditions that emerge from the analysis.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: activity levels; educational facilities; hospitals; industry; quantity ratio; radiation doses; radiation hazards; radioisotopes; radionuclide migration; regulations; risk assessment; sanitary landfills; US EPA; US NRC
Broader Terms: buildings; doses; environmental transport; hazards; health hazards; isotopes; management; mass transfer; materials; medical establishments; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 144

<DIALOG File 103: >
01909936 EDB-87-037588
Title: Defining greater-than-class-C low-level radioactive waste
Author(s): Knecht, M.A.; Oztunali, O.I.
Affiliation: Idaho National Engineering Lab., Idaho Falls
Conference Title: American Nuclear Society and Atomic Industrial Forum joint meeting

Conference Location: Washington, DC, USA Conference Date: 16 Nov 1986
Source: Trans. Am. Nucl. Soc. (United States) v 53. Coden: TANSA
Publication Date: 1986 p 94-95
Report Number(s): CONF-861102-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8703
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) was signed by President Reagan on January 15, 1986. This act requires the federal government to be responsible for the disposal of greater-than-class-C low-level radioactive waste (LLRW) that is generated commercially by state agencies and by federal entities (other than waste generated by atomic weapons research, development, or testing, or by decommissioning of vessels of the nuclear navy). To plan for disposal, the federal government will require estimates of the volume of waste involved and characterization of this waste. A clear definition of greater-than-class-C LLRW is the first step in determining what wastes will be included in the waste to be received by the federal government. This definition will influence major policy decisions to be made for management of such waste. The purpose of this paper is to examine the existing information on greater-than-class-C LLRW in view of the current definition of such waste and potential changes in this definition - for example, an upper limit on the concentrations of radionuclides in LLRW. The paper identifies further information needs to develop a clear definition of such waste for use in federal planning for acceptance of responsibility for disposal of such waste.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal
Descriptors: planning; radioisotopes; research programs; spent fuels; US DOE
Broader Terms: energy sources; fuels; isotopes; management; materials; national organizations; nuclear fuels; radioactive materials; radioactive wastes; reactor materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 145

<DIALOG File 103: >
01909864 EDB-87-037516
Title: Approach to defining de minimis, intermediate, and other classes of radioactive waste
Author(s): Cohen, J.J.; Smith, C.F.
Affiliation: SAIC, Pleasanton, CA
Conference Title: American Nuclear Society and Atomic Industrial Forum joint meeting
Conference Location: Washington, DC, USA Conference Date: 16 Nov 1986
Source: Trans. Am. Nucl. Soc. (United States) v 53. Coden: TANSA
Publication Date: 1986 p 100-102
Report Number(s): CONF-861102-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8703
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: This study has developed a framework within which the complete spectrum of radioactive wastes can be defined. An approach has been developed that reflects both concerns in the framework of a radioactive waste classification system. In this approach, the class of any radioactive waste stream is dependent on its degree of radioactivity and its persistence. To be consistent with conventional systems, four waste classes are defined. In increasing order of concern due to radioactivity and/or duration, these are: 1. De Minimis Wastes: This waste has such a low content of radioactive material that it can be considered essentially nonradioactive and managed according to its nonradiological characteristics. 2. Low-Level Waste (LLW): Maximum concentrations for wastes considered

to be in this class are prescribed in 10CFR61 as wastes that can be disposed of by shallow land burial methods. 3. Intermediate Level Waste (ILW): This category defines a class of waste whose content exceeds class C (10CFR61) levels, yet does not pose a sufficient hazard to justify management as a high-level waste (i.e., permanent isolation by deep geologic disposal). 4. High-Level Waste: HLW poses the most serious management problem and requires the most restrictive disposal methods. It is defined in NWPA as waste derived from the reprocessing of nuclear fuel and/or as highly radioactive wastes that require permanent isolation.
Major descriptors: *high-level radioactive wastes -- radioactive waste disposal; *intermediate-level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste management -- classification
Descriptors: activity levels; radiation hazards; regulations; spent fuels
Broader Terms: energy sources; fuels; hazards; health hazards; management; materials; nuclear fuels; radioactive materials; radioactive wastes; reactor materials; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 146

<DIALOG File 103: >
01909863 EDB-87-037515
Title: Proposed classification scheme for high-level and other radioactive wastes
Author(s): Kocher, D.C.; Croff, A.G.
Affiliation: Oak Ridge National Lab., TN
Conference Title: American Nuclear Society and Atomic Industrial Forum joint meeting
Conference Location: Washington, DC, USA Conference Date: 16 Nov 1986
Source: Trans. Am. Nucl. Soc. (United States) v 53. Coden: TANSA
Publication Date: 1986 p 98-100
Report Number(s): CONF-861102-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8703
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: The Nuclear Waste Policy Act (NWPA) of 1982 defines high-level (radioactive) waste (HLW) as (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel...that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the Commission...determines...requires permanent isolation. This paper presents a generally applicable quantitative definition of HLW that addresses the description in paragraph B. The approach also results in definitions of other wastes classes, i.e., transuranic (TRU) and low-level waste (LLW). The basic waste classification scheme that results from the quantitative definitions of highly radioactive and requires permanent isolation is depicted. The concentrations of radionuclides that correspond to these two boundaries, and that may be used to classify radioactive wastes, are given.
Major descriptors: *high-level radioactive wastes -- classification; *high- level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- radioactive waste disposal; *transuranium compounds -- radioactive waste disposal
Descriptors: cesium 137; fission products; intermediate-level radioactive wastes; quantity ratio; radiation hazards; radioactive waste management; spent fuels; strontium 90; US NRC
Broader Terms: alkali metal isotopes; alkaline earth isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; cesium isotopes; energy sources; even-even nuclei; fuels; hazards; health hazards; intermediate mass nuclei; isotopes; management; materials; national organizations; nuclear fuels; nuclei; odd-even nuclei; radioactive materials; radioactive wastes; radioisotopes; reactor materials; strontium isotopes; us organizations; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 147

<DIALOG File 103: >
01861932 AIX-17-082063; EDB-86-185826
Author(s): Saro, S.; Toelgyessy, J.
Title: Environmental radioactivity
Original Title: Radioaktivita prostredia
Publisher: Alfa,Bratislava, Czechoslovakia
Publication Date: 1985 p 304
Document Type: Book
Language: Slovak
Journal Announcement: EDB8611
Subfile: INIS (non-US Atomindex input AIX)
Country of Origin: Czechoslovakia
Country of Publication: Czechoslovakia
Abstract: Current knowledge is surveyed of natural and artificial environmental radioactivity and its sources with respect to the present-day biological and ecological problems. Basic data are presented on radioactive transformations, properties of radiation and radiation protection. Attention is paid to decay series, cosmic radiation interaction with the Earth surface, nuclear explosions and radioactive fallout. The problems are discussed of uranium ore mining and processing. The questions of nuclear power plants, fuel reprocessing and radioactive waste classification and disposal are dealt with in detail. The methods are also discussed of environmental radioactivity monitoring and control and of determining individual radionuclides. (J.C.). 80 figs., 33 tables.
major descriptors: *environment -- radioactivity
Descriptors: biosphere; chemical analysis; ionizing radiations; nuclear explosions; nuclear power plants; radiation monitoring; radiation protection; radioactive wastes; radioisotopes; uranium ores
Broader Terms: environment; explosions; isotopes; materials; monitoring; nuclear facilities; ores; power plants; radiations; radioactive materials; thermal power plants; wastes
Subject Categories: 500300* -- Environment, Atmospheric -- Radioactive Materials Monitoring & Transport -- (-1989)
510301 -- Environment, Terrestrial -- Radioactive Materials Monitoring & Transport -- Soil -- (-1987)
INIS Subject Categories: B3310* -- Radioactive materials monitoring & transport; meteorology
B3110 -- Radioactive materials monitoring & transport

Citation 148

<DIALOG File 103: >
01857787 AIX-17-074113; EDB-86-181680
Title: Current status of radioactive waste management in Japan
Author(s): Amanuma, Tsuyoshi
Affiliation: Nuclear Safety Research Association, Tokyo, Japan
Source: Kagaku Kogaku (Japan) v 49:7. Coden: KKGKA
Publication Date: Jul 1985 p 493-498
Note: For English translation see the journal Journal of Chemical Engineering of Japan, Japan
Document Type: Journal Article
Language: Japanese
Journal Announcement: EDB8610
Subfile: INIS (non-US Atomindex input AIX)
Country of Origin: Japan
Abstract: In Japan the nuclear power generation capacity now exceeds the level of 20,000 MW, 24.3% of the total power generation. It constitutes the major position of energy source, a substitute for a petroleum. In the nuclear power, chemical engineering contributes significantly to treatment and disposal of the radioactive wastes. In the interim report by an ad hoc committee in the Atomic Energy Commission, for the future, rational grouping of the wastes and the direction of land disposal are stated. Contents are the following: basic ideas for the radioactive

wastes, radioactive wastes countermeasures in Japan (wastes classification, low and high level and transuranic wastes), radioactive wastes in the nuclear fuel cycle (reactor and fuel reprocessing and reactor dismantling wastes).
Major descriptors: *radioactive waste disposal -- research programs; *radioactive waste processing -- research programs
Descriptors: alpha-bearing wastes; fuel cycle; high-level radioactive wastes; japan; low-level radioactive wastes; planning
Broader Terms: asia; management; materials; processing; radioactive materials; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal

Citation 149

<DIALOG File 103: >
01850634 NOV-85-021860; EDB-86-174524
Title: A program for volume reduction, packaging and disposal of activated core components stored in BWR fuel pools
Author(s): Roth, P.; Hauf, M.J.; Enegess, D.N.; Post, R.G.
Affiliation: Commonwealth Edison Co.
Title: Waste management 86. Volume 3: Low level waste
Conference Title: Waste management '86
Conference Location: Tucson, AZ, USA Conference Date: 2 Mar 1986
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1986 p 459-462
Report Number(s): CONF-860317-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8610
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The volume reduction and disposal of discharged Boiling Water Reactor (BWR) core components stored in the spent fuel pools is discussed, including the application of state-of-the-art waste processing and characterization technology. The results of applying these technologies to a fuel pool cleanup project are reduced in-pool processing time and substantially reduced shipping and burial charges to the utility. The vendor, WasteChem Corporation, employed their Underwater Shear Compactor (USC) technology at Commonwealth Edison's Dresden Station to volume reduce control rod blades and Local Power Range Monitors (LPRMs). Volume reduction yielded substantially more payload per shipment through an increased packaging efficiency. In addition, shipments were optimized on the basis of volume, heat load, Curie content, and shielding considerations to permit the selection of the least expensive cask available for a given type of waste. A description is provided of the following: 1. Project management and coordination among operating departments; 2. 10CFR61 waste classification methodology; 3. Processing and shipping technology; 4. Economic factors.
Major descriptors: *dresden-1 reactor -- radioactive waste disposal; *dresden-1 reactor -- radioactive waste processing; *dresden-1 reactor -- waste transportation; *dresden-2 reactor -- radioactive waste disposal; *d resden-2 reactor -- radioactive waste processing; *dresden-2 reactor -- waste transportation; *dresden-3 reactor -- radioactive waste disposal; *dresden-3 reactor -- radioactive waste processing; *dresden-3 reactor -- waste transportation
Descriptors: casks; classification; compactors; control elements; curie point; decontamination; economics; fuel pools; heating load; low-level radioactive wastes; packaging; power meters; program management; reactor cores; regulations; shielding; time dependence; underground disposal; volume
Broader Terms: BWR type reactors; cleaning; containers; electric measuring instruments; electrical equipment; enriched uranium reactors; equipment; management; materials; measuring instruments; meters; physical properties;

power reactors; processing; radioactive materials; radioactive wastes; reactor components; reactors; thermal reactors; thermodynamic properties; transition temperature; transport; waste disposal; waste management; waste processing; wastes; water cooled reactors; water moderated reactors
Subject Categories: 220502* -- Nuclear Reactor Technology -- Environmental Aspects -- Radioactive Effluents
210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
052001 -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
050900 -- Nuclear Fuels -- Transport, Handling, & Storage
INIS Subject Categories: C5220* -- Environmental aspects of radioactive effluent from existing nuclear installations
E3100 -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types)
E5100 -- Waste Treatment
E5200 -- Waste Disposal
E1510 -- Transport & storage

Citation 150

<DIALOG File 103: >
01849658 AIX-17-074145; EDB-86-173548
Title: Management of radioactive wastes arising from the use of Australian radioisotopes
Author(s): Costello, J.M.
Affiliation: Australian Atomic Energy Commission Research Establishment, Lucas Heights
Conference Title: Australian Radiation Protection Society annual meeting
Conference Location: Melbourne, Australia Conference Date: 19 Aug 1985
Source: Radiat. Prot. Aust. (Australia) v 4:1. Coden: RPAUD
Publication Date: Jan 1986 p 3-10
Report Number(s): CONF-850844-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8610
Subfile: INIS (non-US Atomindex input AIX)
Country of Origin: Australia
Abstract: The medical, industrial and research use of radioisotopes in Australia has given rise to approximately 30 m/sup 3/ of solid radioactive waste containing about 5 TBq of radioactivity. This waste is stored at State hospitals, universities and research centres. A further 10 m/sup 3/ of waste containing 300 GBq of radioactivity is stored by the Commonwealth at the St. Mary's Munitions Filling factory. About 700 m/sup 3/ of waste containing 1.5 PBq of radioactivity resulting from operation of the HIFAR nuclear reactor and the production of radioisotopes is in storage at the Lucas Heights Research Establishment. The source, nature and rate of arising of these wastes is reviewed, together with national developments in waste classification, storage procedures and eventual disposal. Some research at Lucas Heights on the conditioning of radioisotope waste to facilitate disposal is briefly noted.
Major descriptors: *australia -- radioactive waste disposal; *australia -- radioactive waste facilities; *australia -- radioactive waste storage
Descriptors: cost; ground disposal; radioactive waste processing; radioactive wastes; storage facilities
Broader Terms: australasia; management; materials; nuclear facilities; processing; radioactive materials; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 151

<DIALOG File 103: >
01849541 NOV-85-021801; EDB-86-173431
Title: Implementation of a non-contaminated waste segregation and environmental control program at a large

Canadian utility
Author(s): Spooner, P.; Lemkay, K.; Post, R.G.
Affiliation: Ontario Hydro, 700 Univ. Avenue, Toronto, Ontario M5G 1X6
Title: Waste management 86. Volume 3: Low level waste
Conference Title: Waste management '86
Conference Location: Tucson, AZ, USA Conference Date: 2 Mar 1986
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1986 p 119-124
Report Number(s): CONF-860317-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8610
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: Canada
Country of Publication: United States
Abstract: A study of the monitoring of non-radioactive solid waste in bags recommended changes in monitoring methods and practices. A program has been carried out over an 8-month period using a large volume gamma monitor. The monitoring was carried out in a central area which also considered the requirements for handling and shipping of the active and inactive wastes. The results indicate that residual quantities of radioactivity in the inactive waste bags, were not detectable with conventional portable monitoring instruments, that the average specific radioactivity of the inactive waste stream was reduced, and that 40% of the nominally active waste could be classified as inactive. Use of the monitor is considered to improve environmental control for non-radioactive solid wastes and provide economic benefits.
Major descriptors: *canada -- radioactive waste management; *electric utilities -- radioactive waste management; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactivity; *low-level radioactive wastes -- waste transportation; *nuclear power plants -- radioactive waste management
Descriptors: economics; materials handling; portable equipment; radiation monitoring; radiation monitors; solid wastes; waste forms
Broader Terms: equipment; management; materials; measuring instruments; monitoring; monitors; north america; nuclear facilities; power plants; public utilities; radioactive materials; radioactive wastes; thermal power plants; transport; waste management; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
050900 -- Nuclear Fuels -- Transport, Handling, & Storage
INIS Subject Categories: E5100* -- Waste Treatment
E1510 -- Transport & storage

Citation 152

<DIALOG File 103: >
01849540 NOV-85-021800; EDB-86-173430
Title: Updating scaling factors for 10 CFR Part 61
Author(s): Best, W.T.; Miller, A.D.; Robinson, P.J.; Post, R.G.
Affiliation: Impell Corp., Walnut Creek, CA
Title: Waste management 86. Volume 3: Low level waste
Conference Title: Waste management '86
Conference Location: Tucson, AZ, USA Conference Date: 2 Mar 1986
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1986 p 113-118
Report Number(s): CONF-860317-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8610
Subfile: INS (US Atomindex input). NOV (DOE contractor)

Country of Origin: United States
Country of Publication: United States
Abstract: Part 61, Title 10 of the Code of Federal Regualtions (10CFR61) has been in force since December 1983. Since then waste generators have been sending samples for offsite analyses (at considerable cost) to better quantify the difficult-to-measure nuclides in their waste streams. In addition to the results obtained from the laboratories, many utilities have been relying on the results from previous work in this area including the Atomic Industrial Forum's report which was based on first principles and the Electric Power Research Institute's (EPRI) report which was based on operational data obtained from nuclear utilities. The utilities use these data to compare/contrast their actual results to those obtained industry wide. This paper presents results of the data gathered from the nuclear utilities. These data represents about five million dollars in analytical costs spent by the utilities in their compliance programs. The paper includes a statistical analyses of the raw data obtained to further conclusions previously developed and to realize new correlations. These new data will be of greater significance than the previous data as the obtained data obtained from the utilities was specific to 10 CFR Part 61 whereas most of the previous 700 data points were obtained from sources with little or no relationship to 10CFR61. In addition, the conclusions drawn from the previous work were extended to include these new data, and the data applied to determine actual generation states of the 10CFR61 nuclides in lower-level waste.
Major descriptors: *contamination regulations -- compliance; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- contamination regulations; *low-level radioactive wastes -- radioactivity; *low-level radioactive wastes -- scaling laws
Descriptors: BWR type reactors; data acquisition; data analysis; data base management; electric utilities; EPRI; iodine 129; nuclear power plants; sampling; statistics
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; isotopes; management; materials; mathematics; nuclear facilities; nuclei; odd-even nuclei; pollution regulations; power plants; public utilities; radioactive materials; radioactive wastes; radioisotopes; reactors; regulations; thermal power plants; wastes; water cooled reactors; water moderated reactors; years living radioisotopes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5100* -- Waste Treatment

Citation 153

<DIALOG File 103: >
01849517 NOV-85-024393; EDB-86-173407
Title: Issues related to mixed radioactive waste management: The EPA perspective
Author(s): Lehman, J.P.; Post, R.G.
Affiliation: U.S. Environmental Protection Agency, Washington, DC
Title: Waste management 86. Volume 1:General interest
Conference Title: Waste management '86
Conference Location: Tucson, AZ, USA Conference Date: 2 Mar 1986
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1986 p 611-612
Report Number(s): CONF-860317-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8610
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The subject of mixed hazardous and radioactive waste is complex. Regulatory problems arise when wastes are both hazardous and radioactive. Three Federal agencies are primarily responsible for the management of such waste. The Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA), but some of these wastes are also radioactive. Low-level nuclear wastes are controlled by the Nuclear Regulatory Commission (NRC) under the Atomic Energy Act (AEA), but some of these are also

hazardous wastes and are thus also subject to EPA control under RCRA. Finally, many wastes from Department of Energy (DOE) facilities are mixed hazardous and radioactive waste and are thus regulated under the AEA and RCRA. In addition, most States have regulatory powers over mixed wastes. EPA, NRC, and DOE are attempting to solve the problem of regulating such wastes to avoid duplicate permitting and oversight where appropriate.
Major descriptors: *hazardous materials -- classification; *hazardous materials -- regulations; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- regulations
Descriptors: atomic energy act; construction permits; intergovernmental cooperation; mixtures; permit applications; resource recovery acts; state government; US DOE; US EPA; US NRC
Broader Terms: administrative procedures; atomic energy laws; cooperation; dispersions; laws; licenses; materials; national organizations; permits; radioactive materials; radioactive wastes; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
290300 -- Energy Planning & Policy -- Environment, Health, & Safety
290600 -- Energy Planning & Policy -- Nuclear Energy
293000 -- Energy Planning & Policy -- Policy, Legislation, & Regulation
INIS Subject Categories: E5000* -- Waste Management
F1400 -- Social Impact of Nuclear Science & Technology

Citation 154

<DIALOG File 103: >
01849513 NOV-85-024373; EDB-86-173403
Title: Identification of radioactive mixed wastes in commercial low-level wastes
Author(s): Bowerman, B.S.; Kempf, C.R.; MacKenzie, D.R.; Siskind, B.; Piciulo, P.L.; Post, R.G.
Affiliation: Dept. of Nuclear Energy, Brookhaven National Lab., Upton, NY 11973
Title: Waste management 86. Volume 1:General interest
Conference Title: Waste management '86
Conference Location: Tucson, AZ, USA Conference Date: 2 Mar 1986
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1986 p 499-502
Report Number(s): CONF-860317-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8610
Subfile: INS (US Atomindex input); EPA (Energy Abstracts for Policy Analysis); ERA (Energy Research Abstracts). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: A literature review and survey were conducted on behalf of the U.S. NRC Division of Waste Management to determine whether any commercial low-level radioactive wastes (LLW) could be considered hazardous as defined by EPA under 40 CFR Part 261. The purpose of the study was to identify broad categories of LLW which may require special management as radioactive mixed waste, and to help address uncertainties regarding the regulation of such wastes. Of 239 questionnaires sent out to reactor and non-reactor LLW generators, there were 91 responses representing 29% by volume of all low-level wastes disposed of at commercial disposal sites in 1984. The analysis of the survey results indicated that the following waste types generic to commercial LLW may be potential radioactive mixed wastes: wastes containing oil, disposed of by reactors and industrial facilities, and representing 4.2% of the total LLW volume reported in the survey; wastes containing organic liquids, disposed of by all types of generators, and representing 2.3% by volume of all wastes reported; wastes containing lead metal, i.e., discarded shielding and lead containers, representing <0.1% by volume of all wastes reported; and wastes containing chromium, i.e., process wastes from nuclear power plants which use chromates as corrosion inhibitors; these represent 0.6% of the total volume reported in the survey. Certain wastes, specific to particular generators, were identified as potential mixed wastes as well.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste management; *low-level radioactive wastes -- regulations

Descriptors: chromates; chromium; commercial sector; corrosion inhibitors; industrial plants; lead; mixtures; nuclear power plants; organic compounds; power reactors; shielding; surveys; US NRC; volume; waste oils
Broader Terms: chromium compounds; dispersions; elements; management; materials; metals; national organizations; nuclear facilities; oils; organic compounds; other organic compounds; oxygen compounds; power plants; radioactive materials; radioactive wastes; reactors; thermal power plants; transition element compounds; transition elements; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
290600 -- Energy Planning & Policy -- Nuclear Energy
293000 -- Energy Planning & Policy -- Policy, Legislation, & Regulation
INIS Subject Categories: E5000* -- Waste Management
F1400 -- Social Impact of Nuclear Science & Technology

Citation 155

<DIALOG File 103: >
01832877 EDB-86-156757
Title: Future considerations for low-level waste treatment
Author(s): Person, L.S.; Godbee, H.W.; Frederick, E.J.; Jolley, R.L.; Kibbey, A.H.; Rodgers, B.R. (comps.)
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Low-level radioactive waste from commercial nuclear reactors. Volume 4. Proceedings of the workshop on research and development needs for treatment of low-level radioactive waste from commercial nuclear reactors
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: Workshop on research and development needs for treatment of low-level radioactive waste from commercial nuclear reactors
Conference Location: Arlington, VA, USA Conference Date: 19 Aug 1985
Publication Date: May 1986 p 31-34
Report Number(s): ORNL/TM-9846-Vol.4; CONF-8508182-Vol.4
Order Number: DE86012490
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8610
Availability: NTIS, PC A09/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Future treatment of low-level radioactive waste will most likely be governed new disposal techniques (including packaging and processing) and must be considered in the light of any changing regulatory requirements. This section will focus on current stability and classification requirements for low-level waste forms and examine how the current criteria (established to ensure stability) must be considered prior to preparing low-level waste forms for disposal.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste processing
Descriptors: radioactive waste disposal; stability; standards
Broader Terms: management; materials; processing; radioactive materials; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E5100* -- Waste Treatment
F2800 -- Nuclear Law -- Nuclear Disarmament, Safeguards & Physical Protection

Citation 156

<DIALOG File 103: >
01832856 EDB-86-156736
Title: Problems have solutions
Author(s): Hobart, S.A.; Godbee, H.W.; Frederick, E.J.; Jolley, R.L.; Kibbey, A.H.; Rodgers, B.R. (comps.)
Affiliation: Electric Power Research Institute, Palo Alto, CA
Title: Low-level radioactive waste from commercial nuclear reactors. Volume 4. Proceedings of the workshop on research and development needs for treatment of low-level radioactive waste from commercial nuclear reactors
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: Workshop on research and development needs for treatment of low-level radioactive waste from commercial nuclear reactors
Conference Location: Arlington, VA, USA Conference Date: 19 Aug 1985
Publication Date: May 1986 p 35-50
Report Number(s): ORNL/TM-9846-Vol.4; CONF-8508182-Vol.4
Order Number: DE86012490
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8610
Availability: NTIS, PC A09/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: An attempt is made to identify the forms and sources of low-level radioactive wastes. The current problems related to these forms and sources are discussed. In addition, ongoing activities in search of Molutions to these problems are described.
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: information needs; radioactive waste management
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 157

<DIALOG File 103: >
01811594 NOV-85-014079; INS-86-024199; EDB-86-135464
Title: Analytical techniques for the in situ quantification and characterization of radioactive decommissioning wastes
Author(s): Lubaszewski, R.T.; Cline, J.E.; Bierman, M.R.; Lee, S.G.; Baumann, B.L.; Edwards, K.M.
Affiliation: Science Applications International Corp.
Title: Proceedings of the international nuclear reactor decommissioning planning conference
Conference Title: International nuclear reactor decommissioning planning conference
Conference Location: Bethesda, MD, USA Conference Date: 16 Jul 1985
Publisher: Government Printing Office,Washington, DC
Publication Date: 1985 p 310-330
Report Number(s): CONF-850720-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8607
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: A direct-assay technique quantitatively assays and characterizes the nuclides (including all 10CFR61 nuclides) present in fuel pool stored components. Materials analyzed include control rod blades, LPRMs, flow channels, vacuum filters, and many other miscellaneous components stored underwater. The system, based on advanced gamma-ray spectroscopy scanning techniques, combines scanning with scaling factors, obtaining from

direct sample analysis, and dose-rate profiling to give a complete waste analysis that allows accurate and cost effective classification for packaging, shipment, and burial. The methodology (1) improves accuracy by providing direct measurement of the components being shipped, (2) allows a more knowledgable and cost effective packaging of items in a shipping container or cask, and (3) reduces burial costs by allowing less conservative estimates of total Curies shipped in each container. Several recent applications of the methods are presented and the results discussed.
Major descriptors: *power reactors -- radioactive waste disposal; *radioactive wastes -- classification; *radioactive wastes -- radioassay; *reactor decommissioning -- contamination regulations
Descriptors: away-from-reactor storage; charges; fuel pools; gamma spectroscopy; implementation; quantitative chemical analysis; radioactive materials; radioactivity; reactor components; underground storage; underwater; waste transportation
Broader Terms: chemical analysis; decommissioning; levels; management; materials; pollution regulations; radioactive materials; reactors; regulations; spectroscopy; spent fuel storage; storage; transport; waste disposal; waste management; wastes
Subject Categories: 220900* -- Nuclear Reactor Technology -- Reactor Safety
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E3000* -- Specific Fission Reactor Types & Their Associated Plants
E5200 -- Waste Disposal

Citation 158

<DIALOG File 103: >
01811591 NOV-85-014076; INS-86-024196; ERA-11-004384; EDB-86-135461
Title: Classification of reactor decommissioning wastes
Author(s): Murphy, E.S.; Feldman, C.; Cardile, F.P.; Baumann, B.L.; Edwards, K.M.
Affiliation: Battelle Memorial Inst., Pacific Northwest Lab., Richland, WA
Title: Proceedings of the international nuclear reactor decommissioning planning conference
Conference Title: International nuclear reactor decommissioning planning conference
Conference Location: Bethesda, MD, USA Conference Date: 16 Jul 1985
Publisher: Government Printing Office,Washington, DC
Publication Date: 1985 p 247-256
Report Number(s): CONF-850720-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8607
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Nuclear wastes expected from the conceptual decommissioning of a reference PWR and a reference BWR have been reviewed in terms of the waste classification requirements of 10 CFR 61 to determine the suitability of these wastes for disposal by shallowland burial. Most of the nuclear waste from LWR decommissioning (approximately 80% to 98% of the total waste volume, depending on reactor type and decommissioning alternative) is considered to have radionuclide concentrations that permit its classification as Class A waste. A relatively small amount of the waste (approximately 1% to 15% of the total waste volume, depending on reactor type and decommissioning alternative) is considered to be Class B waste. Some neutron-activated stainless-steel reactor vessel internals with high concentrations of /sup 59/Ni, /sup 63/Ni, and /sup 94/Nb are considered to be either Class C waste or waste that exceeds Class C limits.
Major descriptors: *BWR type reactors -- radioactive waste disposal; *BWR type reactors -- reactor decommissioning; *PWR type reactors -- radioactive waste disposal; *PWR type reactors -- reactor decommissioning; *radioactive wastes -- classification; *reactor decommissioning -- radioactive wastes; *reactor materials -- underground disposal
Descriptors: nickel 59; nickel 63; niobium 94; radioactivation; radioactivity; reactor components; reactor vessels; regulations; reviews; stainless steels
Broader Terms: alloys; beta decay radioisotopes; beta-minus decay radioisotopes; chromium alloys; containers;

corrosion resistant alloys; decommissioning; document types; electron capture radioisotopes; even-odd nuclei; intermediate mass nuclei; internal conversion radioisotopes; iron alloys; iron base alloys; isomeric transition isotopes; isotopes; management; materials; minutes living radioisotopes; nickel isotopes; niobium isotopes; nuclei; odd-odd nuclei; radioactive materials; radioisotopes; reactors; steels; waste disposal; waste management; wastes; water cooled reactors; water moderated reactors; years living radioisotopes
Subject Categories: 220900* -- Nuclear Reactor Technology -- Reactor Safety
210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E3000* -- Specific Fission Reactor Types & Their Associated Plants
E3100 -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types)
E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)
E5200 -- Waste Disposal

Citation 159

<DIALOG File 103: >
01811203 INS-86-023963; ERA-11-004147; EDB-86-135072
Title: Radionuclide correlations in low-level waste
Author(s): Miller, A.D.; Shaw, R.A.; Robinson, P.
Conference Title: American Nuclear Society winter meeting
Conference Location: San Francisco, CA, USA Conference Date: 10 Nov 1985
Source: Trans. Am. Nucl. Soc. (United States) v 50. Coden: TANSA
Publication Date: Nov 1985 p 89
Report Number(s): CONF-851115-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8608
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). JMT(DOE contractor)
Country of Origin: United States
Abstract: Over the past 3 yr, utilities have developed compliance programs for the rule promulgated by the US Nuclear Regulatory Commission that requires the classification of low-level waste into three classes, A, B, and C. This classification, defined in 10CFR61, is left up to the waste generator and is based on the concentrations of various radionuclides in the final waste form. The methodology most applicable to power plants involves scaling difficult-to-measure nuclides to those which are both easy to measure and possess similar chemical and physical properties. This methodology has been in use for several years in determining the transuranic content of waste based on the /sup 144/Ce concentration. The NRC has accepted this technique and has in fact suggested its extension to the problem nuclides listed in 10CFR61. The purpose of this report is to summarize the work done by Impell Corporation for the Electric Power Research Institute. A data base of approx. 700 waste analyses was collected and used to develop and support a scaling factor methodology. Important differences exist between boiling water reactors and pressurized water reactors which preclude the use of common scaling factors. In fact, important differences between substantially similar plant types may prevent generically categorized scaling factors from being used. However, the work reported here has determined that several of the difficult-to-measure nuclides can be scaled on a generic basis.
Major descriptors: *BWR type reactors -- low-level radioactive wastes; *low-level radioactive wastes -- classification; *PWR type reactors -- low-level radioactive wastes
Descriptors: carbon 14; cerium 144; cesium 137; gamma radiation; iodine 129; nickel 63; quantity ratio; radioactive waste management; regulations; scaling laws; technetium 99; transuranium elements; US NRC
Broader Terms: alkali metal isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cerium isotopes; cesium isotopes; days living radioisotopes; electromagnetic radiation; elements; even-even nuclei; even-odd nuclei; hours living radioisotopes; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; ionizing radiations; isomeric transition isotopes; isotopes; light nuclei; management; materials; national organizations; nickel isotopes; nuclei; odd-even nuclei; radiations; radioactive materials; radioactive wastes;

radioisotopes; rare earth isotopes; rare earth nuclei; reactors; technetium isotopes; waste management; wastes; water cooled reactors; water moderated reactors; years living radioisotopes
Subject Categories: 210100* -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E3100* -- Power Reactors, Nonbreeding, Light Water Moderated, Boiling Water Cooled (BWR, etc types)
E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)
E5000 -- Waste Management

Citation 160

<DIALOG File 103: >
01810574 AIX-17-047781; EDB-86-134443
Author(s): Loon, A.J. van; Smit, J.; Bueno de Mesquita, K.G. (eds.)
Title: Radioactive waste in the Netherlands. State of the art and future developments. 2. ed.
Original Title: Radioactief afval in Nederland. Stand van zaken en toekomstige ontwikkelingen
Corporate Source: Koninklijk Inst. van Ingenieurs, The Hague (Netherlands) Netherlands Energy Research Foundation, Petten
Conference Title: Radioactive waste in the Netherlands
Conference Location: Hague, Netherlands Conference Date: 24 Oct 1984
Publisher: Koninklijk Inst. van Ingenieurs,Hague, Netherlands
Publication Date: 1984 p 86
Report Number(s): CONF-8410363-
Document Type: Book; Conference literature
Language: Dutch
Journal Announcement: EDB8607
Availability: Library, KNAW, Kloveniersburgwal 29, 1011 JV Amsterdam (NL).
Subfile: INIS (non-US Atomindex input AIX)
Country of Origin: Netherlands
Country of Publication: Netherlands
Abstract: This book is a revision of ten contributions of various authors at a symposium on radioactive waste in the Netherlands. In ten chapters, some aspects of the problem are considered, namely: classification of radioactive wastes; governmental policy; central organization in waste treatment; interim-storage facilities; deep underground storage; in-situ experiments in salt deposits; treatment of radioactive wastes at the Dodewaard and Borssele reactors. 38 figs.; 8 tabs.
Major descriptors: *netherlands -- radioactive waste processing; *netherlands -- radioactive waste storage; *netherlands -- radioactive wastes; *radioactive wastes -- classification; *radioactive wastes -- government policies
Descriptors: borssele reactor; dodewaard reactor; salt caverns
Broader Terms: BWR type reactors; cavities; enriched uranium reactors; europe; management; materials; power reactors; processing; pwr type reactors; radioactive materials; reactors; storage; thermal reactors; waste management; waste processing; waste storage; wastes; water cooled reactors; water moderated reactors; western europe
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal

Citation 161

<DIALOG File 103: >

01791579 INS-86-020087; ERA-11-037555; EPA-12-003112; EDB-86-115297
Title: Threshold guidance update
Author(s): Wickham, L.E.
Affiliation: EG and G Idaho, Inc., Idaho Falls
Title: Proceedings of the seventh annual participants information meeting. DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 7. annual DOE LLWMP participants information meeting
Conference Location: Las Vegas, NV, USA Conference Date: 10 Sep 1985
Publication Date: Feb 1986 p 334-341
Report Number(s): CONF-8509121-
Order Number: DE86010152
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8607
Availability: NTIS, PC A99/MF A01; 1.
Subfile: EPA (Energy Abstracts for Policy Analysis); ERA (Energy Research Abstracts); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Department of Energy (DOE) is developing the concept of threshold quantities for use in determining which waste materials must be handled as radioactive waste and which may be disposed of as nonradioactive waste at its sites. Waste above this concentration level would be managed as radioactive or mixed waste (if hazardous chemicals are present); waste below this level would be handled as sanitary waste. Last years' activities (1984) included the development of a threshold guidance dose, the development of threshold concentrations corresponding to the guidance dose, the development of supporting documentation, review by a technical peer review committee, and review by the DOE community. As a result of the comments, areas have been identified for more extensive analysis, including an alternative basis for selection of the guidance dose and the development of quality assurance guidelines. Development of quality assurance guidelines will provide a reasonable basis for determining that a given waste stream qualifies as a threshold waste stream and can then be the basis for a more extensive cost-benefit analysis. The threshold guidance and supporting documentation will be revised, based on the comments received. The revised documents will be provided to DOE by early November. DOE-HQ has indicated that the revised documents will be available for review by DOE field offices and their contractors.
Major descriptors: *radioactive wastes -- threshold dose; *wastes -- classification
Descriptors: cost benefit analysis; quality assurance; radioactive waste disposal; recommendations; US DOE
Broader Terms: doses; management; materials; national organizations; radiation doses; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
290300 -- Energy Planning & Policy -- Environment, Health, & Safety
INIS Subject Categories: E5200* -- Waste Disposal

Citation 162

<DIALOG File 103: >
01783425 DEN-86-003805; ERA-11-033786; EDB-86-107140
Title: 'Waste' instrument for classifying of Pu-contaminated wastes based on passive neutron assay
Author(s): Bondar, L.; Girardi, F.; Merz, E.; Odoj, R.; Warnecke, E. (eds.)
Affiliation: Commission of the European Communities, Ispra, Italy. Joint Research Centre
Title: Radioactive waste products - suitability for final disposal. Proceedings
Corporate Source: Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie der Nuklearen Entsorgung Physikalisch-Technische Bundesanstalt, Braunschweig (Germany, F.R.) Commission of the European Communities, Ispra (Italy). Joint Research Centre
Conference Title: International seminar on radioactive waste products suitability for final disposal

Conference Location: Julich, F.R. Germany Conference Date: 10 Jun 1985
Publication Date: Jun 1985 p 133-139
Report Number(s): Juel-Conf-54; CONF-8506114-
Order Number: DE86752037
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8605
Availability: NTIS (US Sales Only), PC A99/MF A01.
Subfile: ERA (Energy Research Abstracts). DEN (Federal Republic of Germany (sent to DOE from))
Country of Origin: Commission of the European Communities <CEC>
Country of Publication: Germany, Federal Republic of
Abstract: The construction of a 'waste' instrument is in course. It is able to assign waste drums to one of three possible routes; shallow land burial, deep repository, intermediate storage for future recycle. Preliminary experiments have been carried out to clarify construction parameters. The results for the 220 l concrete drum indicate the realizability of the 'waste' instrument.
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- quality control
Descriptors: casks; cements; contamination; he-3 counters; neutron detection; neutron emission; plutonium 240; pulsed neutron techniques; radioactive waste disposal; radioassay; safeguards
Broader Terms: actinide isotopes; actinide nuclei; alpha decay radioisotopes; building materials; containers; control; detection; emission; even-even nuclei; heavy nuclei; isotopes; management; materials; measuring instruments; neutron detectors; nuclei; plutonium isotopes; proportional counters; radiation detection; radiation detectors; radioactive materials; radioactive wastes; radioisotopes; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects

Citation 163

<DIALOG File 103: >
01783362 DEN-86-003812; ERA-11-033792; EDB-86-107077
Title: Characterization of low- and intermediate-level CANDU reactor wastes for disposal
Author(s): Williamson, A.S.; Merz, E.; Odoj, R.; Warnecke, E. (eds.)
Affiliation: Ontario Hydro, Toronto, Canada. Research Div.
Title: Radioactive waste products - suitability for final disposal. Proceedings
Corporate Source: Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie der Nuklearen Entsorgung Physikalisch-Technische Bundesanstalt, Braunschweig (Germany, F.R.)
Conference Title: International seminar on radioactive waste products suitability for final disposal
Conference Location: Julich, F.R. Germany Conference Date: 10 Jun 1985
Publication Date: Jun 1985 p 226-239
Report Number(s): Juel-Conf-54; CONF-8506114-
Order Number: DE86752037
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8605
Availability: NTIS (US Sales Only), PC A99/MF A01.
Subfile: ERA (Energy Research Abstracts). DEN (Federal Republic of Germany (sent to DOE from))
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: Low- and intermediate-level CANDU reactor radwastes are being characterized for composition, radiological hazard and conditioning requirements to enable eventual disposal of the wastes in rock caverns or in-ground concrete monoliths. The four main waste classifications are: combustible, compactable, non-processable and ion exchange resin. Studies have determined the radioactivity of incinerable and compactable waste is low and the activity of these wastes decreases considerably within ten years of production. Research is continuing on the

characterization of non-processable and ion exchange resin wastes. It is expected suitable packaging is all that will be required for non-processable waste and only ion exchange resins will require sophisticated conditioning treatment because of their relatively high carbon-14 loading.
Major descriptors: *candu type reactors -- intermediate-level radioactive wastes; *candu type reactors -- low-level radioactive wastes; *intermediate-level radioactive wastes -- chemical composition; *low-level radioactive wastes -- chemical composition
Descriptors: classification; combustion properties; radioactive waste disposal; radioactive waste facilities; radioactivity; rock caverns
Broader Terms: cavities; heavy water moderated reactors; management; materials; nuclear facilities; pressure tube reactors; radioactive materials; radioactive wastes; reactors; thermal reactors; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
210400 -- Power Reactors, Nonbreeding, Otherwise Moderated or Unmoderated

Citation 164

<DIALOG File 103: >
01776565 EDB-86-100278
Author(s): Elder, H.K.
Title: Technology, safety and costs of decommissioning reference nuclear fuel cycle facilities
Corporate Source: Pacific Northwest Lab., Richland, WA (USA)
Publication Date: May 1986 p 32
Report Number(s): NUREG/CR-4519; PNL-5586
Order Number: TI86011208
Contract Number (DOE): AC06-76RL01830
Document Type: Report
Language: English
Journal Announcement: ERA8606
Availability: NTIS, PC A03/MF A01 - GPO.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: The radioactive wastes expected to result from decommissioning nuclear fuel cycle facilities are reviewed and classified in accordance with 10 CFR 61. Most of the wastes from the MOX plant (exclusive of the lagoon wastes) will require interim storage (11% Class A 49 m/sup 3/; 89% interim storage, 383 m/sup 3/). The MOX plant lagoon wastes are Class A waste (2930 m/sup 3/). All of the wastes from the U-Fab and UF/sub 6/ plants are designated as Class A waste (U-Fab 1090 m/sup 3/, UF/sub 6/ 1259 m/sup 3/).
Major descriptors: *decommissioning -- radioactive wastes; *radioactive wastes -- classification
Descriptors: cost; feed materials plants; fuel cycle; fuel fabrication plants; mixed oxide fuel fabrication plants; safety; uranium
Broader Terms: actinides; elements; fuel fabrication plants; industrial plants; materials; metals; nuclear facilities; radioactive materials; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5100* -- Waste Treatment

Citation 165

<DIALOG File 103: >
01762033 EDB-86-085733
Title: Economic impact of 10CFR61 a utility point of view
Author(s): Tarnuzzer, E.C.
Affiliation: Yankee Atomic Electric Company, Framingham, MA
Title: Waste isolation in the U.S., technical programs and public education. Vol. 2

Conference Title: Waste management '84
Conference Location: Tucson, AZ, USA Conference Date: 11 Mar 1984
Publisher: American Nuclear Society,La Grange Park, IL
Publication Date: 1984 p 597-600
Report Number(s): CONF-840307-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8604
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: No one who is generating radioactive waste needs to be told what has happened to disposal costs over the past five years. The implementation of 10CFR61 has given disposal site operators another reason to increase site-related disposal costs. This, however, is only a part of our increased cost and not the part for discussion now. The real impact to utilities of Part 61 comes in the reporting and documentation requirements of waste classification and waste form. Part 61 requires the reporting of the concentrations of certain isotopes. Some industries that utilize only a known number of isotopes can state with certainty those isotopes not present and usually know, within a reasonable range, the concentrations of others to be expected in their waste streams. Reactor operations, on the other hand, produces a broad spectrum of fission and activation product whose distribution and concentration may vary with time within a reactor system. The fact that nearly all of the isotopes listed in Part 61 might (or could) be present in reactor wastes means that measurements must be made for them down to the physical lower limits of detection. The problem is compounded when one must measure low concentrations of low energy beta and alpha emitters in the presence of higher concentrations of gamma emitters. Part 61 mandates a waste classification system based upon isotopic concentrations. Wastes exceeding the limits for Class A have additional requirements on waste form that must be documented. The paper discusses actual cost associated with implementation of a Part 61 program, as well as annual costs for program maintenance. In addition, a range of costs is discussed that should define the limits of an acceptable program.
Major descriptors: *radioactive waste disposal -- cost; *radioactive waste disposal -- regulations; *radioactive waste disposal -- reporting requirements; *radioactive wastes -- classification; *radioactive wastes -- reporting requirements; *radioactive wastes -- underground disposal
Descriptors: documentation; economic impact; electric utilities; implementation; isotope ratio; power reactors; radiation monitoring; radioactivity; waste forms
Broader Terms: management; materials; monitoring; public utilities; radioactive materials; reactors; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 166

<DIALOG File 103: >
01753603 INS-86-012575; EDB-86-077294
Title: Study of sampling locations for classification of LWR process wastes
Author(s): Feizollani, F.; Dickey, R.L.
Affiliation: Bechtel National, Inc., San Francisco, CA
Title: Waste isolation in the U.S., technical programs and public education. Vol. 2
Conference Title: Waste management '84
Conference Location: Tucson, AZ, USA Conference Date: 11 Mar 1984
Publisher: American Nuclear Society,La Grange Park, IL
Publication Date: 1984 p 607-614
Report Number(s): CONF-840307-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8604

Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: A study was performed to identify the considerations arising in the selection of waste sampling locations for LWR process waste streams. The selection of sampling locations, either at points prior to treatment or at the points prior to packaging for off-site shipment, was assessed with respect to how reasonable and accurate these locations would be in determining waste classification. This waste classification is directed at implementing the recent 10CFR61 regulations pertaining to waste destined for near-surface land disposal.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- underground disposal; *radioactive waste disposal -- regulations; *radioactive waste disposal -- site selection; *water cooled reactors -- low-level radioactive wastes
Descriptors: implementation; radiation monitoring; sampling
Broader Terms: management; materials; monitoring; radioactive materials; radioactive wastes; reactors; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 167

<DIALOG File 103: >
01753595 INS-86-012567; EDB-86-077286
Title: Waste characterization studies at CRNL
Author(s): Csullog, G.W.; Kupca, S.
Affiliation: Atomic Energy of Canada Limited, Chalk River Nuclear Laboratories, Chalk River, Ontario
Title: Waste isolation in the U.S., technical programs and public education. Vol. 2
Conference Title: Waste management '84
Conference Location: Tucson, AZ, USA Conference Date: 11 Mar 1984
Publisher: American Nuclear Society, La Grange Park, IL
Publication Date: 1984 p 197-204
Report Number(s): CONF-840307-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8604
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: Canada
Country of Publication: United States
Abstract: The strategy of the radioactive Waste Disposal Project at the Chalk River Nuclear Laboratories (CRNL) is to classify waste segments according to potentially hazardous lifetimes and to match these segment to disposal options selected for their abilities to isolate and contain these wastes. In support of this strategy the principal objective of the waste characterization program is to estimate the quantity and radiological characteristics of the CRNL wastes that will require disposal. The initial focus of the characterization program is the development of a practical, cost-effective waste assay system to estimate the radiological properties of solid wastes handled by the Waste Treatment Centre (WTC) where most of the volume of current solid wastes will be processed. The proposed system will characterize these wastes in a high-throughput, production environment, provide data in support of WTC process operation and maintain electronic data files for waste management purposes. This report summarizes the preliminary research effort to develop the assay system. Studies include the characterization of WTC incinerator ash and the nondestructive gamma-ray monitoring of the incinerator feed using sodium iodide and intrinsic germanium detectors. Additionally, specifications are given for demonstration, nondestructive, solid waste monitor for use at the WTC.
Major descriptors: *radiation monitors -- demonstration programs; *radioactive wastes -- classification; *radioactive wastes -- radioassay
Descriptors: chalk river nuclear labs; data base management; semiconductor detectors; nai detectors; nondestructive testing; on-line measurement systems; radiation monitoring; radioactive waste disposal; radioactive waste facilities;

solid wastes
Broader Terms: atomic energy of canada ltd; canadian organizations; management; materials; materials testing; measuring instruments; monitoring; monitors; national organizations; nuclear facilities; on-line systems; radiation detectors; radioactive materials; scintillation counters; semiconductor detectors; solid scintillation detectors; testing; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 168

<DIALOG File 103: >
01740632 INS-86-009264; EDB-86-064319
Title: Calculating the chemical hazard of radioactive waste
Author(s): Wickham, L.E.
Affiliation: EGandG Idaho, Inc., Idaho Falls, ID
Title: Waste isolation in the U.S., technical programs and public education
Conference Title: Waste management '84
Conference Location: Tucson, AZ, USA Conference Date: 11 Mar 1984
Publisher: American Nuclear Society,La Grange Park, IL v 1.
Publication Date: Mar 1984 p 655-660
Report Number(s): CONF-840307-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8603
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: Low-level radioactive wastes contain a wide variety of substances that are both radioactive and chemically hazardous. While the radioactive characteristics of these wastes have been defined, chemical components have been ignored from a management and regulatory point of view. In this paper, a methodology for comparing the hazards of various chemicals quantitatively with those of radioactive materials is presented in the form of a Waste Classification System. The system considers the hazards of materials based on intrinsic toxicity, persistence through time, availability to a human receptor, and buildup of decay or degradation products. The system has been applied to a number of materials to show its versatility. Examples are provided.
Major descriptors: *chemical wastes -- classification; *chemical wastes -- health hazards; *chemical wastes -- risk assessment; *low-level radioactive wastes -- chemical wastes
Descriptors: biological accumulation; hazardous materials; human populations; radioactive waste management; toxicity
Broader Terms: hazards; management; materials; populations; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 400702* -- Radiochemistry & Nuclear Chemistry -- Properties of Radioactive Materials
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: B1320* -- Properties of radioactive materials
E5000 -- Waste Management

Citation 169

<DIALOG File 103: >
01740631 INS-86-009263; EDB-86-064318
Title: 61TRAK - An isotope behavior analysis program
Author(s): Vance, J.N.; Herrin, J.S.; Hope, R.T.
Affiliation: Impell Corporation, Technology Park/Atlanta, Norcross, GA

Title: Waste isolation in the U.S., technical programs and public education
Conference Title: Waste management '84
Conference Location: Tucson, AZ, USA Conference Date: 11 Mar 1984
Publisher: American Nuclear Society, La Grange Park, IL v 1.
Publication Date: Mar 1984 p 651-654
Report Number(s): CONF-840307-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8603
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: 61TRAK is an isotope behavior analysis computer program designed to comply with Title 10, Part 61 of the Code of Federal Registration. As part of the rule, radioactive waste must be classified based, in part, on concentrations of alpha and beta emitting radionuclides. These radionuclides are not routinely measured at most nuclear plants. 61TRAK was developed to derive scaling factors between gamma emitting (easy-to-measure) isotopes and non-gamma emitting (difficult-to-measure) isotopes. These scaling factors can be used directly with certain easy-to-measure isotopes to arrive at concentrations of the difficult-to-measure isotopes. In addition, 61TRAK monitors changing plant condition indicators to determine when reanalysis of the difficult-tomeasure isotopes may be required.
major descriptors: *computer codes -- number codes; *power reactors -- radiation monitoring; *radioactive wastes -- classification
Descriptors: alpha decay radioisotopes; alpha particles; beta decay radioisotopes; beta particles; computer calculations; gamma radiation; isotope ratio; standards
Broader Terms: charged particles; computer codes; electromagnetic radiation; ionizing radiations; isotopes; materials; monitoring; radiations; radioactive materials; radioisotopes; reactors; wastes
Subject Categories: 400702* -- Radiochemistry & Nuclear Chemistry -- Properties of Radioactive Materials
INIS Subject Categories: B1320* -- Properties of radioactive materials

Citation 170

<DIALOG File 103: >
01736406 EDB-86-060088
Author(s): Bowerman, B.S.; Davis, R.E.; Siskind, D.B.
Title: Document review regarding hazardous chemical characteristics of low-level waste
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Publication Date: Mar 1986 p 96
Report Number(s): NUREG/CR-4433; BNL-NUREG-51936
Order Number: TI86008306
Contract Number (DOE): AC02-76CH00016
Document Type: Report
Language: English
Journal Announcement: ERA8604
Availability: NTIS, PC A05/MF A01 - GPO.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). TIC (Technical Information Center)
Country of Origin: United States
Country of Publication: United States
Abstract: A review of commercial disposal site records and literature sources was conducted in order to determine whether low-level radioactive wastes (LLW) could be classified as hazardous under the definitions of 40 CFR Part 261. Two types of LLW from both fuel-cycle and non-fuel-cycle sources were identified as potential concerns: spent organic solvents and lead metal. The first category includes liquid scintillation wastes, while lead metal wastes may include discarded shielding and containers. Additional LLW categories may contain hazardous constituents listed in Appendix VIII of 40 CFR Part 261. The information reviewed was not sufficient to make a firm judgment as to

whether any LLW as shipped for disposal would be hazardous under 40 CFR Part 261. 39 refs.
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: hazardous materials; lead; organic solvents; scrap metals
Broader Terms: elements; materials; metals; radioactive materials; radioactive wastes; scrap; solid wastes; solvents; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 171

<DIALOG File 103: >
01725597 INS-86-007206; EDB-86-049271
Title: Technical positions implementing 10 CFR Part 61
Author(s): Hawkins, E.F.; Siefken, D.L.; Post, R.G.; Wacks, M.E.; McComb, D.
Affiliation: US Nuclear Regulatory Commission
Title: Waste isolation in the US and elsewhere, technical programs and public communications. Vol. 2. Low-level waste
Conference Title: Waste management conference (ANS)
Conference Location: Tucson, AZ, USA Conference Date: 8 Mar 1982
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1982 p 99-109
Report Number(s): CONF-820303-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8602
Subfile: INS (US Atomindex input). NOV (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The Low-Level Waste Licensing Branch of the Nuclear Regulatory Commission is developing a series of technical positions implementing the proposed 10 CFR Part 61. These technical papers will cover the following subjects related to near-surface disposal facilities: site selection, suitability and characterization; facility design and operations; waste form; waste classification; site and personnel monitoring; site closure, stabilization, and post-operational surveillance; and funding assurances for closure and long-term custodial care. Additional technical positions, such as site performance modeling, are under consideration. In addition, the Office of Nuclear Regulatory Research is preparing Standard Format and Content Guides for License Applications and Environmental Reports.
Major descriptors: *radioactive waste disposal -- regulations; *radioactive waste disposal -- site selection; *radioactive waste facilities -- design; *radioactive waste facilities -- operation
Descriptors: classification; license applications; licensing; low-level radioactive wastes; personnel monitoring; stabilization; surveillance; US NRC; waste forms
Broader Terms: administrative procedures; management; materials; monitoring; national organizations; nuclear facilities; radiation monitoring; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 172

<DIALOG File 103: >
01725567 INS-86-007177; EDB-86-049241
Title: Overall effects of the reclassification of low specific activity radioactive materials
Author(s): Mallory, Ch.W.; Post, R.G. (ed.)
Affiliation: Hittman Nuclear and Development Corporation, A Westinghouse Electric Corporation Subsidiary, Columbia, Maryland

Title: Waste management '83. Vol. 1
Conference Title: Waste management conference
Conference Location: Tucson, AZ, USA Conference Date: 27 Feb 1983
Publisher: American Nuclear Society,La Grange Park, IL
Publication Date: 1983 p 405-410
Report Number(s): CONF-830205-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8603
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: The International Atomic Energy Agency and the Nuclear Regulatory Commission are proposing changes in the classification of low specific activity materials. The proposed changes would limit the external radiation from unshielded packages to either 0.5 or 1.0 Rem per hour at three meters depending upon the type of material. The specific activity of the material that can be transported as L.S.A. is reduced significantly from the previous limits which were based on inhalation and ingestion. A technique for estimating the surface radiation levels of unshielded packages is presented. This technique is also used to assure compliance with the proposed regulations. Increased Type B cask shipments will result from these regulations and less emphasis may be placed on volume reduction.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- release limits
Descriptors: activity levels; casks; iaea; radiation protection; radioactive waste disposal; regulations; us nrc; waste transportation
Broader Terms: containers; international organizations; management; materials; national organizations; radioactive materials; radioactive wastes; transport; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 173

<DIALOG File 103: >
01725566 INS-86-007176; EDB-86-049240
Title: Implementation of 10 CFR part 61 waste classification and waste form requirements
Author(s): Johnson, T.C.; Lohaus, P.H.; Roles, G.W.; Post, R.G. (ed.)
Affiliation: U.S. Nuclear Regulatory Commission, Washington, DC
Title: Waste management '83. Vol. 1
Conference Title: Waste management conference
Conference Location: Tucson, AZ, USA Conference Date: 27 Feb 1983
Publisher: American Nuclear Society,La Grange Park, IL
Publication Date: 1983 p 401-403
Report Number(s): CONF-830205-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ERA8603
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: Two important areas in the United States Nuclear Regulatory Commission regulation for low-level waste management, 10 CFR Part 61, involve the requirements for waste classification and waste form. The waste classification system establishes three categories of wastes acceptable for near-surface disposal. These categories are determined by the concentrations of nuclides important for disposal. Class A wastes have low concentrations and need only meet minimum waste form requirements. Class B wastes have higher concentrations and are required to have stability to minimize disposal trench subsidence effects. Class C wastes have higher concentrations than do Class B wastes and are required to have stability and be disposed of with a intruder barrier. An intruder barrier is

intended to minimize the contact of wastes by inadvertent intruder following the loss of disposal site institutional control. Many of the nuclides listed in the waste classification system are difficult to assay. Consequently, a waste generator is allowed to establish an analytic program which utilizes inferential measurement to classify wastes. This paper discusses the guidance provided to waste generators which can be used to establish assay programs for classifying wastes. Class B and C wastes are required to meet 10 CFR Part 61 stability requirements. This paper also discusses the approaches used to demonstrate that such wastes meet the stability criteria, including acceptable tests and test criteria which could be used by waste generators to demonstrate waste stability.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- underground disposal; *underground disposal-- regulations
Descriptors: radioactive waste disposal; radioactive waste management; US NRC; waste forms
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E5200* -- Waste Disposal
F4200 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 174

<DIALOG File 103: >
01725436 EDB-86-049110
Title: The impact of 10 CFR 61 on utility radioactive waste operations
Author(s): Voit, R.E.; Motl, G.P.; Post, R.G. (ed.)
Affiliation: NUS Process Services Corporation, Columbia, SC
Title: Waste management '83. Vol. 1
Conference Title: Waste management conference
Conference Location: Tucson, AZ, USA Conference Date: 27 Feb 1983
Publisher: American Nuclear Society,La Grange Park, IL
Publication Date: 1983 p 411-414
Report Number(s): CONF-830205-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: INS8603
Subfile: INS (US Atomindex input). IFI (Claims/U.S. Patent Abstracts)
Country of Origin: United States
Country of Publication: United States
Abstract: Over the past five years, the Nuclear Regulatory Commission (NRC) has been developing regulations to govern the siting, operation, close out, and long-term control of low-level radioactive waste disposal sites. During this period, the NRC published a regulation advance notice, a preliminary draft, a proposed version, and a draft environmental impact statement. Four regional workshops were also sponsored by the NRC to provide the opportunity to discuss the regulations with various industry representatives. The resulting regulation, Title 10 to the Code of Federal Regulations Part 61 (10 CFR 61) ''Licensing Requirements For Land Disposal of Radioactive Waste,'' was finally issued in November, 1982. Although 10 CFR 61 applies primarily to the operator of waste disposal sites, it also has significant impact on the waste generator. This paper analyzes the impact on waste generator operations in the following five areas: waste classification; waste packaging and shipping; package labeling; operating costs; and waste volume reduction programs.
Major descriptors: *low-level radioactive wastes -- radioactive waste disposal; *low-level radioactive wastes -- radioactive waste processing; *low-level radioactive wastes -- underground disposal; *nuc lear power plants -- radioactive waste management; *radioactive waste disposal -- regulations; *underground disposal -- regulations
Descriptors: classification; environmental impacts; minimization; operating cost; US NRC; waste transportation
Broader Terms: cost; management; materials; national organizations; nuclear facilities; power plants; processing; radioactive materials; radioactive wastes; thermal power plants; transport; waste disposal; waste management; waste

processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment
E5200 -- Waste Disposal

Citation 175

<DIALOG File 103: >
01725348 INS-86-007073; EDB-86-049022
Title: Classification of TMI wastes
Author(s): Johnson, T.C.; Post, R.G.; Wacks, M.E.; McComb, D.
Title: Waste isolation in the US and elsewhere, technical programs and public communications. Vol. 2. Low-level waste
Conference Title: Waste management conference (ANS)
Conference Location: Tucson, AZ, USA Conference Date: 8 Mar 1982
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1982 p 121-131
Report Number(s): CONF-820303-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: ERA8602
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input). NOV(DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: The cleanup of TMI-2 will produce a wide variety of waste types. Based on the proposed 10 CFR 61 waste classification system these wastes will primary fall in Classes A, B, and C. However, a limited quantity of the wastes will exceed the Class C limits. DOE has agreed to accept the high activity and unusual wastes for research and development studies and disposal.
Major descriptors: *radioactive wastes -- classification; *three mile island-2 reactor -- radioactive wastes
Descriptors: radioactive waste disposal; regulations; research programs; us doe
Broader Terms: enriched uranium reactors; management; materials; national organizations; power reactors; PWR type reactors; radioactive materials; reactors; thermal reactors; waste disposal; waste management; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
INIS Subject Categories: E5000* -- Waste Management
E3200 -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)

Citation 176

<DIALOG File 103: >
01696560 INS-86-001905; ERA-11-008398; EDB-86-015118
Title: Disposal of slightly contaminated waste oil
Author(s): Stanford, R.E.L.
Affiliation: Utility Nuclear Waste Management Group, Washington, DC
Title: Proceedings of the sixth annual Participants' Information Meeting DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 6. annual Low-Level Waste Management Program participants' information meeting
Conference Location: Denver, CO, USA Conference Date: 11 Sep 1984
Publication Date: Dec 1984 p 399-402

Report Number(s): CONF-8409115-
Order Number: DE85011095
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8601
Availability: NTIS, PC A99/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: Currently, the disposal of essentially all low-level waste is subject to the requirements of 10 CFR Part 61. This regulation requires, among other things, waste classification by radionuclide concentration, compliance with waste form, packaging and shipping manifest provisions and disposal facility requirements. Much of this waste, however - including quantities of waste lubricating oil from nuclear power plants - contains radionuclide concentrations so low that disposal by less restrictive methods would pose an insignificant risk to the environment and public health and safety. Thus, expenditure of resources to ensure that Part 61 requirements are met with respect to this waste cannot be justified. Last month the Utility Nuclear Waste Management Group, in conjunction with the Edison Electric Institute, petitioned the Nuclear Regulatory Commission for the issuance of a regulation governing the disposal of low-level radioactively contaminated waste oil from nuclear power plants. Essentially, the petition requests that a regulation be issued setting forth radionuclide concentrations below regulatory concern (BRC) - such that waste oil with radionuclide concentrations less than said levels could be disposed of without regard to the radioactive material content of the waste. Adoption of such a rule would provide for the more efficient disposal of slightly contaminated waste oil while, at the same time, provide adequate protection for both the environment and public health and safety.
Major descriptors: *low-level radioactive wastes -- radioactive waste disposal; *nuclear power plants -- waste oils; *waste oils -- radioactive waste disposal
Descriptors: classification; radioecological concentration; regulations; safety
Broader Terms: ecological concentration; management; materials; nuclear facilities; oils; organic compounds; other organic compounds; power plants; radioactive materials; radioactive wastes; thermal power plants; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 177

<DIALOG File 103: >
01696559 INS-86-001904; ERA-11-008397; EDB-86-015117
Title: Classification of low-level radioactive wastes from nuclear power plants
Author(s): Stanford, R.E.L.
Affiliation: Utility Nuclear Waste Management Group, Washington, DC
Title: Proceedings of the sixth annual Participants' Information Meeting DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 6. annual Low-Level Waste Management Program participants' information meeting
Conference Location: Denver, CO, USA Conference Date: 11 Sep 1984
Publication Date: Dec 1984 p 389-398
Report Number(s): CONF-8409115-
Order Number: DE85011095
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8601
Availability: NTIS, PC A99/MF A01; 1.

Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The NRC regulation, 10 CFR Part 61, establishes three classes of wastes designated A, B, and C based on listed concentrations of specific nuclides. The NRC Branch Technical Position (BTP) relative to the required compliance program focused on extensive waste stream sampling and analysis as a means of compliance but did not preclude other approaches that could be shown to "ensure a realistic representation of the distribution of radionuclides within waste" and "to classify waste in a consistent manner." To meet the above regulatory requirements, an engineering analysis approach for quantifying the concentrations and amounts of radionuclides of classification concern was developed as an alternative to an extensive and difficult waste sampling and analysis program. Essentially this methodology involves a material balance of radionuclides which for the most part originate in the reactor core and are transported to the waste streams by reactor coolants and whose concentration in the coolant is primarily a function of fuel performance. The use of scaling factors between readily measured key radionuclides and others required for classification have been published in Report AIF/NESP-027 entitled "Methodologies for Classification of Low-Level Radioactive Wastes from Nuclear Power Plants". Since then data from about 1000 samples on nuclide concentrations in various reactor waste streams from 65 units at 40 sites was collated, analyzed and evaluated to confirm the calculational methodology in AIF/NESP-027. In summary, the approach and results of the engineering analysis methodology were validated.
major descriptors: *low-level radioactive wastes -- classification
Descriptors: nuclear power plants; radioecological concentration; radioisotopes; radionuclide migration; reactor cores; US NRC; water pollution
Broader Terms: ecological concentration; environmental transport; isotopes; mass transfer; materials; national organizations; nuclear facilities; pollution; power plants; radioactive materials; radioactive wastes; reactor components; thermal power plants; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
520301 -- Environment, Aquatic -- Radioactive Materials Monitoring & Transport -- Water -- (1987)
INIS Subject Categories: E5200* -- Waste Disposal
B3200 -- Water

Citation 178

<DIALOG File 103: >
01696499 INS-86-001869; ERA-11-008394; EDB-86-015057
Title: Waste classification: a management approach
Author(s): Wickham, L.E.
Title: Proceedings of the sixth annual Participants' Information Meeting DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 6. annual Low-Level Waste Management Program participants' information meeting
Conference Location: Denver, CO, USA Conference Date: 11 Sep 1984
Publication Date: Dec 1984 p 367-371
Report Number(s): CONF-8409115-
Order Number: DE85011095
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8601
Availability: NTIS, PC A99/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: A waste classification system designed to quantify the total hazard of a waste has been developed by the Low-Level Waste Management Program. As originally conceived, the system was designed to deal with mixed

radioactive waste. The methodology has been developed and successfully applied to radiological and chemical wastes, both individually and mixed together. Management options to help evaluate the financial and safety trade-offs between waste segregation, waste treatment, container types, and site factors are described. Using the system provides a very simple and cost effective way of making quick assessments of a site's capabilities to contain waste materials.
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: radioactive waste management
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 179

<DIALOG File 103: >
01688537 ERA-11-004617; EDB-85-187788
Title: Impact of long-lived radionuclides on waste classification for fusion
Author(s): Maninger, R.C.
Affiliation: Lawrence Livermore National Lab., Livermore, CA
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: Boston, MA, USA Conference Date: 9 Jun 1985
Source: Trans. Am. Nucl. Soc. (United States) v 49. Coden: TANSA
Publication Date: 1985 p 65-66
Report Number(s): CONF-850610-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: INS8511
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None
Major descriptors: *thermonuclear reactors -- radioactive waste disposal
Descriptors: classification; environmental impacts; feasibility studies; health hazards; low-level radioactive wastes; MARS reactor; radioisotopes
Broader Terms: hazards; isotopes; magnetic mirror type reactors; management; materials; radioactive materials; radioactive wastes; thermonuclear reactors; waste disposal; waste management; wastes
Subject Categories: 700206* -- Fusion Power Plant Technology -- Environmental Aspects
INIS Subject Categories: A1430* -- Fusion fuels

Citation 180

<DIALOG File 103: >
01576640 EDB-85-083418
Author(s): Brodzinski, R.L.; Perkins, R.W.; Rieck, H.G.; Wogman, N.A.
Title: Measurement of radionuclides in waste packages
Corporate Source: Pacific Northwest Labs., Richland, WA (USA)
Patent Assignee(s): Dept. of Energy
Application/Priority No.: US 6-649625
Publication Date: 12 Sep 1984 p 8
Order Number: DE85011674
Contract Number (DOE): AC06-76RL01830
Document Type: Patent

Language: English
Journal Announcement: ERA8506
Availability: NTIS, PC A02/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS).
Country of Origin: United States
Country of Publication: United States
Abstract: A method is described for non-destructively assaying the radionuclide content of solid waste in a sealed container by analysis of the waste's gamma-ray spectrum and neutron emissions. Some radionuclides are measured by characteristic photopeaks in the gamma-ray spectrum; transuranic nuclides are measured by neutron emission rate; other radionuclides are measured by correlation with those already measured.
Major descriptors: *low-level radioactive wastes -- classification; *transuranium elements -- nondestructive analysis
Descriptors: gamma spectroscopy; neutron emission; nuclear reaction analysis; solid wastes
Broader Terms: chemical analysis; elements; emission; materials; radioactive materials; radioactive wastes; spectroscopy; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
400103 -- Radiometric & Radiochemical Procedures -- (-1987)
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures

Citation 181

<DIALOG File 103: >
01576577 INS-85-012620; EDB-85-083355
Title: Status of 10 CFR Part 61 implementation
Author(s): Jackson, K.C.
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Sixth annual DOE LLWMP Participants' Information Meeting
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 6. annual Low-Level Waste Management Program participants' information meeting
Conference Location: Denver, CO, USA Conference Date: 11 Sep 1984
Publication Date: 1984 p 17
Report Number(s): CONF-8409115-Absts.
Order Number: DE84016490
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8505
Availability: NTIS, PC A05/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The waste generator requirements for compliance with 10 CFR Part 61 became effective on December 27, 1982. The following provisions were made applicable to persons generating low-level radioactive waste (LLW): (a) 10 CFR 20.311, transfer for disposal and manifests; (b) 10 CFR 61.55, waste classification; (c) 10 CFR 61.56, waste characteristics; (d) 10 CFR 61.57, labeling. 10 CFR 20.311 requirements provide for a manifest tracking system to supplement existing provisions for transfers and recordkeeping for waste shipments. The waste classification system permits three classes of waste to be routinely disposed of at LLW disposal sites, Class A, B, and C, requiring increasing levels of protection due to concentration and half life of radionuclides. A limited amount of waste (<1%) may exceed Class C concentration limits and must meet specific requirements for disposal at specific sites on a case-by-case basis. LLW must also meet certain characteristics requirements, depending on its class, in order to protect LLW disposal site personnel, to prevent slumping or collapse of the disposal unit and to protect the inadvertent intruder. The labeling requirement provides instructions to the disposal site operator regarding the classification of the waste package. This paper discusses Nuclear Regulatory Commission (NRC) initiatives toward implementing Part 61 and NRC/nuclear industry interactions directed toward full implementation.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste

disposal; *low-level radioactive wastes -- regulations
Descriptors: implementation; US NRC
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 182

<DIALOG File 103: >
01570968 ERA-10-025301; EDB-85-077745
Author(s): Cline, J.E.; Noyce, J.R.; Coe, L.J.; Wright, K.W.
Title: Assay of long-lived radionuclides in low-level wastes from power reactors
Corporate Source: Science Applications International Corp., Rockville, MD (USA)
Publication Date: Apr 1985 p 614
Report Number(s): NUREG/CR-4101
Order Number: TI85901372
Document Type: Report; Numerical data
Language: English
Journal Announcement: INS8503
Availability: NTIS, PC A99/MF A01 - GPO $11.00.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: The 10 CFR Part 61 waste classification system includes several nuclides which are difficult to assay without expensive radiochemical methods. In order for waste generators to classify wastes practically, NRC Staff has recommended the use of correlation factors to scale the difficult-to-measure nuclides with nuclides which can be measured more easily (i.e., gamma emitters such as /sup 60/Co or /sup 137/Cs). In this study, Science Applications International Corporation (SAIC) performed complete radiochemical assays for all the 10 CFR Part 61 waste classification nuclides on over 100 samples. These data, along with almost 800 other samples in the SAIC data base, were used to assess the validity of correlation factors suggested for use in nuclear power plant wastes. Specific generic correlation factors are recommended with other approaches to correlate nuclides for which generic scaling factors are not defensible. The primary nuclide correlations studied were /sup 14/C, /sup 55/Fe, /sup 59/Ni, /sup 63/Ni, and /sup 94/Nb, with /sup 60/Co; /sup 90/Sr, /sup 99/Tc, /sup 129/I, /sup 135/Cs, and /sup 239, 240/Pu with /sup 137/Cs; /sup 238/Pu, /sup 239, 240/Pu, /sup 241/Pu, /sup 241/Am, /sup 242/Cm, and /sup 243, 244/Cm with /sup 144/Ce; and /sup 238/Pu, /sup 241/Pu, /sup 241/Am, /sup 242/Cm and /sup 243, 244/Cm with /sup 239, 240/Pu.
Major descriptors: *americium 241 -- radiochemical analysis; *carbon 14 -- radiochemical analysis; *cesium 135 -- radiochemical analysis; *curium 242 -- radiochemical analysis; *curium 243 -- radiochemical analysis; * curium 244 -- radiochemical analysis; *iodine 129 -- radiochemical analysis; *iron 55 -- radiochemical analysis; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radiochemica l analysis; *nickel 59 -- radiochemical analysis; *nickel 63 -- radioch emical analysis; *niobium 94 -- radiochemical analysis; *nuclear power plants -- radioactive waste management; *nuclear power plants -- radioc hemical analysis; *plutonium 238 -- radiochemical analysis; *plutonium 238 -- radiochemical analysis; *plutonium 239 -- radiochemical analysis; *plutonium 240 -- radiochemical analysis; *plutonium 241 -- r adiochemical analysis; *strontium 90 -- radiochemical analysis; *techne tium 99 -- radiochemical analysis
Descriptors: correlations; corrosion products; data compilation; fission products
Broader Terms: actinide isotopes; actinide nuclei; alkali metal isotopes; alkaline earth isotopes; alpha decay radioisotopes; americium isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cesium isotopes; chemical analysis; curium isotopes; data; days living radioisotopes; electron capture radioisotopes; even-even nuclei; even-odd nuclei; heavy nuclei; hours living radioisotopes; info rmation; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; iron isotopes; isomeric transition isotopes; isotopes; light nuclei; management; materials; minutes living radioisotopes; nickel isotopes; niobium isotopes; nuclear facilities; nuclei;

numerical data; odd-even nuclei; odd-odd nuclei; plutonium isotopes; power plants; quantitative chemical analysis; radioactive materials; radioactive wastes; radioisotopes; strontium isotopes; technetium isotopes; the rmal power plants; waste management; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
400103 -- Radiometric & Radiochemical Procedures -- (-1987)
INIS Subject Categories: E5000* -- Waste Management
B1110 -- Nuclear methods in chemical & isotopic analysis

Citation 183

<DIALOG File 103: >
01564547 EDB-85-071322
Title: Significance of waste characterization for the EC programme on radioactive waste management
Author(s): Krischer, W.; Krischer, W.; Simon, R.
Affiliation: Commission of the European Comm.
Title: Testing, evaluation and shallow land burial of low and medium radioactive waste forms
Conference Title: Seminar on testing, evaluation and shallow land burial of low and medium radioactive waste forms
Conference Location: Geel, Belgium Conference Date: 28 Sep 1983
Publisher: Harwood Academic Publishers,Chur, Switzerland
Publication Date: 1984 p 1-6
Report Number(s): CONF-8309289-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8505
Country of Origin: Luxembourg
Country of Publication: Switzerland
Abstract: The seminar was convened to present first results of the Community programme on the characterization of low and medium active waste forms which is a joint effort of several laboratories of the EC Member States. The aims and the scope of the characterization programme as well as its integration in the overall EC waste management programme are reviewed in a brief summary. The study has two presentations on shallow land burial as being one of the final destinations for low active waste forms.
Major descriptors: *european communities -- radioactive waste management; * intermediate-level radioactive wastes -- classification; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- underground disposal
Descriptors: coordinated research programs
Broader Terms: international organizations; management; materials; radioactive materials; radioactive wastes; research programs; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 184

<DIALOG File 103: >
01564442 AIX-16-035304; EDB-85-071217
Title: Management of radioactive wastes
Author(s): Day, D.H.; Hughes, A.E.; Leake, J.W.; Marples, J.A.C.; Marsh, G.P.; Rae, J.; Wade, B.O. (UKAEA Atomic Energy Research Establishment, Harwell)
Source: Rep. Prog. Phys. (United Kingdom) v 48:1. Coden: RPPHA
Publication Date: Jan 1985 p 101-169
Document Type: Journal Article
Language: English
Journal Announcement: EDB8505
Country of Origin: United Kingdom

Abstract: The article describes sources of radioactive wastes, their origin and classification, the legislative background and how wastes are managed at present in the United Kingdom. The measurement of radioisotopes; the properties of vitrified waste; the corrosion of canisters; and the modelling of radionuclide movement in rock; are all discussed in detail. Future management of waste is considered, as well as the radiological impact of radioactive waste disposal.
Major descriptors: *radioactive waste management -- reviews; *radioactive wastes -- classification; *radioactive wastes -- origin; *united kingdom -- radioactive waste management
Descriptors: radioactive waste disposal; radioactive waste processing; radioactive waste storage
Broader Terms: document types; europe; management; materials; processing; radioactive materials; storage; waste disposal; waste management; waste processing; waste storage; wastes; western europe
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5100* -- Waste Treatment

Citation 185

<DIALOG File 103: >
01559891 EDB-85-066665
Author(s): Van Siclen, V.S.
Title: Radioactive waste examination pilot plant
Corporate Source: Idaho National Engineering Lab., Idaho Falls (USA)
Conference Title: Society of Women Engineers conference
Conference Location: Minneapolis, MN, USA Conference Date: 27 Jun 1985
Publication Date: 1985 p 4
Report Number(s): EGG-M-08785; CONF-8506107-1
Order Number: DE85009878
Contract Number (DOE): AC07-76ID01570
Note: Paper copy only, copy does not permit microfiche production
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA8505
Availability: NTIS, PC A02; 3.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The Stored Waste Examination Pilot Plant (SWEPP) is a contact-handled radioactive waste examination pilot facility at the Department of Energy's Idaho National Engineering Laboratory. The plant determines through computerized nondestructive examination (NDE) whether transuranic waste now stored at the INEL qualifies for shipment to DOE's Waste Isolation Pilot Plant in New Mexico or whether it needs further processing. As a container proceeds through the plant it is weighed, x-rayed with real-time radiography to determine actual contents, assayed to determine fissile contents, ultrasonically examined to determine container integrity, and surveyed for surface radiation and contamination. Because the facility handles transuranic waste, proper information management is essential. A microprocessor-based data management system has been developed for this purpose; a key feature is its direct communication with the computerized NDE equipment and with a mainframe computer on which the data is stored permanently. 4 references, 2 figures.;
Major descriptors: *alpha-bearing wastes -- certification; *alpha-bearing wastes -- classification; *idaho national engineering laboratory -- radioactive waste facilities
Descriptors: nondestructive analysis; pilot plants
Broader Terms: chemical analysis; functional models; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; US DOE; US ERDA; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5100* -- Waste Treatment

Citation 186

<DIALOG File 103: >
01556930 FRG-84-02824; EDB-85-063703
Title: Radioactive waste forms ready for ultimate storage
Author(s): Brennecke, P.; Ehrlich, D.; Illi, H.; Viehl, E.; Warnecke, E.
Original Title: Radioaktive Abfaelle endlagergerecht
Source: Energiewirtsch. Tagesfragen (Germany, Federal Republic of) v 34:10. Coden: EWTFA
Publication Date: Oct 1984 p 767-770
Document Type: Journal Article
Language: German
Journal Announcement: EDB8504
Country of Origin: Germany, Federal Republic of
Abstract: The Physikalisch-Technische Bundesanstalt in Braunschweig, FRG, has been given the task to study currently collected radioactive wastes and those expected in future for their suitability to be stored ultimately in abandoned shafts. These investigations are performed individually for various abandoned mines envisaged for this purpose, safety analyses being made for the different waste from and sites. The results yield information on the requirements to be met by the radioactive waste forms, and the requirements will be classified during the final phase of the project in a catalogue of requirements for ultimate storage of radioactive wastes.
Major descriptors: *federal republic of germany -- radioactive waste disposal; *radioactive waste disposal -- specifications; *radioactive wastes -- classification; *radioactive wastes -- specifications
Descriptors: abandoned shafts; data acquisition; planning; radioactive waste processing; salt deposits; underground disposal
Broader Terms: europe; geologic deposits; management; materials; mine shafts; processing; radioactive materials; shaft excavations; waste disposal; waste management; waste processing; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 187

<DIALOG File 103: >
01551023 ERA-10-017958; EDB-85-057796
Title: Segregation of transuranic waste at the Department of Energy's Rocky Flats Plant, Golden, Colorado
Corporate Source: USDOE Office of Inspector General, Albuquerque, NM. Western Regional Office
Publication Date: 6 Mar 1985 p 12
Report Number(s): DOE/IG-0216
Order Number: TI85008701
Note: Report to The Secretary
Document Type: Report
Language: English
Journal Announcement: ERA8504
Availability: OSTI
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); EPA (Energy Abstracts for Policy Analysis).
Country of Origin: United States
Country of Publication: United States
Abstract: An audit was made to determine whether reasonable steps were being taken to reduce quantities of TRU waste generated at the Rocky Flats Plant in Golden, Colorado. It covered the period January 1983 through September 1984. The scope of review consisted of: examining the pertinent TRU program documents and files; touring the Rocky Flats production facilities and observing the process of TRU waste generation; and interviewing TRU waste management officials at the Department's Headquarters in Germantown, Maryland; Albuquerque Operations Office, Albuquerque, New Mexico; and the Rocky Flats Area Office, Golden, Colorado. In addition, we also discussed the program activities with Rockwell International Corporation officials, who were the contractor operators of the Rocky Flats facility. It is recommended that appropriate steps be taken to study the various waste

streams at Rocky Flats to identify points along the streams where segregation may result in volume reduction of TRU Waste. The study should also determine the most cost effective method of making the procedural changes that would be required to effect such segregation.
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- minimization; *rocky flats plant -- alpha-bearing wastes
Descriptors: radioactive waste management
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; waste management; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
290600 -- Energy Planning & Policy -- Nuclear Energy
INIS Subject Categories: E5100* -- Waste Treatment
F1400 -- Social Impact of Nuclear Science & Technology

Citation 188

<DIALOG File 103: >
01537678 EDB-85-044449
Author(s): Hawley, K.A.; Napier, B.A.
Title: Ranking system for mixed radioactive and hazardous waste sites
Corporate Source: Pacific Northwest Labs., Richland, WA (USA)
Conference Title: 5. DOE environmental protection information meeting
Conference Location: Albuquerque, NM, USA Conference Date: 6 Nov 1984
Publication Date: Nov 1984 p 13
Report Number(s): PNL-SA-12489; CONF-841187-35
Order Number: DE85007506
Contract Number (DOE): AC06-76RL01830
Document Type: Report; Conference literature
Language: English
Journal Announcement: ERA8503
Availability: NTIS, PC A02/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The Environmental Protection Agency's Hazard Ranking System (HRS) is a simplified management decision tool that provides a common basis for evaluating a multitude of hazardous waste sites. A deficiency in the HRS for application to Department of Energy mixed radioactive and hazardous waste sites is its inability to explicitly handle radioactive material. A modification to the basic HRS to add the capability to consider radioactivity is described in this paper. The HRS considers the exposure routes of direct contact, fire/explosion, atmospheric release, surface-water release, and groundwater release. Each exposure route is further divided into release, route, containment, waste, and target characteristics. To maintain the basic HRS structure, only the waste characteristics section of each exposure route was modified. A ranking system was developed, using radiation dose pathway analysis, to group radionuclides by dose factors. For mixed waste sites, the ranking factor derived for radionuclides is compared with the ranking factor obtained for hazardous chemicals and the most restrictive is used in the overall ranking. The modified HRS has the advantages of being compatible with the original HRS, has reasonable information requirements, and provides scientifically defensible conclusions. 17 references.;
Major descriptors: *hazardous materials -- classification; *low-level radioactive wastes -- classification
Descriptors: mixtures; radioactive waste disposal
Broader Terms: dispersions; management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 189

<DIALOG File 103: >
01477021 AIX-15-064925; EDB-84-174829
Title: Fifth annual report made to the Secretary of State for the Environment, Secretary of State for Scotland, Secretary of State for Wales (Radioactive Waste Management Advisory Committee)
Publisher: HMSO,London, England
Publication Date: 1984 p 51
Document Type: Book
Language: English
Journal Announcement: EDB8410
Availability: HMSO, London, England, pound 3.00.
Country of Origin: United Kingdom
Country of Publication: United Kingdom
Abstract: The report is in chapters, entitled: the challenge of waste management (objectives of radioactive waste management; 'as low as reasonably achievable' (ALARA); disposal sites on land for low- and intermediate-level wastes; visit to French nuclear sites; disposal in boreholes on the continental shelf; sea disposal; conclusions); classification of solid wastes and current arisings (waste classification; high-level or heat-generating wastes; low-level wastes; intermediate-level wastes; waste inventory); liquid discharges from BNFL Sellafield (routine discharges; individual radiation exposures due to consumption of Irish Sea fish and shellfish, 1981; international reprocessing plants - scale of operation and liquid discharges to the environment; recommendations; incident leading to the contamination of beaches; techniques under development for the treatment of liquid effluents); future work (public consultation on assessment principles; research; expenditure on radioactive waste management research 1982/83 - 1984/85; Sellafield; fast reactor; long-term spent fuel element policy).;
Major descriptors: *radioactive waste management
Descriptors: ALARA; BNFL; classification; contamination; fuel reprocessing plants; inventories; irish sea; liquid wastes; public relations; radioactive waste disposal; radioactive waste processing; recommendations; research programs; shores; solid wastes; united kingdom
Broader Terms: atlantic ocean; europe; management; national organizations; nuclear facilities; processing; seas; surface waters; united kingdom organizations; waste disposal; waste management; waste processing; wastes; western europe
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5200* -- Waste Disposal

Citation 190

<DIALOG File 103: >
01458283 INS-84-020078; EDB-84-156088
Title: A technical approach for defining HLW
Author(s): Rundle, G.E.; Chu, M.S.; Felicetti, S.A.; Ortiz, N.R.
Affiliation: Sandia Nat'l Laboratories P.O. Box 5800 Albuquerque, NM 87185
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: New Orleans, LA, USA Conference Date: 3 Jun 1984
Source: Trans. Am. Nucl. Soc. (United States) v 46. Coden: TANSA
Publication Date: Jun 1984 p 162-163
Report Number(s): CONF-840614-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8409
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *high-level radioactive wastes -- classification

Descriptors: performance; radioactive waste disposal; regulations; underground disposal
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 191

<DIALOG File 103: >
01458276 INS-84-020071; EDB-84-156081
Title: Considerations in defining alpha-contaminated waste
Author(s): Smith, C.F.; Ciminesi, F.J.; Cohen, J.J.; Williams, W.J.
Affiliation: Science Applications, Inc. 1811 Santa Rita Road, Suite 104 Pleasanton, CA 94566
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: New Orleans, LA, USA Conference Date: 3 Jun 1984
Source: Trans. Am. Nucl. Soc. (United States) v 46. Coden: TANSA
Publication Date: Jun 1984 p 109-110
Report Number(s): CONF-840614-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8409
Subfile: INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *alpha-bearing wastes -- classification
Descriptors: radiation doses; radiation hazards; toxicity
Broader Terms: doses; hazards; health hazards; materials; radioactive materials; radioactive wastes; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 192

<DIALOG File 103: >
01458180 INS-84-020043; EDB-84-155985
Title: Dry active waste composition: The potential for volume reduction
Author(s): Daloisio, G.S.; Deltete, C.P.
Affiliation: Gilbert/Commonwealth Co. Gilbert Associates, Inc. P.O. Box 1498 Reading, PA 19603
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: New Orleans, LA, USA Conference Date: 3 Jun 1984
Source: Trans. Am. Nucl. Soc. (United States) v 46. Coden: TANSA
Publication Date: Jun 1984 p 164
Report Number(s): CONF-840614-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8409
Subfile: INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: compacting; optimization; volume
Broader Terms: materials; radioactive materials; radioactive wastes; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing

INIS Subject Categories: E5100* -- Waste Treatment

Citation 193

<DIALOG File 103: >
01458145 EDB-84-155950
Title: History and status of nondestructive assay systems at Los Alamos National Laboratory
Author(s): Koenig, R.A.; Caldwell, J.T.
Affiliation: Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545
Conference Title: Annual meeting of the American Nuclear Society
Conference Location: New Orleans, LA, USA Conference Date: 3 Jun 1984
Source: Trans. Am. Nucl. Soc. (United States) v 46. Coden: TANSA
Publication Date: Jun 1984 p 114-115
Report Number(s): CONF-840614-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8409
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *alpha-bearing wastes -- classification; *radioassay --measuring instruments
Descriptors: LASL; neutron detection; nondestructive analysis; spectroscopy
Broader Terms: chemical analysis; detection; materials; national organizations; radiation detection; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management 440100 -- Radiation Instrumentation
INIS Subject Categories: E5000* -- Waste Management
E4100 -- Particle & Radiation Detection & Measuring Instruments & Methods

Citation 194

<DIALOG File 103: >
01439729 EDB-84-137532
Author(s): Kempf, C.R.; Siskind, B.; Barletta, R.E.; Dougherty, D.R.
Title: Characterization of the radioactive waste packages of the Minnesota Mining and Manufacturing Company
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Publication Date: Jul 1984 p 84
Report Number(s): NUREG/CR-3844; BNL-NUREG-51787
Order Number: TI84015660
Contract Number (DOE): AC02-76CH00016
Document Type: Report
Language: English
Journal Announcement: ERA8409
Availability: NTIS, PC A05/MF A01 - GPO $4.50.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: An evaluation of the low-level waste packages generated by 3M was made on the basis of 10 CFR Part 61 criteria and on the Technical Position on Waste Form and Waste Classification (TP). 3M produces a variety of radioactive products and wastes. The dominant radioisotopes are Po-210 and Cs-137. The Po-210 packages are generally Class A and meet the requirements in 10 CFR Part 61. The Cs-137 and Sr-90 packages fall into all three waste classifications (A, B, and C). These wastes are packaged by 3M in 30-gallon or 55-gallon carbon steel drums (Class A) or 30-gallon lined drums (Class B and C). The Class B and greater lead- and concrete-lined packages have

been evaluated with respect to meeting the stability requirements for waste disposed of in a high integrity container. When so evaluated, eleven areas of concern were identified with respect to the requlations and recommendations in the TP.;
Major descriptors: *low-level radioactive wastes -- packaging
Descriptors: cesium 137; classification; containers; evaluation; polonium 210; strontium 90; US NRC
Broader Terms: alkali metal isotopes; alkaline earth isotopes; alpha decay radioisotopes; beta decay radioisotopes; beta-minus decay radioisotopes ; cesium isotopes; days living radioisotopes; even-even nuclei; heavy nuclei; intermediate mass nuclei; isotopes; materials; national organizations; nuclei; odd-even nuclei; polonium isotopes; radioactive materials; radioactive wastes; radioisotopes; strontium isotopes; wastes; years living radioisotopes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
070200 -- Radiation Sources
INIS Subject Categories: E5000* -- Waste Management
D1400 -- Isotopic Radiation Sources

Citation 195

<DIALOG File 103: >
01382969 INS-84-010527; ERA-09-025492; EDB-84-080766
Title: Isotopic analysis of radioactive waste packages (an inexpensive approach)
Author(s): Padula, D.A.; Richmond, J.S.
Affiliation: Kewaunee Nuclear Power Plant, WI
Title: PATRAM '83: 7th international symposium on packaging and transportation of radioactive materials. Proceedings. Volume 1
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 7. international symposium on packaging and transportation of radioactive materials
Conference Location: New Orleans, LA, USA Conference Date: 15 May 1983
Publication Date: Dec 1983 p 399-404
Report Number(s): CONF-830528-Vol.1
Order Number: TI84006239
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8405
Availability: NTIS, PC A99/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: A computer printout of the isotopic analysis for all radioactive waste packages containing resins, or other aqueous filter media is now required at the disposal sites at Barnwell, South Carolina, and Beatty, Nevada. Richland, Washington requires an isotopic analysis for all radioactive waste packages. The NRC (Nuclear Regulatory Commission), through 10 CFR 61, will require shippers of radioactive waste to classify and label for disposal all radioactive waste forms. These forms include resins, filters, sludges, and dry active waste (trash). The waste classification is to be based upon 10 CFR 61 (Section 1-7). The isotopes upon which waste classification is to be based are tabulated. 7 references, 8 tables.;
Major descriptors: *radioactive wastes -- classification
Descriptors: activity levels; containers; isotope ratio; packaging; solid wastes
Broader Terms: materials; radioactive materials; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 196

<DIALOG File 103: >
01376853 ERA-09-023024; EDB-84-074648
Author(s): Schultz, F.J.; Haff, K.W.; Coffey, D.E.; Norris, L.B.; Caldwell, J.T.; Close, D.A.; Kuckertz, T.H.; Kunz, W.E.; Pratt, J.C.
Title: First-year evaluation of a nondestructive assay system for the examination of ORNL TRU waste
Corporate Source: Oak Ridge National Lab., TN (USA)
Publication Date: Apr 1984 p 70
Report Number(s): ORNL-6007
Order Number: DE84010638
Contract Number (DOE): AC05-84OR21400
Document Type: Report; Numerical data
Language: English
Journal Announcement: INS8405
Availability: NTIS, PC A04/MF A01.
Subfile: INS (US Atomindex input); NTS (NTIS); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: The Oak Ridge National Laboratory has been selected as the demonstration site for a new transuranic neutron assay system (NAS) developed at the Los Alamos National Laboratory. In addition, in order to meet specific ORNL program objectives, an upgraded segmented gamma-ray drum scanner has been integrated into the nondestructive assay (NDA) system to serve as a radioisotope identifier and as a quantitative assay backup to the NAS. A verification study, wherein selected waste drums will be emptied into glove boxes and their contents sampled and subsequently gamma-ray assayed, will take place in FY 1984. Results will be compared to those obtained from the NDA techniques. The NAS uses pulsed-neutron interrogation (differential- dieaway technique) and passive neutron measurements to determine fissile component and an upper-limit estimate of the total TRU activity contained in each waste drum. Of the 171 waste drums assayed to date, nine drums were determined to contain less than 10 nCi/g TRU isotopes. An additional number of drums (approximately 20%) are expected to be categorized as non-TRU, which is presently defined as less than 100 nCi/g TRU concentration. This requires a detailed analysis of the data which includes waste matrix compensation, systematic qualitative and quantitative gamma-ray analyses, and interpretation of neutron multiplicity data. Reproducibility of the active assay measurements on a single waste drum indicate agreement to +-3% relative error. 14 references, 24 figures, 8 tables.;
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- gamma spectroscopy; *alpha-bearing wastes -- nuclear reaction analysis; *alpha-bearing wastes -- radiometric analysis; *ORNL -- radioactive waste storage; *radioactive waste storage -- alpha-bearing wastes
Descriptors: comparative evaluations; errors; experimental data; fissile materials; nondestructive analysis; reliability
Broader Terms: chemical analysis; data; fissionable materials; information; management; materials; national organizations; numerical data; quantitative chemical analysis; radioactive materials; radioactive wastes; spectroscopy; storage; US AEC; US DOE; US ERDA; waste management; waste storage; wastes
Subject Categories: 400101* -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
400103 -- Radiometric & Radiochemical Procedures -- (-1987)
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: B1110* -- Nuclear methods in chemical & isotopic analysis
E5200 -- Waste Disposal

Citation 197

<DIALOG File 103: >
01373902 ERA-09-022051; INS-84-009666; EDB-84-071697
Title: Meeting 10CFR61 radioisotopic identification requirements in the waste stream
Author(s): Mis, F.J.
Affiliation: Rochester Gas and Electric Corp., 89 East Avenue, Rochester, NY 14649
Conference Title: American Nuclear Society winter meeting
Conference Location: San Francisco, CA, USA Conference Date: 30 Oct 1983

Source: Trans. Am. Nucl. Soc. (United States) v 45. Coden: TANSA
Publication Date: Oct 1983 p 36-37
Report Number(s): CONF-831047-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8403
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- transport; *radioactive waste disposal -- regulations
Descriptors: computer codes; design; licensing; quantity ratio; site selection; US NRC
Broader Terms: management; materials; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 198

<DIALOG File 103: >
01356631 INS-84-006895; EDB-84-054311
Title: Investigations of potential below regulatory concern (de minimus) wastes
Author(s): Gruhlke, J.M.; Galpin, F.L.
Affiliation: Environmental Protection Agency, Washington, DC
Title: Proceedings of the Fifth Annual Participants' Information Meeting: DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 5. annual participants information meeting of DOE low level waste management program
Conference Location: Denver, CO, USA Conference Date: 30 Aug 1983
Publication Date: 1983 p 359-380
Report Number(s): CONF-8308106-
Order Number: DE84004134
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8404
Availability: NTIS, PC A99/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: Low-level radioactive waste (LLW) includes a wide variety of waste types. Many organizations are contemplating the merits of declaring certain LLW as de minimus. The concept of de minimus has considerable support, as evidenced by the comments on NRC's rulemaking for 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste. Practical and philosophical considerations lend weight to the further investigation of the de minimus concept for LLW. The Environmental Protection Agency (EPA) recognizes the interest and efforts in the concept of de minimus. Because the term de minimus may imply a lack of concern for the risks of disposal, we use the term Below Regulatory Concern (BRC). EPA has developed technical information, cost data, and a methodology for selecting promising candidate waste streams. The NRC's breakdown of LLW, as provided in the supporting documentation for 10 CFR Part 51, serves as a starting point for evaluating individual waste streams. Waste streams may then be ranked on the basis of individual dose, population health impact, and cost/benefit. A set of waste streams consistently ranks near the top in all categories and deserves further analysis. This screening is the initial step in an overall effort to develop a basis for determining the appropriateness and form of generic BRC criteria. 14 references, 8 tables.;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste management -- low-level

radioactive wastes
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 199

<DIALOG File 103: >
01356630 INS-84-006894; EDB-84-054310
Title: Waste classification system application
Author(s): Wickham, L.E.
Affiliation: EG and G Idaho Inc., Idaho Falls
Title: Proceedings of the Fifth Annual Participants' Information Meeting: DOE Low-Level Waste Management Program
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 5. annual participants information meeting of DOE low level waste management program
Conference Location: Denver, CO, USA Conference Date: 30 Aug 1983
Publication Date: 1983 p 338-348
Report Number(s): CONF-8308106-
Order Number: DE84004134
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: ERA8404
Availability: NTIS, PC A99/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The classification of materials based on total hazard could be a very useful measurement tool to aid in waste management decisions. This paper describes a waste classification system that evaluates the relative total hazard of chemical and radiological waste mixtures and provides guidance on the degree of isolation each waste type or shipment needs. The index considers the hazards of materials based on intrinsic toxicity, persistence through time, availability to a human receptor, and build up of decay products. The index has been applied to a number of materials to test its versatility and applicability. Examples are provided. 4 tables.;
Major descriptors: *hazardous materials -- classification; *hazardous materials -- waste management; *low-level radioactive wastes -- classification; *radioactive waste management -- low-level radioactive wastes
Descriptors: availability; hazards; toxicity
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: E5000* -- Waste Management
C5400 -- Radiation Protection Procedures

Citation 200

<DIALOG File 103: >
01351499 EDB-84-049178
Title: Evaluation of relative hazards of phosphate products and wastes (Phosphate ores)
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Publication Date: Mar 1984 p 42
Report Number(s): DOE/LLW-24T
Order Number: DE84007532
Contract Number (DOE): AC07-76ID01570

Document Type: Report; Numerical data
Language: English
Journal Announcement: ERA8404
Availability: NTIS, PC A03/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: Phosphate deposits throughout the world contain uranium and thorium series radionuclides, and stable metals, in concentrations greater than average natural background concentrations. The /sup 238/U series, including /sup 226/Ra and decay products, is the primary radiological concern. These nuclides are redistributed among the products, byproducts, and wastes from mining and processing of phosphate ore. Radium-226 is important not only as a gamma emitter that contributes to external radiation exposure, but also as a source of /sup 222/Rn and decay products. Radon decay products can accumulate in air inside structures built on reclaimed phosphate mining lands. In addition to potential radiation hazards, trace elements such as cadmium, lead, zinc, chromium, and vanadium are associated with phosphate ore and are found in some products and wastes. The natural uranium in phosphate ore is also chemically toxic. This report examines some of the exposure pathways for radiological and nonradiological hazards from the phosphate industry. A proposed waste classification methodology is applied to examine the hazardous potential of phosphate products, byproducts, and wastes. 33 references.;
Major descriptors: *fertilizers -- radioactivity; *ore processing -- radioactive wastes; *phosphate minerals -- mining; *phosphate minerals -- ore processing; *radium 226 -- radioecological concentration; *soils -- radionuclide migration; *thorium 230 -- radioecological concentration; *uranium 238 -- radioecological concentration; *uranium 238 -- radioecological concentration
Descriptors: by-products; cadmium; chromium; health hazards; lead; numerical data; radiation hazards; radon 222; vanadium; zinc
Broader Terms: actinide isotopes; actinide nuclei; alkaline earth isotopes; alpha decay radioisotopes; data; days living radioisotopes; ecological concentration; elements; environmental transport; even-even nuclei; hazards; health hazards; heavy nuclei; information; isotopes; mass transfer; materials; metals; minerals; nuclei; processing; radioactive materials; radioisotopes; radium isotopes; radon isotopes; thorium isotopes; transition elements; uranium isotopes; wastes; years living radioisotopes
Subject Categories: 053000* -- Nuclear Fuels -- Environmental Aspects
510301 -- Environment, Terrestrial -- Radioactive Materials Monitoring & Transport -- Soil -- (-1987)
054000 -- Nuclear Fuels -- Health & Safety
500300 -- Environment, Atmospheric -- Radioactive Materials Monitoring & Transport -- (-1989)
510200 -- Environment, Terrestrial -- Chemicals Monitoring & Transport -- (-1989)
INIS Subject Categories: C5220* -- Environmental aspects of radioactive effluent from existing nuclear installations
B3110 -- Radioactive materials monitoring & transport
C5400 -- Radiation Protection Procedures
B3310 -- Radioactive materials monitoring & transport; meteorology
C5230 -- Environmental aspects of chemical & thermal effluent from existing nuclear installations

Citation 201

<DIALOG File 103: >
01351451 EDB-84-049130
Title: Orphan radioactive waste: will it find a home.
Author(s): Davis, J.P.; Montgomery, J.T.
Affiliation: General Physics Corporation, 1000 Century Plaza, Columbia, MD 21044
Conference Title: American Nuclear Society winter meeting
Conference Location: San Francisco, CA, USA Conference Date: 30 Oct 1983
Source: Trans. Am. Nucl. Soc. (United States) v 45. Coden: TANSA
Publication Date: Oct 1983 p 170-171
Report Number(s): CONF-831047-
Document Type: Journal Article; Conference literature

Language: English
Journal Announcement: INS8403
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- radioactive waste disposal; *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- regulations
Descriptors: legislation; national government; radiation doses; state government; us nrc
Broader Terms: doses; management; materials; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 202

<DIALOG File 103: >
01351444 EDB-84-049123
Title: Classification of low-level waste under 10CFR61
Author(s): Miller, A.D.
Affiliation: Impell Corporation, 220 Montgomery Street, San Francisco, CA 94104
Conference Title: American Nuclear Society winter meeting
Conference Location: San Francisco, CA, USA Conference Date: 30 Oct 1983
Source: Trans. Am. Nucl. Soc. (United States) v 45. Coden: TANSA
Publication Date: Oct 1983 p 168-169
Report Number(s): CONF-831047-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: INS8403
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification
Descriptors: alpha-bearing wastes; carbon 14; compliance; curium 242; database management; iodine 129; nickel 63; plutonium 241; radioactivity; recommendations; regulations; sampling; strontium 90; technetium 99; tritium; US NRC
Broader Terms: actinide isotopes; actinide nuclei; alkaline earth isotopes; alpha decay radioisotopes; beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; curium isotopes; days living radioisotopes; even-even nuclei; even-odd nuclei; heavy nuclei; hours living radioisotopes; hydrogen isotopes; intermediate mass nuclei; internal conversion radioisotopes; iodine isotopes; isomeric transition isotopes; isotopes; light nuclei; management; materials; national organizations; nickel isotopes; nuclei; odd-even nuclei; plutonium isotopes; radioactive materials; radioactive wastes; radioisotopes; strontium isotopes; technetium isotopes; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E5200* -- Waste Disposal

Citation 203

<DIALOG File 103: >
01351425 EDB-84-049104
Author(s): Merz, E.
Title: Classification of radioactive waste and determination of waste specifications as well as conditions of acceptance for ultimate storage
Original Title: Klassifizierung radioaktiver Abfaelle sowie Festlegung von Abfallspezifikationen und

Annahmebedingungen fuer die Endlagerung
Corporate Source: Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie der Nuklearen Entsorgung
Publication Date: Apr 1983 p 40
Report Number(s): Juel-Spez-201
Order Number: DE84750510
Document Type: Report
Language: German
Journal Announcement: ERA8312
Availability: NTIS (US Sales Only), PC A03/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS).
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: The determination of waste specifications and conditions of acceptance must follow a certain scheme, the basics of which will be presented. First the types of waste and the ultimate storage facilities will be characterized. The various categories of waste will be listed in a universally valid system, and the preliminary conditioning options will be determined. Based on the results of safety analysis taking into account the whole system - geological circumstances, ultimate store mines, types and forms of waste - specifications for the various ultimate storage products are to be derived following iterative methods. Suggestions though not of a binding nature and probably subject to eventual revisions in part will be presented. To ensure the safety goals, i.e. the exclusion of radioactivity from the human biosphere, appropriate quality control is required concerning the production and the acceptance at the ultimate store. The guiding principles to be heeded will be discussed in brief.;
Major descriptors: *radioactive waste disposal -- specifications; *radioactive wastes -- classification; *waste forms -- specifications
Descriptors: geologic deposits; iterative methods; maximum permissible concentration; radioactive waste processing; radioactivity; solidification; underground disposal
Broader Terms: management; materials; phase transformations; processing; radioactive materials; safety standards; standards; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing

Citation 204

<DIALOG File 103: >
01344460 EDB-84-042138
Title: Final waste classification and waste form technical position papers
Corporate Source: Nuclear Regulatory Commission, Washington, DC (USA)
Publication Date: May 1983 p 27
Report Number(s): NRC-4900815
Order Number: DE84900815
Document Type: Report
Language: English
Journal Announcement: ERA8403
Availability: NTIS, PC A03/MF A01 - GPO.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); NTS (NTIS).
Country of Origin: United States
Country of Publication: United States
Abstract: The waste classification technical position paper describes overall procedures acceptable to NRC staff which may be used by licensees to determine the presence and concentrations of the radionuclides listed in section 61.55, and thereby classifying waste for near-surface disposal. This technical position paper also provides guidance on the types of information which should be included in shipment manifests accompanying waste shipments to near-surface disposal facilities. The technical position paper on waste form provides guidance to waste generators on test methods and results acceptable to NRC staff for implementing the 10 CFR Part 61 waste form requirements.

It can be used as an acceptable approach for demonstrating compliance with the 10 CFR Part 61 waste structural stability criteria. This technical position paper includes guidance on processing waste into an acceptable stable form, designing acceptable high-integrity containers, packaging cartridge filters, and minimizing radiation effects on organic ion-exchange resins. The guidance in the waste form technical position paper may be used by licensees as the basis for qualifying process control programs to meet the waste form stability requirements, including tests which can be used to demonstrate resistance to degradation arising from the effects of compression, moisture, microbial activity, radiation, and chemical changes. Generic test data (e.g., topical reports prepared by vendors who market solidification technology) may be used for process control program qualification where such generic data is applicable to the particular types of waste generated by a licensee.;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- waste forms; *waste forms -- recommendations
Descriptors: containers; radioactive waste processing; solidification
Broader Terms: management; materials; phase transformations; processing; radioactive materials; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E5200* -- Waste Disposal
E5100 -- Waste Treatment

Citation 205

<DIALOG File 103: >
01322777 AIX-14-777214; EDB-84-020451
Title: Characterization of conditioned low- and intermediate-level wastes
Author(s): Alexandre, D.; Pottier, P. (CEA Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France)); Billon, A. (CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France)); Bourdr ez, J. (Agence Nationale pour la Gestion des Dechets Radioactifs, Paris (France)); Nomine, J.C. (CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France)); Tassigny, C. de (CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France))
Title: Conditioning of radioactive wastes for storage and disposal. Proceedings of an international symposium organized by the IAEA, the CEC and the OECD NEA and held in Utrecht, the Netherlands, 21-25 June 1982
Series/Collection Title: Proceedings series
Conference Title: International symposium on the conditioning of radioactive wastes for storage and disposal
Conference Location: Utrecht, Netherlands Conference Date: 21 Jun 1982
Publisher: IAEA, Vienna, Austria
Publication Date: 1983 p 323-345
Report Number(s): CONF-820651-; IAEA-SM-261/5
Document Type: Analytic of a Book; Conference literature
Language: French
Journal Announcement: EDB8308
Country of Origin: France
Country of Publication: International Atomic Energy Agency <IAEA>
Abstract: All radioactive wastes must be conditioned to satisfy the criteria for disposal of them in the ground. In accordance with the specifications laid down by the Agence nationale pour la gestion des dechets radioactifs (French National Agency for Radioactive Waste Management - ANDRA), waste characterization records must be drawn up, with the relevant tests being carried out under approved conditions. The paper summarizes the principal results acquired in laboratories of the French Atomic Energy Commission (CEA) under the characterization programme, which was initiated by ANDRA and to which the Commission of European Communities (CEC) has contributed within the framework of its five-year indirect-action programme (1980-84). The principal aspects of these characterization tests are concerned with leaching from normal-sized packages, techniques measuring the radioisotope diffusion rate in thermosetting resins, study of the chemical forms of the radioisotopes released and assessment of the resistance of the coatings to the action of micro-organisms in the soil.;
Major descriptors: *intermediate-level radioactive wastes -- classification; *low-level radioactive wastes --

classification; *radioactive waste processing -- intermediate-level radioactive wastes; *radioactive waste processing -- low-level radioactive wastes
Descriptors: diffusion; fission product release; leaching; matrix materials; microorganisms; packaging; protective coatings; radioisotopes; research programs; resins; testing
Broader Terms: coatings; dissolution; isotopes; management; materials; organic compounds; organic polymers; petrochemicals; petroleum products; polymers; processing; radioactive materials; radioactive wastes; separation processes; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E51* -- Waste Treatment

Citation 206

<DIALOG File 103: >
01322728 AIX-14-777215; EDB-84-020402
Title: Assessment of the role of testing and prediction of waste form performance for storage and disposal Author(s): Pottier, P. (CEA Centre d'Etudes Nucleaires de Cadarache, 13-Saint-Paul-les-Durance (France)); Johnston, P.D.; Maestas, E. (Nuclear Energy Agency, 75 - Paris (France))
Title: Conditioning of radioactive wastes for storage and disposal. Proceedings of an internationalsymposium organized by the IAEA, the CEC and the OECD NEA and held in Utrecht, the Netherlands, 21-25 June 1982
Series/Collection Title: Proceedings series
Conference Title: International symposium on the conditioning of radioactive wastes for storage and disposal
Conference Location: Utrecht, Netherlands Conference Date: 21 Jun 1982
Publisher: IAEA, Vienna, Austria
Publication Date: 1983 p 347-356
Report Number(s): CONF-820651-; IAEA-SM-261/41
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8308
Country of Origin: France
Country of Publication: International Atomic Energy Agency <IAEA>
Abstract: The objective of waste form evaluation is to ensure that reliable data are available to describe nuclear waste materials in safety, quality, acceptability and environmental analyses for transport, storage and disposal requirements. Although many test methods are routinely used for different purposes in the nuclear fuel cycle, there is a need for test methods to yield comparable data so that waste products can be uniformly classified or characterized. In the absence of international, or in some cases national, agreement on the methodology for particular tests it is often difficult if not impossible to compare the results obtained by different groups of workers even for similar waste/binder combinations. Recognizing this problem, the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development convened a group of technical experts from its member countries to examine the present status of the methodologies and rationale for radioactive waste form evaluation and testing. The present paper describes the results of this workshop.;
Major descriptors: *radioactive wastes -- classification; *radioactive wastes -- testing
Descriptors: dry storage; matrix materials; packaging; radioactive waste disposal; radioactive waste processing; radioactive waste storage; standardization
Broader Terms: management; materials; processing; radioactive materials; spent fuel storage; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E51* -- Waste Treatment

Citation 207

<DIALOG File 103: >
01315552 INS-84-001266; EDB-84-013225

Title: Inventories and characteristics of Transuranic waste
Author(s): Jensen, R.T.
Affiliation: Chemical Systems Engineering, Rockwell International, Rocky Flats Plant, Golden, Colorado
Source: Nucl. Chem. Waste Manage. (United States) v 4:1. Coden: NCWMD
Publication Date: 1983 p 19-24
Document Type: Journal Article; Numerical data
Language: English
Journal Announcement: ERA8312
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Abstract: This report summarizes the available data on inventories and characteristics of transuranic (TRU) waste that is generated in defense and research activities regulated by the U.S. Department of Energy. The volumes of three separate categories, namely, newly generated waste, stored waste, and buried waste are reported. The data found in this report were tabulated from the most recent records of the individual sites. Characteristics presented include types of containers used, waste forms, and transuranic content.;
Major descriptors: *alpha-bearing wastes -- classification
Descriptors: experimental data; US DOE
Broader Terms: data; information; materials; national organizations; numerical data; radioactive materials; radioactive wastes; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E5000* -- Waste Management

Citation 208

<DIALOG File 103: >
01303330 AIX-14-769318; ERA-09-001972; EDB-84-001001
Title: Strategy for the disposal of low- and intermediate-level radwastes in Canada
Author(s): Dixon, D.F. (Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.); McDonnell, F.N. (ed.) (Atomic Energy of Canada Ltd., Ottawa, Ontario)
Title: Second annual conference, 1981. Proceedings
Conference Title: 21. annual international conference of Canadian Nuclear Association and 2. annual conference of Canadian Nuclear Society
Conference Location: Ottawa, Canada Conference Date: 8 Jun 1981
Publication Date: nd p 392-398
Report Number(s): INIS-mf-8473; CONF-8106200-Pt.1
Order Number: DE84780007
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8306
Availability: NTIS (US Sales Only), PC A19/MF A01.
Subfile: ERA (Energy Research Abstracts).
Country of Origin: Canada
Country of Publication: Canada
Abstract: The intent of the strategy described is to optimize both safety and cost of disposal by classifying waste segments according to hazardous lifetime and to match these to two or more selected disposl concepts graded according to containment and isolation capabilities. The bulk of low- and intermediate-level radwastes arising in Canada are a relatively short-lived hazard requiring isolation for no more than a few hundred years. Burial of this segment at tens-of-metres in quartenary deposits has been proposed as a concept worth evaluating. It is expected that part of the low- and intermediate-level radwastes will be potentially hazardous for geological time periods. Once methods of isolation for long-lived fuel wastes have been identified, these could be utilized for wastes requiring isolation for longer than a few hundred years. Disposal of a hard-rock vault is being evaluated as a reference concept and costs are presented. It is proposed that waste classification may consider more than two categories to further reduce costs and to better accommodate the radiological character of wastes. The overall disposal strategy should

be flexible enough to account for present waste management practices and anticipated future needs.;
Major descriptors: *canada -- radioactive waste disposal; *canada -- underground disposal; *radioactive waste disposal -- intermediate-level radioactive wastes; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: lifetime; radioactive waste facilities; radioactive waste processing
Broader Terms: management; materials; north america; nuclear facilities; processing; radioactive materials; radioactive wastes; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 209

<DIALOG File 103: >
01299188 INS-83-026459; EDB-83-199196
Title: Concentrations of selected short-lived isotopes in a low-level waste inventory
Author(s): Rogers, V.C.; Sandquist, G.M.; Sutherland, A.A.
Affiliation: Rogers and Associates Engineering Corp., P.O. Box 330, Salt Lake City, UT 84110
Conference Title: ANS annual meeting
Conference Location: Detroit, MI, USA Conference Date: 12 Jun 1983
Source: Trans. Am. Nucl. Soc. (United States) v 44. Coden: TANSA
Publication Date: Jun 1983 p 89-90
Report Number(s): CONF-830609-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8309
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste management -- low-level radioactive wastes
Descriptors: calculation methods; fission products; inventories; isotope ratio
Broader Terms: isotopes; management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 210

<DIALOG File 103: >
01299186 INS-83-026457; EDB-83-199194
Title: Radwaste characterization: key to an optimized waste management plan
Author(s): Pierce, R.E.
Affiliation: Gilbert Commonwealth, 209 E. Washington Avenue, Jackson, MI 49201
Conference Title: ANS annual meeting
Conference Location: Detroit, MI, USA Conference Date: 12 Jun 1983
Source: Trans. Am. Nucl. Soc. (United States) v 44. Coden: TANSA
Publication Date: Jun 1983 p 87-88
Report Number(s): CONF-830609-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: ERA8309
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States

Abstract: None;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste management -- low-level radioactive wastes
Descriptors: containers; dose rates; electric utilities; isotope ratio; process control
Broader Terms: control; management; materials; public utilities; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 211

<DIALOG File 103: >
01275415 ERA-08-053629; EDB-83-175419
Title: Classifying decommissioning wastes for allocation to appropriate final repositories
Author(s): Alder, J.C. (Nagra, Baden, Switzerland); Tunaboylu, K.; Mickels on, S. (ed.)
Title: 1982 international decommissioning symposium
Corporate Source: USDOE Technical Information Center, Oak Ridge, TN
Conference Title: DOE international decommissioning symposium
Conference Location: Seattle, WA, USA Conference Date: 10 Oct 1982
Publication Date: 1982 p VI.125-VI.138
Report Number(s): CONF-821005-
Order Number: DE83008702
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8310
Availability: NTIS, PC A99/MF A01; 1.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: Switzerland
Country of Publication: United States
Abstract: For the safe disposal of radioactive wastes in different repositories, it is of advantage to classify them in well-defined conditioned categories, appropriate for final disposal. These categories, the so-called waste sorts are characterized by similar radionuclide distribution, similar nuclide-specific activity concentrations and similar waste matrix. A methodology is presented for classifying decommissioning wastes and is applied to the decommissioning wastes arising from a Swiss program of 6 GWe. The amounts and nuclide-specific activity inventories of the decommissioning waste sorts have been estimated. A first allocation into two different repository types has been performed. Such a classification enables one to define the source parameters for repository safety analysis and allows one to allocate the different waste categories into appropriate final repositories. This work presents a first iteration to determine which waste sorts belong to which repository type. The characteristics of waste sorts have to be better defined and the protective strength of the repository barriers has to be optimized. 7 references, 2 figures, 4 tables.;
Major descriptors: *radioactive wastes -- classification; *reactor decommissioning -- radioactive wastes
Descriptors: radioactive waste disposal; safety; sweden
Broader Terms: decommissioning; europe; management; materials; radioactive materials; scandinavia; waste disposal; waste management; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E52* -- Waste Disposal
E51 -- Waste Treatment

Citation 212

<DIALOG File 103: >
01275389 ERA-08-053625; EDB-83-175393

Title: TRU waste assay instrumentation and applications in nuclear facility decommissioning
Author(s): Umbarger, C.J.; Mickelson, S. (ed.)
Affiliation: Los Alamos National Lab., NM
Title: 1982 international decommissioning symposium
Corporate Source: USDOE Technical Information Center, Oak Ridge, TN
Conference Title: DOE international decommissioning symposium
Conference Location: Seattle, WA, USA Conference Date: 10 Oct 1982
Publication Date: 1982 p VI.10-VI.27
Report Number(s): CONF-821005-
Order Number: DE83008702
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8310
Availability: NTIS, PC A99/MF A01; 1.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: The Los Alamos TRU waste assay instrumentation development program is described with application to decommissioning of outdated nuclear facilities. Field portable survey instruments are detailed for monitoring surfaces and soils. Bulk waste assay systems are then described for the analysis of drummed and crated wastes. 20 references, 7 figures, 1 table.;
Major descriptors: *alpha-bearing wastes -- classification
Descriptors: decommissioning; LASL; nondestructive analysis; nuclear facilities; qualitative chemical analysis; radiation detectors; radiation monitoring; soils; surfaces
Broader Terms: chemical analysis; materials; measuring instruments; monitoring; national organizations; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
400103 -- Radiometric & Radiochemical Procedures -- (-1987)
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
INIS Subject Categories: E51* -- Waste Treatment
B11 -- Chemical & Isotopic Analysis

Citation 213

<DIALOG File 103: >
01267464 ERA-08-051093; EDB-83-167467
Author(s): Dougherty, D.; Adams, J.W.
Title: Evaluation of the Three Mile Island Unit 2 reactor building decontamination process
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Publication Date: Aug 1983 p 64
Report Number(s): NUREG/CR-3381; BNL-NUREG-51689
Order Number: DE83017360
Contract Number (DOE): AC02-76CH00016
Note: Portions are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: NTS8309
Availability: NTIS, PC A04/MF A01; 1 - GPO $4.50.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: Decontamination activities from the cleanup of the Three Mile Island Unit 2 Reactor Building are generating a variety of waste streams. Solid wastes being disposed of in commercial shallow land burial include trash

and rubbish, ion-exchange resins (Epicor-II) and strippable coatings. The radwaste streams arising from cleanup activities currently under way are characterized and classified under the waste classification scheme of 10 CFR Part 61. It appears that much of the Epicor-II ion-exchange resin being disposed of in commerical land burial will be Class B and require stabilization if current radionuclide loading practices continue to be followed. Some of the trash and rubbish from the cleanup of the reactor building so far would be Class B. Strippable coatings being used at TMI-2 were tested for leachability of radionuclides and chelating agents, thermal stability, radiation stability, stability under immersion and biodegradability. Actual coating samples from reactor building decontamination testing were evaluated for radionuclide leaching and biodegradation.;
Major descriptors: *three mile island-2 reactor -- decontamination; *three mile island-2 reactor -- radioactive waste management
Descriptors: radioactive wastes
Broader Terms: cleaning; enriched uranium reactors; management; materials; power reactors; PWR type reactors; radioactive materials; reactors; the RMAL reactors; waste management; wastes; water cooled reactors; water moderated reactors
Subject Categories: 210200* -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E32* -- Power Reactors, Nonbreeding, Light Water Moderated, Non-Boiling Water Cooled (PWR, etc types)
E50 -- Waste Management

Citation 214

<DIALOG File 103: >
01266773 ERA-08-050799; EDB-83-166776
Title: Classification of toxic chemical waste streams from nuclear reactors
Author(s): Wickham, L.E.
Affiliation: EG and G Idaho Inc., P.O. Box 1625, Idaho Falls, ID 83415
Conference Title: ANS annual meeting
Conference Location: Detroit, MI, USA Conference Date: 12 Jun 1983
Source: Trans. Am. Nucl. Soc. (United States) v 44. Coden: TANSA
Publication Date: Jun 1983 p 65-66
Report Number(s): CONF-830609-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: INS8309
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *hazardous materials -- chemical composition; *hazardous materials -- classification; *hazardous materials -- comparative evaluations; *hazardous materials -- toxicity; *low-level radioactive wastes -- classification; *low-level radioactive wastes -- comparative evaluations; *low-level radioactive wastes -- toxicity
Descriptors: liquid wastes; nuclear power plants; streams; toxic materials; waste management
Broader Terms: management; materials; nuclear facilities; power plants; radioactive materials; radioactive wastes; surface waters; thermal power plants; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
220502 -- Nuclear Reactor Technology -- Environmental Aspects -- Radioactive Effluents
INIS Subject Categories: E52* -- Waste Disposal
C52 -- Radiation Hazards & Safety Evaluations of Nuclear Installations

Citation 215

<DIALOG File 103: >

01266770 ERA-08-050796; EDB-83-166773
Title: The NRC approach to dealing with hazardous substances in low-level radioactive waste
Author(s): Lohaus, P.H.; Johnson, T.C.
Affiliation: U.S. Nuclear Regulatory Commission, Washington, DC 20555
Conference Title: ANS annual meeting
Conference Location: Detroit, MI, USA Conference Date: 12 Jun 1983
Source: Trans. Am. Nucl. Soc. (United States) v 44. Coden: TANSA
Publication Date: Jun 1983 p 63-64
Report Number(s): CONF-830609-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: INS8309
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *low-level radioactive wastes -- chemical composition; * low-level radioactive wastes -- classification; *radioactive waste disposal -- licensing; *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- safeguard regulations; *radioactive waste disposal -- underground disposal
Descriptors: hazardous materials; radionuclide migration; toluene; toxicity; us nrc; xylenes
Broader Terms: aromatics; environmental transport; hydrocarbons; management; mass transfer; materials; national organizations; organic compounds; radioactive materials; radioactive wastes; regulations; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 216

<DIALOG File 103: >
01266708 ERA-08-050750; EDB-83-166711
Title: Low-level radioactive waste management handbook series: an introduction
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA). Low-Level Waste Management Program
Publication Date: Aug 1983 p 76
Report Number(s): DOE/LLW-13Ta
Order Number: DE83017128
Contract Number (DOE): AC07-76ID01570
Document Type: Report
Language: English
Journal Announcement: NTS8309
Availability: NTIS, PC A05/MF A01.
Subfile: NTS (NTIS); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: This introductory volume for the low-level radioactive waste
management handbook series provides general background information concerning low-level waste. Topics covered here are: (1) waste classification; (2) sources and forms of low-level waste; (3) various waste treatment methods presently employed by low-level waste generators; (4) low-level waste generation rates; (5) practices and regulations for packaging, transportation, and personnel and environmental monitoring; (6) history of commercial shallow land disposal sites; and (7) typical operating practices at shallow land disposal sites. Also, a glossary of terms that appear throughout the handbook series and a selected bibliography of publications related to low-level waste management are included as appendixes. 57 references, 3 figures, 5 tables.;
Major descriptors: *low-level radioactive wastes -- manuals; *radioactive waste management -- low-level radioactive wastes
Descriptors: classification; operation; packaging; radioactive waste disposal; radioactive waste facilities; radioactive

waste processing; underground disposal; waste transportation
Broader Terms: document types; management; materials; nuclear facilities; processing; radioactive materials; radioactive wastes; transport; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management

Citation 217

<DIALOG File 103: >
01258483 EDB-83-158485
Author(s): Beauchamp, J.J.; Wright, T.; Schultz, F.J.; Haff, K.; Monroe, R.J.
Title: Statistical sampling plan for the TRU waste assay facility
Corporate Source: Oak Ridge National Lab., TN (USA) North Carolina State Univ., Raleigh (USA). Dept. of Statistics
Publication Date: Aug 1983 p 38
Report Number(s): ORNL/CSD/TM-203
Order Number: DE83016962
Contract Number (DOE): W-7405-ENG-26
Document Type: Report
Language: English
Journal Announcement: ERA8309
Availability: NTIS, PC A03/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: Due to limited space, there is a need to dispose appropriately of the Oak Ridge National Laboratory transuranic waste which is presently stored below ground in 55-gal (208-l) drums within weather-resistant structures. Waste containing less than 100 nCi/g transuranics can be removed from the present storage and be buried, while waste containing greater than 100 nCi/g transuranics must continue to be retrievably stored. To make the necessary measurements needed to determine the drums that can be buried, a transuranic Neutron Interrogation Assay System (NIAS) has been developed at Los Alamos National Laboratory and can make the needed measurements much faster than previous techniques which involved gamma-ray spectroscopy. The previous techniques are reliable but time consuming. Therefore, a validation study has been planned to determine the ability of the NIAS to make adequate measurements. The validation of the NIAS will be based on a paired comparison of a sample of measurements made by the previous techniques and the NIAS. The purpose of this report is to describe the proposed sampling plan and the statistical analyses needed to validate the NIAS. 5 references, 4 figures, 5 tables.;
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- sampling; *transuranium elements -- nuclear reaction analysis
Descriptors: nondestructive analysis; statistics
Broader Terms: chemical analysis; elements; materials; mathematics; radioactive materials; radioactive wastes; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E51* -- Waste Treatment
B11 -- Chemical & Isotopic Analysis
E52 -- Waste Disposal

Citation 218

<DIALOG File 103: >
01247614 ERA-08-045675; EDB-83-147615
Author(s): Caldwell, J.T.; Close, D.A.; Kuckertz, T.H.; Kunz, W.E.; Pratt, J.C.; Haff, K.W.; Schultz, F.J.

Title: Test and evaluation of a high-sensitivity assay system for bulk transuranic waste
Corporate Source: Los Alamos National Lab., NM (USA) Oak Ridge National Lab., TN (USA)
Conference Title: 24. annual meeting of the Institute of Nuclear Materials Management
Conference Location: Vail, CO, USA Conference Date: 10 Jul 1983
Publication Date: 1983 p 6
Report Number(s): LA-UR-83-2084; CONF-830709-21
Order Number: DE83015248
Contract Number (DOE): W-7405-ENG-36
Note: Portions are illegible in microfiche products
Document Type: Report; Conference literature
Language: English
Journal Announcement: NTS8308
Availability: NTIS, PC A02/MF A01; 1.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: During the past year, we tested and evaluated the performance of an assay system that accommodates 55-gal drums of transuranic waste at Oak Ridge National Laboratory. This neutron assay system provides a routine assay of fissile transuranic isotopes to the 1-mg sensitivity level with a pulsed active neutron interrogation based on the differential dieaway technique. A highly sensitive passive neutron measurement determines the content of spontaneous fission transuranic isotopes in each drum as well as an upper-bound estimate of the total alpha activity. All components of the combined, pulsed active and passive neutron assay system performed well on a routine basis during the test-and-evaluation period. We performed more than 400 combined passive and active assay measurements of waste drums at Oak Ridge. One-fifth of the initial set of waste drums measured contain less than 100 nCi/g of total transuranic isotopes and thus qualify legally as nontransuranic waste.;
Major descriptors: *alpha-bearing wastes -- classification
Descriptors: nondestructive analysis; nuclear reaction analysis
Broader Terms: chemical analysis; materials; radioactive materials; radioactive wastes; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
INIS Subject Categories: E51* -- Waste Treatment
B11 -- Chemical & Isotopic Analysis

Citation 219

<DIALOG File 103: >
01230639 ERA-08-040298; EDB-83-130687
Author(s): Schultz, F.J.; Haff, K.W.; Caldwell, J.T.; Close, D.A.; Kuckertz, T.H.; Kunz, W.E.; Pratt, J.C.
Title: ORNL TRU waste assay system
Corporate Source: Oak Ridge National Lab., TN (USA) Los Alamos National Lab., NM (USA)
Conference Title: 23. annual international conference of Canadian Nuclear Association
Conference Location: Montreal, Canada Conference Date: 12 Jun 1983
Publication Date: 1983 p 10
Report Number(s): CONF-830660-1
Order Number: DE83014131
Contract Number (DOE): W-7405-ENG-26
Document Type: Report; Conference literature
Language: English
Journal Announcement: NTS8307
Availability: NTIS, PC A02/MF A01.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States

Abstract: ORNL has been selected as the demonstration site for a new transuranic neutron assay system developed at the Los Alamos National Laboratory. The major objectives of the cooperative interlaboratory program are to field test, calibrate, and evaluate the neutron interrogation system, to provide a demonstration and training facility for personnel from other DOE sites and contractors, to reduce the volume of TRU waste stored at ORNL, and to provide positive identification of the radionuclide content of the ORNL TRU waste. In order to meet these objectives, a two-tier assay system utilizing the LANL neutron interrogation assay system and an upgraded gamma-ray drum scanner has been employed. This paper describes each assay technique and the results obtained from the examination of authentic ORNL TRU waste.;
Major descriptors: *alpha-bearing wastes -- classification
Descriptors: fissile materials; nondestructive analysis; nuclear reaction analysis; volume
Broader Terms: chemical analysis; fissionable materials; materials; radioactive materials; radioactive wastes; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
400101 -- Activation, Nuclear Reaction, Radiometric & Radiochemical Procedures
INIS Subject Categories: E51* -- Waste Treatment
B11 -- Chemical & Isotopic Analysis

Citation 220

<DIALOG File 103: >
01230618 ERA-08-040264; EDB-83-130666
Title: Will we ever get a set of stable transport regulations.
Author(s): Brobst, W.A.; Thomas, J.T.
Affiliation: The Transport Environment, SR 85 Old Squaw Drive, Kitty Hawk, NC 27949
Conference Title: American Nuclear Society winter meeting
Conference Location: Washington, DC, USA Conference Date: 14 Nov 1982
Source: Trans. Am. Nucl. Soc. (United States) v 43. Coden: TANSA
Publication Date: 1982 p 418
Report Number(s): CONF-821103-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB8306
Subfile: ERA (Energy Research Abstracts).
Country of Origin: United States
Abstract: None;
Major descriptors: *radioactive wastes -- classification; *radioactive wastes -- transport regulations; *spent fuels -- transport regulations; *USA -- transport regulations
Descriptors: packaging rules; radioisotopes; transport; us dot; us nrc
Broader Terms: energy sources; fuels; isotopes; materials; national organizations; north america; nuclear fuels; radioactive materials; reactor materials; regulations; wastes
Subject Categories: 050900* -- Nuclear Fuels -- Transport, Handling, & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects

Citation 221

<DIALOG File 103: >
01201248 EDB-83-101285
Title: Managing low-level radioactive wastes: a technical analysis
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Publication Date: Jun 1981 p 214
Report Number(s): LLWMP-7
Order Number: DE83012493
Contract Number (DOE): AC07-76ID01570

Note: Portions are illegible in microfiche products
Document Type: Report
Language: English
Journal Announcement: ERA8306
Availability: NTIS, PC A10/MF A01; 1.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: This document analyzes the following seven issues: waste classification; reducing waste volumes; waste packaging; environmental release; storage for decay; interim storage; and disposal options. Several alternatives were proposed in the strategy c to help resolve these issues. While one alternative was specifically recommended in the strategy, this reference document gives equal consideration to each alternative as presented.
Major descriptors: *radioactive waste management -- low-level radioactive wastes
Descriptors: cost; maximum permissible concentration; packaging; radioactive waste disposal; radioactive waste processing; volume
Broader Terms: management; materials; processing; radioactive materials; radioactive wastes; safety standards; standards; waste disposal; waste management; waste processing; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
052001 -- Nuclear Fuels -- Waste Processing
053000 -- Nuclear Fuels -- Environmental Aspects
054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: E52* -- Waste Disposal
E51 -- Waste Treatment
C52 -- Radiation Hazards & Safety Evaluations of Nuclear Installations
C54 -- Radiation Protection Procedures

Citation 222

<DIALOG File 103: >
01192840 INS-83-008251; ERA-08-029213; EDB-83-092876
Title: 10 CFR 61 waste form requirements
Author(s): Johnson, T.C.; Lohaus, P.H.; Smith, R.D.
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Proceedings of the ANS topical meeting on the treatment and handling of radioactive wastes
Conference Title: ANS topical meeting on treatment and handling of radioactive wastes
Conference Location: Richland, WA, USA Conference Date: 19 Apr 1982
Publisher: Battelle Press,Columbus, OH
Publication Date: 1982 p 465-466
Report Number(s): CONF-820424-
Order Number: DE83007269
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8304
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission (NRC) staff is preparing a regulation on low-level radioactive waste management, 10 CFR 61. The performance objectives of this regulation stress: (1) the long-term stability of the disposal site to minimize water infiltration into trenches and to minimize remedial maintenance operations, and (2) the protection of individuals as well as populations. Based on these objectives, a waste classification system has been developed which is used for determining the waste form requirements for specific wastes.;
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- regulations;

*radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- underground disposal; *radioactive waste management -- low-level radioactive wastes
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E52* -- Waste Disposal
F42 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 223

<DIALOG File 103: >
01183470 ERA-08-029143; EDB-83-083505
Title: Light-water reactors low-level waste forms
Author(s): Guilbeault, B.D.; Yalcintas, M.G. (comp.)
Affiliation: NUS Corp., Gaithersburg, MD
Title: Symposium on low-level waste disposal: facility design, construction, and operating practices
Conference Title: Symposium on low level waste disposal
Conference Location: Washington, DC, USA Conference Date: 29 Sep 1982
Publication Date: Mar 1983 p 161-175
Report Number(s): NUREG/CP-0028-Vol.3; CONF-820911-
Order Number: DE83009128
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8305
Availability: NTIS, PC A19/MF A01; 1 - GPO $11.00.
Subfile: ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: In the proposed 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste, three waste-classification groups for low-level waste are identified. This classification system is based on the radionuclide inventory. The category into which a waste falls determines the requirements for its disposal. With light-water reactor waste, the concentration of some radionuclides can be easily determined through routine analytical methods; however, some radionuclides are impractical to measure. Numerous past studies have characterized the physical waste form and have looked at the easily determined radionuclides. This paper will review the physical waste forms, outline where analytical information is currently available and/or easily obtainable, and discuss what further information on radionuclide concentrations is needed to meet the requirements of 10 CFR 61. The paper also discusses the possible changes in the waste form due to the increased emphasis of volume reduction and finally, several areas that will need to be addressed in the future. These areas are: ways that reactor operators can meet the analytical-characterization requirements for radionuclides in 10 CFR 61. Changes in disposal costs that may result from the adoption of 10 CFR 61. In its present form, 10 CFR 61 may influence the future light-water reactor waste form. The reactor-plant operator may find full-volume reduction and solidification a desirable alternative to segregation and a difficult if not impossible radionuclide characterization to dispose of Class A waste.;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: containers; solid wastes
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
210100 -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
220502 -- Nuclear Reactor Technology -- Environmental Aspects -- Radioactive Effluents

Citation 224

<DIALOG File 103: >
01183421 INS-83-008186; ERA-08-029183; EDB-83-083456
Title: Low- and intermediate-level waste management practices in Belgium
Author(s): Claes, J.C.; Van de Voorde, N.; Dejonghe, P.
Affiliation: Study Centre for Nuclear Energy-CEN/SCK, Mol, Belgium
Title: Proceedings of the ANS topical meeting on the treatment and handling of radioactive wastes
Conference Title: ANS topical meeting on treatment and handling of radioactive wastes
Conference Location: Richland, WA, USA Conference Date: 19 Apr 1982
Publisher: Battelle Press, Columbus, OH
Publication Date: 1982 p 234-242
Report Number(s): CONF-820424-
Order Number: DE83007269
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8304
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: Belgium
Country of Publication: United States
Abstract: The main ongoing nuclear activities and the organization of LLW and ILW management in Belgium are described. Data are presented on the waste arisings and characteristics. The treatment and conditioning techniques, currently applied at the waste processing plants, are reported. Attention is also drawn to the new processes and management improvements, which are being implemented and will become operational in 1982to 1983. The importance of sea dumping as a LLW disposal strategy for Belgium, among other West-European countries, is underlined. Information is given on the packaging procedures and sea dumping operations.
Major descriptors: *belgium -- radioactive waste disposal; *belgium -- radioactive waste management; *belgium -- radioactive waste processing; *intermediate-level radioactive wastes -- classification; *low-level radioactive wastes -- classification; *radioactive waste disposal -- geologic deposits; *radioactive waste disposal -- intermediate-level radioactive wastes; *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- marine disposal; *radioactive waste processing -- intermediate-level radioactive wastes; *radioactive waste processing -- low-level radioactive wastes
Descriptors: combustion; solidification
Broader Terms: chemical reactions; europe; management; materials; oxidation; phase transformations; processing; radioactive materials; radioactive wastes; thermochemical processes; waste disposal; waste management; waste processing; wastes; western europe
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E51* -- Waste Treatment
E52 -- Waste Disposal

Citation 225

<DIALOG File 103: >
01132020 ERA-08-011882; EDB-83-032027
Author(s): Wickham, L.E.; Rope, S.K.
Title: Waste classification system for low-level radioactive wastes
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 6. international symposium on the scientific basis for radioactive waste management
Conference Location: Boston, MA, USA Conference Date: 1 Nov 1982
Publication Date: 1982 p 7
Report Number(s): EGG-M-22882; CONF-821107-43
Order Number: DE83005276

Contract Number (DOE): AC07-76ID01570
Document Type: Report; Conference literature
Language: English
Journal Announcement: NTS8302
Availability: NTIS, PC A02/MF A01.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: Some low-level radioactive waste represents both a chemical and radiological hazard, and it is desirable that management practices take this into account. This paper describes a waste classification system that could provide guidance on how mixed wastes could be separated for disposal, and the degree of disposal isolation each waste material or shipment needs. An example of this system's use is provided.
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: radioactive waste management; toxic materials; toxicity
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 226

<DIALOG File 103: >
01122930 ERA-08-009228; EDB-83-022934
Title: Waste classification: a proposed methodology for classifying low-level radioactive waste
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Publication Date: Dec 1982 p 50
Report Number(s): DOE/LLW-14T
Order Number: DE83003857
Contract Number (DOE): AC07-76ID01570
Document Type: Report
Language: English
Journal Announcement: NTS8301
Availability: NTIS, PC A03/MF A01.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: Since low-level radioactive waste presents both a chemical and a radiological hazard, it is desirable that management practices take this into account. This paper describes a waste classification system that could provide a basis for such management practices. The classification method formulates the hazard of waste as the ratio of potential exposure or intake to a selected limit. Potential exposure or intake incorporates four factors: (a) the nature and (b) amount of toxic materials disposed in the soil, (c) the availability of the waste to enter an environmental pathway potentially exposing humans, and (d) the decay products. The system could provide guidance on how mixed wastes should be separated for disposal, and the degree of disposal isolation each waste material or shipment needs. Examples of the system's use are provided.
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste management -- low-level radioactive wastes
Descriptors: environmental exposure pathway; radioactive waste disposal; soils; underground disposal
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

053000 -- Nuclear Fuels -- Environmental Aspects
510301 -- Environment, Terrestrial -- Radioactive Materials Monitoring & Transport -- Soil -- (-1987)
INIS Subject Categories: E52* -- Waste Disposal
C52 -- Radiation Hazards & Safety Evaluations of Nuclear Installations
B31 -- Land

Citation 227

<DIALOG File 103: >
01122870 EDB-83-022874
Title: Volume reduction of spent resin and its waste classification
Author(s): Upadye, N.Y.; Wu, J.M.
Affiliation: Rensselaer Polytechnic Institute, Troy, NY 12181
Conference Title: American Nuclear Society annual meeting
Conference Location: Los Angeles, CA, USA Conference Date: 6 Jun 1982
Source: Trans. Am. Nucl. Soc. (United States) v 41. Coden: TANSA
Publication Date: Jun 1982 p 108
Report Number(s): CONF-820609-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: INS8208
Subfile: INS (US Atomindex input).
Country of Origin: United States
Abstract: None;
Major descriptors: *radioactive waste processing -- ground disposal; *radioactive waste processing -- ion exchange materials; *radioactive waste processing -- low-level radioactive wastes
Descriptors: classification; pwr type reactors; volume
Broader Terms: management; materials; processing; radioactive materials; radioactive wastes; reactors; waste disposal; waste management; waste processing; wastes; water cooled reactors; water moderated reactors
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E51* -- Waste Treatment

Citation 228

<DIALOG File 103: >
01122806 ERA-08-009281; EDB-83-022810
Title: Industry expectations of the DOE LLWMP
Author(s): DeLong, M.M.; Large, D.E.; Mezga, L.J.; Stratton, L.E.; Rose, R.R. (comps.)
Affiliation: Northern States Power Co., Minneapolis, MN
Title: Proceedings of the fourth annual participants' information meeting, DOE Low-Level Waste Management Program
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: 4. annual DOE LLWMP participant's information meeting
Conference Location: Denver, CO, USA Conference Date: 31 Aug 1982
Publication Date: Oct 1982 p 21-28
Report Number(s): ORNL/NFW-82/18; CONF-820854-
Order Number: DE83003193
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: INS8301
Availability: NTIS, PC A99/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).

Country of Origin: United States
Country of Publication: United States
Abstract: Time will be limited for regional commissions to become fully operational and site developers to license and open disposal facilities. DOE and its contractors have extensive experience and capability for LLW management that can be utilized. Priority activities for new site development, waste generation reduction, waste classification and decontamination residue disposal are discussed. DOE should confer or work jointly with organizations to provide needed information. 3 figures.;
Major descriptors: *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste management -- low-level radioactive wastes; *us doe -- radioactive waste management
Descriptors: classification; decontamination; minimization; nuclear industry; site preparation
Broader Terms: cleaning; industry; management; materials; national organizations; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 229

<DIALOG File 103: >
01102121 ERA-08-004306; EDB-83-002121
Title: Community development: deep-level stratification. Annual 1980 report of the Karlsruhe Nuclear Research Center. Society for radiation and environmental studies
Corporate Source: Gesellschaft fuer Strahlen- und Umweltforschung m.b.H. Muenchen (Germany, F.R.). Inst. fuer Tieflagerung Kernforschungszentru m Karlsruhe G.m.b.H. (Germany, F.R.)
Publication Date: 1980 p 46
Report Number(s): GSF-T-132; KFK-3245
Order Number: DE82903866
Note: Portions of document are illegible
Document Type: Report
Language: German
Journal Announcement: NTS8212
Availability: NTIS (US Sales Only), PC A03/MF A01.
Subfile: NTS (NTIS); ERA (Energy Research Abstracts).
Country of Origin: Germany, Federal Republic of
Country of Publication: Germany, Federal Republic of
Abstract: A description is given of studies undertaken at the Institute on the development and study of waste disposal systems for radioactive waste products, including a classification of waste products, equipment safety, and future projects. Also included is a list of publications sponsored by the Institute. 25 figures, 10 tables.;
Major descriptors: *federal republic of germany -- radioactive waste disposal; *radioactive wastes -- classification
Descriptors: bibliographies; safety
Broader Terms: document types; europe; management; materials; radioactive materials; waste disposal; waste management; wastes; western europe
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage

Citation 230

<DIALOG File 103: >
01102104 AIX-13-700591; EDB-83-002104
Title: Radioactive wastes: origin, classification and medium and long dated industrial management
Author(s): Lavie, J.M.; Faussat, A.; Pradel, J. (CEA, Agence Nationale pour la Gestion des Dechets Radioactifs, Paris (France))
Source: Armement. Bull. Inf. Liaison. (France) v 70.
Publication Date: Apr 1982 p 37-53

Document Type: Journal Article
Language: French
Journal Announcement: EDB8209
Country of Origin: France
Abstract: Virtually all the radioactive waste is produced by the fuel cycle, the remainder comes from radioelements used in industry, in medicine, teaching and research. They are classified into low, medium and high activity. The aim of the control is to ensure the protection of individuals and the public against radiological hazards and to safeguard the environment. The production, control, treatment and storage of mining wastes and those produced by the fuel cycle are examined.
Major descriptors: *radioactive waste management; *radioactive waste processing; *radioactive waste storage; *radioactive wastes -- classification; *radioactive wastes -- origin
Descriptors: radioactive waste disposal; safety
Broader Terms: management; materials; processing; radioactive materials; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E51* -- Waste Treatment

Citation 231

<DIALOG File 103: >
01002486 ERA-08-001730; EDB-82-177347
Title: Waste classification system for low-level radioactive wastes
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Conference Title: 4. annual DOE LLWMP participant's information meeting
Conference Location: Denver, CO, USA Conference Date: 31 Aug 1982
Publication Date: 1982 p 9
Report Number(s): EGG-M-18982; CONF-820854-16
Order Number: DE83000042
Contract Number (DOE): AC07-76ID01570
Note: Portions of this document are illegible
Document Type: Report; Conference literature
Language: English
Journal Announcement: NTS8211
Availability: NTIS, MF A01.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: In this paper a new method for classifying low-level waste is introduced. The method is based on the geological hazard index introduced by Smith et al. (Smith, C.F.; Cohen, J.J.; McKone, T.E., 1980. A Hazard Index for Underground Toxic Material, UCRL-52889), and provides a measure of the total innate hazard of the waste after disposal. The classification system is designed to be a simple, cost effective and efficient waste screening tool that is conservative and applicable for the great majority of waste streams. The majority of the classification systems methodology has been developed and presented here. Three major tasks still remain to be done. First, values for the persistence of chemicals need to be developed. Second, availability factors must be derived for the ingestion of organic compounds and inhalation of volatile compounds. Third, a thorough review and evaluation of the toxic dose level methodology must be done. The waste classification index has been developed to allow some quantification of total waste hazard. The methodology has been designed to be as general as possible, so that the index would be applicable over a broad range of waste streams. The approach is intuitively simple and conservative. The waste classification index can be very useful as a measurement tool to aid in waste management decisions.;
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- hazards; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: geologic deposits; underground disposal

Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 232

<DIALOG File 103: >
00987090 AIX-13-696953; EDB-82-161948
Title: Chemistry of radioactive waste treatmentAuthor(s): Tachikawa, E.; Kobayashi, Y.; Muromura, T.; Aratono, Y. (Japa n Atomic Energy Research Inst., Tokai, Ibaraki. Tokai Research Establishment)
Source: Nippon Genshiryoku Gakkaishi (Japan) v 23:3. Coden: NGEGA
Publication Date: Mar 1981 p 154-165
Document Type: Journal Article
Language: Japanese
Journal Announcement: EDB8209
Country of Origin: Japan
Abstract: The radioactive wastes arising in various nuclear facilities may be divided broadly in gaseous, liquid and solid ones. To their treatment technology, many chemical processes are applied. Review is made on such chemical techniques, now employed and considered for future applications, for the radioactive wastes mainly from reactors and a fuel reprocessing plant and also on the problems involved. The aspects concerned are their collection, fixation and storage. The technology of radioactive waste treatment may reach to its almost satisfactory level in the near future. Among various techniques, the most suitable ones are to be chosen paying attention also to waste disposal. The following matters are described: waste classification, gaseous wastes of iodine, tritium, rare gases, and /sup 14/C, liquid wastes of low, middle and high levels, and solid wastes of low and high levels.
Major descriptors: *radioactive waste processing -- chemistry
Descriptors: adsorption; carbon 14; decontamination; gaseous wastes; heavy water; iodine isotopes; ion exchange; krypton isotopes; liquid wastes; radioactive waste storage; radioactive wastes; solid wastes; solidification; solvent extraction; tritium; xenon isotopes
Broader Terms: beta decay radioisotopes; beta-minus decay radioisotopes; carbon isotopes; cleaning; even-even nuclei; extraction; hydrogen compounds; hydrogen isotopes; isotopes; light nuclei; management; materials; nuclei; odd-even nuclei; oxygen compounds; phase transformations; processing; radioactive materials; r dioisotopes; separation processes; sorption; storage; waste management; waste processing; waste storage; wastes; water; years living radioisotopes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E51* -- Waste Treatment

Citation 233

<DIALOG File 103: >
00987024 INS-82-021996; ERA-07-060973; EDB-82-161882
Author(s): Gause, E.P.
Title: Study of non-fuel cycle wastes (Shallow land burial)
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Conference Title: 4. annual DOE LLWMP participant's information meeting
Conference Location: Denver, CO, USA Conference Date: 31 Aug 1982
Publication Date: 1982 p 7
Report Number(s): BNL-NUREG-31826; CONF-820854-7
Order Number: DE82022050
Contract Number (DOE): AC02-76CH00016
Document Type: Report; Conference literature
Language: English

Journal Announcement: EDB8210
Availability: NTIS, PC A02/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: The low-level radioactive waste generated by many non-fuel cycle industries and institutions is not as well characterized as that produced by nuclear power plants. To better understand the variety of non-fuel cycle waste products now being disposed of by commercial shallow land burial (SLB) and to assess specific packages in advance of the enactment of the proposed regulation, 10 CFR Part 61 (dated June 29, 1981), Licensing Requirements for Land Disposal of Radioactive Waste, the United States Nuclear Regulatory Commission (NRC) requested Brookhaven National Laboratory (BNL), under FIN A-3165, (in April 1981), to provide technical assistance in expanding the data base on the physical and chemical characteristics of these wastes. With the cooperation of two major corporations, this program enabled the NRC to examine the achievability of the proposed 10 CFR Part 61 criteria, prior to the enactment of the regulation.
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: chemical composition; packaging; physical properties; regulations; stability; standardized terminology; transport
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 234

<DIALOG File 103: >
00979676 ERA-07-059286; EDB-82-154533
Author(s): Cooley, L.R.; McCampbell, M.R.; Thompson, J.D.
Title: Use plan for demonstration radioactive-waste incinerator
Corporate Source: Maryland Univ., Baltimore (USA)
Publication Date: Apr 1982 p 93
Report Number(s): EGG-2192
Order Number: DE82019407
Contract Number (DOE): AC07-76ID01570
Note: Portions of document are illegible
Document Type: Report
Language: English
Journal Announcement: NTS8210
Availability: NTIS, PC A05/MF A01.
Subfile: NTS (NTIS); INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: The University of Maryland at Baltimore was awarded a grant from the Department of Energy to test a specially modified incinerator to burn biomedical radioactive waste. In preparation for the incinerator, the Radiation Safety Office devised a comprehensive plan for its safe and effective use. The incinerator plan includes a discussion of regulations regarding on-site incineration of radioactive waste, plans for optimum use in burning four principal waste forms, controlled air incineration technology, and standard health physics safety practices; a use plan, including waste categorization and segregation, processing, and ash disposition; safety procedures, including personnel and area monitoring; and methods to evaluate the incinerator's effectiveness by estimating its volume reduction factors, mass and activity balances, and by determining the cost effectiveness of incineration versus commercial shallow land burial.
Major descriptors: *incinerators -- performance testing; *radioactive waste processing -- incinerators
Descriptors: combustion; cost; evaluation; materials handling; monitoring; personnel; planning; radiation protection;

regulations; safety; volume
Broader Terms: chemical reactions; management; oxidation; processing; testing; thermochemical processes; waste management; waste processing
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E51* -- Waste Treatment

Citation 235

<DIALOG File 103: >
00975940 ERA-07-056292; EDB-82-150796
Author(s): Schweitzer, D.G.; Davis, R.E.
Title: Some aspects of low-level radioactive-waste disposal in the US
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Conference Title: 14. conference on nuclear safety
Conference Location: Tokyo, Japan Conference Date: 4 Jun 1982
Publication Date: 1982 p 12
Report Number(s): BNL-NUREG-31328; CONF-8206106-2
Order Number: DE82019352
Contract Number (DOE): AC02-76CH00016
Document Type: Report; Conference literature
Language: English
Journal Announcement: INS8209
Availability: NTIS, PC A02/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts).
Country of Origin: United States
Country of Publication: United States
Abstract: This report summarizes the NRC supported Shallow Land Burial research program at Brookhaven National Laboraotry and its relationship to the proposed revised ruling on disposal of low level radioactive waste, 10 CFR Part 61. Section of the proposed regulation, which establish the new low level waste classification system and the performance objective placed on waste form, are described briefly. The report also summarizes the preliminary results obtained from the EPA program in which low level waste drums were retrieved from the Atlantic and Pacific Oceans.;
Major descriptors: *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- marine disposal; *radioactive waste disposal -- regulations; *radioactive waste disposal -- underground disposal; *US NRC -- regulations; *USA -- radioactive waste disposal
Broader Terms: management; materials; national organizations; north america; radioactive materials; radioactive wastes; US AEC; US DOE; US ERDA; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E52* -- Waste Disposal
F42 -- Safeguards & Inspection -- Nontechnical Aspects

Citation 236

<DIALOG File 103: >
00967091 EDB-82-141946
Author(s): Murray, R.L.
Title: Understanding radioactive waste
Corporate Source: Pacific Northwest Lab., Richland, WA (USA)
Publication Date: Dec 1981 p 116
Report Number(s): PNL-3570
Order Number: DE82007628

Contract Number (DOE): AC06-76RL01830
Note: Portions of document are illegible
Document Type: Report
Language: English
Journal Announcement: NTS8202
Availability: NTIS, PC A06/MF A01.
Subfile: NTS (NTIS); ERA (Energy Research Abstracts); EPA (Energy Abstracts for Policy Analysis); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: This document contains information on all aspects of radioactive wastes. Facts are presented about radioactive wastes simply, clearly and in an unbiased manner which makes the information readily accessible to the interested public. The contents are as follows: questions and concerns about wastes; atoms and chemistry; radioactivity; kinds of radiation; biological effects of radiation; radiation standards and protection; fission and fission products; the Manhattan Project; defense and development; uses of isotopes and radiation; classification of wastes; spent fuels from nuclear reactors; storage of spent fuel; reprocessing, recycling, and resources; uranium mill tailings; low-level wastes; transportation; methods of handling high-level nuclear wastes; project salt vault; multiple barrier approach; research on waste isolation; legal requirements; the national waste management program; societal aspects of radioactive wastes; perspectives; glossary; appendix A (scientific American articles); appendix B (reference material on wastes). (ATT)
Major descriptors: *radioactive waste disposal -- research programs; *radioactive wastes -- classification
Descriptors: atoms; biological effects; chemistry; engineered safety systems; fission; fission products; isotopes; legislation; low-level radioactive wastes; manhattan project; mill tailings; nuclear energy; radiations; radioactive waste management; reactors; regulations; reprocessing; salt deposits; social impact; spent fuel storage; spent fuels; transport; usa
Broader Terms: energy; energy sources; fuels; geologic deposits; isotopes; management; materials; north america; nuclear fuels; nuclear reactions; radioactive materials; radioactive wastes; reactor materials; separation processes; solid wastes; storage; tailings; waste disposal; waste management; wastes
Subject Categories: 290600* -- Energy Planning & Policy -- Nuclear Energy
052000 -- Nuclear Fuels -- Waste Management
050800 -- Nuclear Fuels -- Spent Fuels Reprocessing
055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
INIS Subject Categories: E50* -- Waste Management
B16 -- Fuel processing & reprocessing
F40 -- Safeguards & Inspection

Citation 237

<DIALOG File 103: >
00946155 INS-82-015608; EDB-82-121009
Author(s): Clark, D.E.; Colombo, P.
Title: Segregation practices in the management of low-level radioactive wastes
Corporate Source: Brookhaven National Lab., Upton, NY (USA)
Publication Date: Oct 1981 p 90
Report Number(s): BNL-51470
Order Number: DE82017233
Contract Number (DOE): AC02-76CH00016
Note: Portions of document are illegible
Document Type: Report
Language: English
Journal Announcement: ERA8207
Availability: NTIS, PC A05/MF A01.
Subfile: ERA (Energy Research Abstracts); NTS (NTIS); INS (US Atomindex input).
Country of Origin: United States
Country of Publication: United States
Abstract: A scoping study has been undertaken to determine the state-of-the-art of waste segregation technology as applied to the management of low-level waste (LLW). Present-day waste segregation practices were surveyed through a review of the recent literature and by means of personal interviews with personnel at selected facilities. Among the nuclear establishments surveyed were Department of Energy (DOE) laboratories and plants, nuclear fuel cycle plants, public and private laboratories, institutions, industrial plants, and DOE and commercially operated shallow land burial sites. These survey data were used to analyze the relationship between waste segregation practices and waste treatment/disposal processes, to assess the developmental needs for improved segregation technology, and to evaluate the costs and benefits associated with the implementation of waste segregation controls. For improved processing and disposal of LLW, it is recommended that waste segregation be practiced wherever it is technically feasible and cost-effective to do so. It is noted that LLW management practices are now undergoing rapid change such that the technology and requirements for waste segregation in the near future may differ significantly from those of the present day.
Major descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes -- sorting; *radioactive waste management -- low-level radioactive wastes
Descriptors: cost benefit analysis; nuclear facilities; surveys
Broader Terms: management; materials; radioactive materials; radioactive wastes; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 238

<DIALOG File 103: >
00880107 NTS-82-003584; ERA-07-021061; INS-82-004762; EDB-82-054949
Author(s): Heshmatpour, B.; Copeland, G.L.; Heestand, R.L.
Title: Decontamination of transuranic waste metal by melt refining
Corporate Source: Oak Ridge National Lab., TN (USA)
Publication Date: Dec 1981 p 25
Report Number(s): ORNL/TM-7951
Order Number: DE82005965
Contract Number (DOE): W-7405-ENG-26
Document Type: Report
Language: English
Journal Announcement: EDB8201
Availability: NTIS, PC A02/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: Melt refining of transuraniuc- (TRU-) contaminated metals has been proposed as a decontamination process with the potential advantages of reclaiming metal and simplifying analytical problems. The feasibility of routinely achieving the 10 nCi/g (approx. 0.1 ppM) decontamination level by melt refining will demonstrate the removing of scrap metal from the TRU waste classification. To demonstrate this feasibility, mild steel, stainless steel, nickel, and copper were contaminated with 500 ppM PuO/sub 2/ and melted with various fluxes. Four different fluxes, borosilicate glass, blast furnace slag, high silica slag, and artificial basalt, were used in these studies. The solidified slags and metals were analyzed for their plutonium contents by the use of a combination of wet chemical and ..cap alpha..-activity counting technique. Partition ratios were calculated for plutonium using the analytical results of each experiment. Some metals were doubled refined to study the effect of secondary slag treatment. The initial weight of the slags was also varied to investigate its effect on plutonium removal. The results indicated that the use of proper slags is necessary for effective removal of plutonium. All four slags were effective in removing plutonium from the metals. Values of less than 1 ppM Pu

(approx. 100 nCi/g) could be obtained in all cases. The double-refined samples were cleaned to less than 0.1 ppM Pu (approx. nCi/g), which is the goal. Variation in the slag weight did not change the results significantly. Double refining of the metal with small primary and secondary slag volume can be an effective process for removal of TRU contaminants from metals.
Major descriptors: *plutonium -- removal; *radioactive waste processing --scrap metals; *scrap metals -- decontamination
Descriptors: contamination; fractionation; melting; radioactive wastes; refining; slags; transuranium elements
Broader Terms: actinides; cleaning; elements; management; materials; metals; phase transformations; processing; radioactive materials; scrap; separation processes; solid wastes; transuranium elements; waste management; waste processing; wastes
Subject Categories: 052001* -- Nuclear Fuels -- Waste Processing
INIS Subject Categories: E51* -- Waste Treatment

Citation 239

<DIALOG File 103: >
00862948 INS-82-003564; EPA-08-001391; EDB-82-037788
Title: Seabed disposal of radioactive waste: a prime alternative
Author(s): Sonenshein, N.; Pojasek, R.B. (ed.)
Affiliation: Global Marine Development Inc., Newport Beach, CA
Title: Toxic and hazardous waste disposal. Volume 4. New and promising ultimate disposal options
Publisher: Ann Arbor Science Publishers, Inc.,Ann Arbor, MI
Publication Date: 1980 p 253-279
Document Type: Analytic of a Book
Language: English
Journal Announcement: EDB8202
Subfile: EPA (Energy Abstracts for Policy Analysis); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: Radioactive wastes have been commonly categorized as high-level (HLW), intermediate or transuranic (TRU), and low-level wastes (LLW). Recent developments in deep-sea technology such as deep-seabed drilling and emplacement, and recovery of large items of equipment make it possible to consider disposing of nuclear wastes in deep ocean sediments. The potential advantages for both HLW and LLW include remoteness from human activity, isolation capabilities of the ocean sediments, high heat-sink capacity of the oceans, the large areas available and avoidance of the problems of gaining access to adequate land sites. This thesis will be developed in this chapter by discussion of the following topics: classification of radioactive wastes; quantities of radioactive wastes; disposal techniques; deep-sea technology; seabed disposal of HLW/spent fuel; and seabed disposal of LLW/mill tailings.
Major descriptors: *barges -- design; *radioactive wastes -- classification; *radioactive wastes -- marine disposal; *ships -- design
Descriptors: mill tailings; offshore drilling; radioactive waste disposal; sediments; spent fuels
Broader Terms: drilling; energy sources; fuels; management; materials; nuclear fuels; radioactive materials; reactor materials; solid wastes; tailings; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
290600 -- Energy Planning & Policy -- Nuclear Energy
INIS Subject Categories: E52* -- Waste Disposal

Citation 240

<DIALOG File 103: >
00853083 INS-82-002211; EDB-82-027922
Title: Waste classification and methods applied to specific disposal sites
Author(s): Rogers, V.C.; Post, R.G. (ed.)
Affiliation: Ford, Bacon and Davis
Title: Waste management '79, the state of waste disposal technology and the social and political implications, proceedings of the symposium on waste management, 1979
Conference Title: Symposium on waste management and fuel cycles 1979
Conference Location: Tucson, AZ, USA Conference Date: 28 Feb 1979
Publisher: University of Arizona,Tucson, AZ
Publication Date: 1979 p 417-437
Report Number(s): CONF-790204-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8201
Subfile: INS (US Atomindex input); EI (COMPENDEX).
Country of Origin: United States
Country of Publication: United States
Abstract: An adequate definition of the classes of radioactive wastes is necessary to regulating the disposal of radioactive wastes. A classification system is proposed in which wastes are classified according to

characteristics relating to their disposal. Several specific sites are analyzed with the methodology in order to gain insights into the classification of radioactive wastes. Also presented is the analysis of ocean dumping as it applies to waste classification. 5 refs.
Major descriptors: *radioactive waste disposal; *radioactive wastes -- classification
Descriptors: marine disposal
Broader Terms: management; materials; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 241

<DIALOG File 103: >
00852995 AIX-12-596849; ERA-07-013869; EDB-82-027834
Title: Radioactive wastes. Term. Waste categories
Corporate Source: Magyar Szabvanyuegyi Hivatal, Budapest
Publication Date: 1980 p 13
Report Number(s): MSZ-14344/1-80
Document Type: Report; Standard/specification
Language: Hungarian
Journal Announcement: EDB8104
Availability: NTIS (US Sales Only), PC A04/MF A01.
Subfile: ERA (Energy Research Abstracts); AIX (non-US Atomindex input).
Country of Origin: Hungary
Country of Publication: Hungary
Abstract: The Standard determines the terms and categories of radioactive wastes originating from the application of radioactive isotopes and operation of nuclear reactors and non-energetic nuclear power plants. The terms of dosimetry, the classification of different radioactive sources (open an sealed sources, etc.), the danger classes of isotopes, the categorization of isotope laboratories (A-, B-, and C-level) are given. The waste categories, the minimal concentration and total activity values for qualifying any solid, liquid, biological or gaslike material as radioactive waste, a table for the most important isotopes, and another for unknown isotope compositions, the categories of liquid and gaslike radioactive wastes are also given.
Major descriptors: *radioactive wastes -- classification
Descriptors: hungary; specifications; standardization
Broader Terms: developing countries; eastern europe; europe; materials; radioactive materials; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 242

<DIALOG File 103: >
00835788 INS-82-000233; ERA-07-006848; EDB-82-010625
Author(s): Barna, B.A.; Reinhardt, W.W.
Title: Nondestructive characterization of low-level transuranic waste
Corporate Source: EG and G Idaho, Inc., Idaho Falls (USA)
Publication Date: Oct 1981 p 35
Report Number(s): EGG-FM-5563
Order Number: DE82002255
Contract Number (DOE): AC07-76ID01570
Document Type: Report
Language: English
Journal Announcement: EDB8111
Availability: NTIS, PC A03/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The use of nondestructive evaluation (NDE) methods is proposed for characterization of transuranic (TRU) waste stored at the Radioactive Waste Management Complex. These NDE methods include real-time x-ray radiography, real-time neutron radiography, x-ray and neutron computed tomography, thermal imaging, container weighing, visual examination, and acoustic measurements. An integrated NDE system is proposed for characterization and certification of TRU waste destined for eventual shipment to the Waste Isolation Pilot Plant in New Mexico. Methods for automating both the classification waste and control of a complete nondestructive evaluation/nondestructive assay system are presented. Feasibility testing of the different NDE methods, including real-time x-ray radiography, and development of automated waste classification techniques are covered as part of a five year effort designed to yield a production waste characterization system.
Major descriptors: *alpha-bearing wastes -- classification; *alpha-bearing wastes -- nondestructive analysis; *low-level radioactive wastes -- non-destructive analysis
Descriptors: acoustic measurements; automation; containers; evaluation; neutron radiography; radioactive waste disposal; tomography; weight measurement; x-ray radiography
Broader Terms: chemical analysis; diagnostic techniques; industrial radiography; management; materials; radioactive materials; radioactive wastes; waste disposal; waste management; wastes

Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055001 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Technical Aspects
400100 -- Analytical & Separations Chemistry
INIS Subject Categories: E52* -- Waste Disposal

Citation 243

<DIALOG File 103: >
00776808 ERA-81-025109; INS-81-011993; EDB-81-085071
Title: Low-level radioactive waste modeling needs from the USNRC perspective
Author(s): Smith, R.D.; Hawkins, E.F.; Little, C.A.; Stratton, L.E. (comps.)
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Modeling and low-level waste management: an interagency workshop
Corporate Source: Oak Ridge National Lab., TN (USA)
Conference Title: Symposium on modeling and low-level waste management
Conference Location: Denver, CO, USA Conference Date: 1 Dec 1980
Publication Date: 1980 p 31-39
Report Number(s): CONF-801217-
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8107
Availability: NTIS, PC A17/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The NRC is developing a low-level waste regulation to be issued for public comment by April 30, 1981. Publication of the final rule and final EIS is expected in 1982. This regulation, 10 CFR Part 61 will apply only to near surface disposal. Two basic approaches have been considered in developing specific regulations: a prescriptive approach and a performance objective approach. To accomplish the licensing and regulation of low-level waste disposal facilities, the information that will be needed and the methodologies to be used to assess performances are being established. Regulatory guides will cover site selection and characterization, facility design and operations, waste classification, waste form performance, site closure, post-operational surveillance, funding and monitoring. In developing licensing review procedures, initial efforts are to establish analytical modeling capabilities. We are establishing our modeling needs, determining models availability, obtaining potentially useful models and adopting those that meet our needs. As a test case, the Barnwell facility will be modeled and its performance assessed. Our analyses will then be compared with those of our contractor, ORNL and the Licensee.
Major descriptors: *radioactive waste disposal -- low-level radioactive wastes; *radioactive waste disposal -- regulations; *radioactive waste disposal -- underground disposal; *radioactive waste facilities -- design; *radioactive waste facilities -- evaluation; *radioactive waste facilities -- performance
Descriptors: geologic deposits; licensing; mathematical models; monitoring; operation; US NRC
Broader Terms: management; materials; national organizations; nuclear facilities; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055002 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability -- Nontechnical Aspects
INIS Subject Categories: E52* -- Waste Disposal

Citation 244

<DIALOG File 103: >
00735993 INS-81-005480; EDB-81-044249
Title: Overview of management of medium level wastes
Author(s): Claes, J. (SCK/CEN, Mol, Belgium); Brodersen, K.; Simon, R.; Orlowski, S. (eds.)
Title: Radioactive waste management and disposal
Conference Title: 1. European community conference
Conference Location: Luxembourg, Luxembourg Conference Date: 20 May 1980
Publisher: Harwood Academic Publishers,New York, NY
Publication Date: 1980 p 279-301
Report Number(s): EUR-6871; CONF-8005143-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8104
Subfile: INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: Belgium
Country of Publication: United States
Abstract: Medium or intermediate level wastes are generated in different steps of the nuclear fuel cycle, mainly in nuclear power stations and the storage and reprocessing of spent fuel. Definitions and arisings of MLW are summarized in the paper. The actual state of the art, with respect to conditioning processes for MLW and the development of matrix materials, is reviewed. The importance of mechanical, physical, chemical and radiological properties of the final waste products as well as the need for further efforts on characterization are

underlined. The actual management concepts for conditioned MLW have not been worked out completely and clearly, due to the fact that national policies with regard to final disposal have still to be decided in most European countries. Most of the MLW strategies therefore concentrate on intermediate storage in engineered structures, which are described in the paper. The possible options for final disposal are summarized, referring to experimental disposal operations and geological disposal projects under development in different countries. Actual R and D on MLW separation and minimization is reviewed. Its value in the proper management of MLW is underlined.
Major descriptors: *european communities -- radioactive waste management; * intermediate-level radioactive wastes -- classification; *radioactive waste disposal -- ground disposal; *radioactive waste disposal -- marine disposal; *radioactive waste management -- intermediate-level radioactive wastes; *radioactive waste processing -- solidification
Descriptors: bitumens; cements; chemical properties; geologic deposits; government policies; mechanical properties; physical properties; reviews; salt deposits
Broader Terms: building materials; document types; geologic deposits; international organizations; management; materials; organic compounds; other organic compounds; phase transformations; pollutants; processing; radioactive materials; radioactive wastes; tar; waste disposal; waste management; waste processing; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
052001 -- Nuclear Fuels -- Waste Processing
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E50* -- Waste Management
E51 -- Waste Treatment
E52 -- Waste Disposal

Citation 245

<DIALOG File 103: >
00722978 AIX-11-545170; EDB-81-031232
Title: Definition of waste arising from reprocessing
Corporate Source: INFCE (France)
Publication Date: May 1978 p 1
Report Number(s): INFCE/DEP/WG-4/54
Document Type: Report
Language: English
Journal Announcement: EDB8008
Availability: NTIS (US Sales Only), PC A02/MF A01.
Subfile: AIX (non-US Atomindex input).
Country of Origin: France
Country of Publication: International Atomic Energy Agency (IAEA)
Abstract: This paper explains that the waste arising from the reprocessing of irradiated reactor fuels can be divided into highly active liquid waste, medium level waste and low level waste depending on the level of radioactivity present. A detailed specification is given of highly active liquid waste.
Major descriptors: *fuel reprocessing plants -- radioactive wastes; *radioactive wastes -- classification
Descriptors: reprocessing; spent fuels
Broader Terms: energy sources; fuels; materials; nuclear facilities; nuclear fuels; pollutants; radioactive materials; reactor materials; separation processes; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
050800 -- Nuclear Fuels -- Spent Fuels Reprocessing
INIS Subject Categories: F12* -- Fuel Cycle Economics

Citation 246

<DIALOG File 103: >
00688145 AIX-11-523234; EDB-80-127675
Title: Wastes arising from nuclear power plants
Author(s): Rometsch, R. (National Cooperative for the Storage of Radioactive Waste, Head Office, Baden (Switzerland))
Title: Compte rendu du colloque sur la gestion des dechets en provenance des reacteurs de puissance sur le site de la centrale. Zurich, 26-30 Mars 1979
Conference Title: AECD-IAEA symposium on the on-site management of power reactor
Conference Location: Zurich, Switzerland Conference Date: 26 Mar 1979
Publisher: OECD,Paris, France
Publication Date: 1979 p 21-30
Report Number(s): CONF-790374-
Document Type: Analytic of a Book; Conference literature
Language: English
Journal Announcement: EDB8006
Subfile: AIX (non-US Atomindex input).
Country of Origin: Switzerland
Country of Publication: Nuclear Energy Agency of the OECD (NEA)
Abstract: The origin of radioactive wastes arising during normal operation of nuclear power plants is described.

Average quantities per year are given for light water reactors and compared with those of other reactor types. Waste classification and waste composition are briefly discussed.
Major descriptors: *bwr type reactors -- radioactive wastes; *pwr type reactors -- radioactive wastes
Descriptors: comparative evaluations; waste management
Broader Terms: management; materials; radioactive materials; reactors; wastes; water cooled reactors; water moderated reactors
Subject Categories: 210100* -- Power Reactors, Nonbreeding, Light-Water Moderated, Boiling Water Cooled
210200 -- Power Reactors, Nonbreeding, Light-Water Moderated, Nonboiling Water Cooled
INIS Subject Categories: E50* -- Waste Management

Citation 247

<DIALOG File 103: >
00687434 AIX-11-528099; EDB-80-126964
Title: Acceptable residual activity levels allowing waste to be considered inactive
Author(s): Chapuis, A.M.; Jacquemin, M. (CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Inst. de Protection et de Surete Nucleaire)
Title: Decommissioning of nuclear facilities
Conference Title: International symposium on the decommissioning of nuclear facilities
Conference Location: Vienna, Austria Conference Date: 13 Nov 1978
Publisher: IAEA,Vienna, Austria
Publication Date: 1979 p 285-296
Report Number(s): CONF-781180-; STI/PUB-500; IAEA-SM-234/31
Document Type: Analytic of a Book; Conference literature; Numerical data
Language: French
Journal Announcement: EDB8006
Subfile: AIX (non-US Atomindex input).
Country of Origin: France
Country of Publication: International Atomic Energy Agency (IAEA)
Abstract: The dismantling of nuclear facilities will in the course of a few decades give rise to large amounts of activated or contaminated solid waste, a large part of which will in fact have only a very low level of activity. The authors propose residual activity limits below which this type of waste could be disposed of as ordinary waste, which means that the scrap metal could be sold for melting down or the broken concrete could be used as filling material. The proposed limits are defined with reference to permissible concentrations of contaminants in air and in water and in terms of external exposure. Their application would have perfectly acceptable consequences for individuals and the population as a whole.
Major descriptors: *radioactive wastes -- classification
Descriptors: contamination; dose limits; evaluated data; maximum permissible activity; nuclear facilities; reactor decommissioning; recommendations; theoretical data
Broader Terms: data; decommissioning; information; materials; numerical data; radioactive materials; safety standards; standards; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: C53* -- Radiation Protection Standards

Citation 248

<DIALOG File 103: >
00660895 AIX-11-538738; EDB-80-100421
Title: Proposal of threshold levels for the definition of non-radioactive wastes
Author(s): Yoshida, Y. (Japan Atomic Energy Research Inst., Tokai, Ibaraki. Tokai Research Establishment)
Source: Kogai To Taisaku (Japan) v 15:5. Coden: KOTTA
Publication Date: May 1979 p 677-681
Document Type: Journal Article
Language: Japanese
Journal Announcement: EDB8007
Subfile: AIX (non-US Atomindex input).
Country of Origin: Japan
Abstract: With increasing amounts of radioactive wastes along with the advances of nuclear power generation and radioactive material utilizations, the needs for management cost reduction and resource saving have arisen. Under the situation, the threshold levels for the definition of non-radioactive solid wastes are required. The problem has been studied by an ad hoc committee in Nuclear Safety Research Association, by the request of the Science and Technology Agency. The matters described are the procedures of deriving the threshold levels, the feasibility studies of the management of waste threshold-level with several enterprises, and future subjects of study. The threshold levels are grouped in two, i.e. the unconditional level and the conditional level. According to the unconditional threshold level, solid wastes are separated definitely into radioactive and non-radioactive ones. According to the conditional threshold level, under certain conditions, some radioactive solid wastes according to the unconditional level are regarded as non-radioactive ones.
Major descriptors: *radioactive wastes -- classification
Descriptors: japan; nuclear facilities; radiation doses; radiation protection; radioactive waste disposal; radioactive waste processing; safety standards; solid wastes

Broader Terms: asia; doses; management; processing; radioactive materials; standards; waste disposal; waste management; waste processing; wastes
Subject Categories: 050200* -- Nuclear Fuels -- Exploration -- (-1987)
INIS Subject Categories: E51* -- Waste Treatment

Citation 249

<DIALOG File 103: >
00630930 EDB-80-070454
Title: Determination of the radioactivity categories in liquid wastes
Author(s): Rodionova, L.F.
Affiliation: Leningrad Scientific Research Inst. of Radiation Hygiene, USSR (In Russian)
Source: Gig. Sanit. (USSR) v 2. Coden: GISAA
Publication Date: Feb 1978 p 107-108
Document Type: Journal Article
Language: Russian
Journal Announcement: EDB8006
Subfile: NTS (NTIS).
Country of Origin: USSR
Abstract: As a rule, radioactive wastes were not segregated by the levels of their radioactivity. A point has been made of the fact that various countries approached this problem completely randomly, designating different values for the low, medium, and high levels of radioactive wastes. It has been recommended to use the international standard No. 101 to 170 in setting up a new set of regulations for radioactive wastes. 2 references.
Major descriptors: *radioactive waste management -- international cooperation; *radioactive wastes -- classification
Descriptors: international regulations; liquid wastes; standards
Broader Terms: cooperation; management; radioactive materials; regulations; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management

Citation 250

<DIALOG File 103: >
00625423 INS-80-008468; ERA-05-023751; EDB-80-064947
Author(s): Kniazewycz, B.G.
Title: Transuranic contaminated waste functional definition and implementation
Corporate Source: TERA Corp., Berkeley, CA (USA)
Publication Date: Mar 1980 p 157
Report Number(s): UCRL-15229
Contract Number (DOE): W-7405-ENG-48
Document Type: Report; Numerical data
Language: English
Journal Announcement: EDB8006
Availability: Dep. NTIS, PC A08/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The purpose of this report is to examine the problem(s) of TRU waste classification and to document the development of an easy-to-apply standard(s) to determine whether or not this waste package should be emplaced in a geologic repository for final disposition. Transuranic wastes are especially significant because they have long half-lives and some are rather radiotoxic. Transuranic radionuclides are primarily produced by single or multiple neutron capture by U-238 in fuel elements during the operation of a nuclear reactor. Reprocessing of spent fuel elements attempts to remove plutonium, but since the separation is not complete, the resulting high-activity liquids still contain some plutonium as well as other transuranics. Likewise, transuranic contamination of low-activity wastes also occurs when the transuranic materials are handled or processed, which is primarily at federal facilities involved in R and D and nuclear weapons production. Transuranics are persistent in the environment and, as a general rule, are strongly retained by soils. They are not easily transported through most food chains, although some reconcentration does take place in the aquatic food chain. They pose no special biological hazard to humans upon ingestion because they are weakly absorbed from the gastrointestional tract. A greater hazard results from inhalation since they behave like normal dust and fractionate accordingly.
Major descriptors: *high-level radioactive wastes -- classification; *radioactive waste management -- high-level radioactive wastes; *radioactive waste management -- transuranium elements; *transuranium elements -- radioactive waste management
Descriptors: adsorption; air; biological half-life; data compilation; flowsheets; food chains; ground water; health hazards; inhalation; inventories; plutonium; radioactivity; soils; tables; toxicity; uranium 238
Broader Terms: actinide isotopes; actinide nuclei; actinides; alpha decay radioisotopes; data; data forms; diagrams; elements; even-even nuclei; fluids; gases; hazards; heavy nuclei; hydrogen compounds; information; intake; isotopes; management; metals; nuclei; numerical data; oxygen compounds; radioactive materials; radioactive wastes; radioisotopes; sorption; transuranium elements; uranium isotopes; waste management; wastes;

water; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 251

<DIALOG File 103: >
00620849 INS-80-007823; EDB-80-060373
Title: Disposal classification of low-level radioactive waste
Author(s): Adam, J.A.; Watson, J.E. (ed.)
Affiliation: Nuclear Regulatory Commission, Washington, DC
Title: Low-level radioactive waste management
Corporate Source: Environmental Protection Agency, Washington, DC (USA). Office of Radiation Programs
Conference Title: 12. Health Physics Society midyear topical symposium
Conference Location: Williamsburg, VA, USA Conference Date: 12 Feb 1979
Publication Date: May 1979 p 214-218
Report Number(s): PB-296947; EPA-520/3-79-002; CONF-790209-
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8005
Availability: NTIS, PC A99/MF A01.
Subfile: INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: A system for classifying radioactive wastes is presented. This system is based on the minimum requirements for safe disposal. Study guidelines for this project are discussed. Two types of pathways are investigated: onsite reclaimer events and offsite migration. The classification system postulates 5 classes of terrestrial disposal. These are discussed. (DC)
Major descriptors: *low-level radioactive wastes -- classification; *radioactive waste disposal -- low-level radioactive wastes
Descriptors: ground disposal; ground release; ground water; radionuclide migration; safety; underground disposal
Broader Terms: environmental transport; hydrogen compounds; management; mass transfer; oxygen compounds; radioactive materials; radioactive wastes; waste disposal; waste management; wastes; water
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 252

<DIALOG File 103: >
00599739 AIX-10-463765; ERA-05-014938; EDB-80-039262
Author(s): Sousselier, Y.
Title: Radioactive wastes, current questions. Radioactive wastes and their management
Corporate Source: UKAEA Risley Nuclear Power Development Labs.
Publication Date: 1978 p 12
Report Number(s): RISLEY-Trans-3999
Document Type: Report
Language: English
Journal Announcement: EDB7907
Availability: British Library Lending Division, Boston Spa.
Subfile: ERA (Energy Research Abstracts); AIX (non-US Atomindex input).
Country of Origin: United Kingdom
Country of Publication: United Kingdom
Abstract: The subject is treated under the following headings: usable wastes and by-products; origin of radioactive waste; classification of waste and basic characteristics; principles of waste management (practical rules for management, quantity of radioactive waste, development of waste management, present and future safety of waste management).
Major descriptors: *radioactive waste management -- reviews
Descriptors: radioactive wastes
Broader Terms: document types; management; radioactive materials; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 253

<DIALOG File 103: >
00583569 AIX-10-485260; EDB-80-023091
Title: Decommissioning of nuclear facilities. Report on the international symposium held in Vienna from 13 to 17 November 1978
Author(s): Schneider, K.J. (International Atomic Energy Agency, Vienna (Austria))

Source: At. Energy Rev. (International Atomic Energy Agency (IAEA)) v 17:1. Coden: AERVA
Publication Date: Mar 1979 p 193-205
Document Type: Journal Article
Language: English
Journal Announcement: EDB8001
Subfile: AIX (non-US Atomindex input).
Country of Origin: International Atomic Energy Agency (IAEA)
Abstract: The Symposium was jointly sponsored by OECD/NEA and IAEA and was attended by more than 225 participants from 26 countries. Forty one papers were presented in eight sessions which covered the following topics: national and international policies and planning; engineering considerations relevant to decommissioning; radiological release considerations and waste classifications; decommissioning experience; and decontamination and remote operations. In addition, a panel of decommissioning experts discussed questions from the participants.
Major descriptors: *government policies -- meetings; *nuclear facilities -- government policies
Descriptors: decommissioning; planning; radiation hazards; radioactive wastes; recommendations; remote handling
Broader Terms: hazards; health hazards; radioactive materials; wastes
Subject Categories: 400702* -- Radiochemistry & Nuclear Chemistry -- Properties of Radioactive Materials
052000 -- Nuclear Fuels -- Waste Management
054000 -- Nuclear Fuels -- Health & Safety
INIS Subject Categories: F61* -- Miscellaneous -- General Relevant Documents

Citation 254

<DIALOG File 103: >
00576569 EDB-80-016091
Title: Decommissioning of nuclear facilities
Corporate Source: International Atomic Energy Agency, Vienna (Austria)
Conference Title: International symposium on the decommissioning of nuclear facilities
Conference Location: Vienna, Austria Conference Date: 13 Nov 1978
Publication Date: Jul 1979 p 706
Report Number(s): STI/PUB-500; CONF-781180-
Document Type: Report; Conference literature
Language: English
Journal Announcement: EDB8002
Availability: IAEA
Subfile: TIC (Technical Information Center).
Country of Origin: International Atomic Energy Agency (IAEA)
Country of Publication: International Atomic Energy Agency (IAEA)
Abstract: Information on the decommissioning of nuclear facilities is presented under the following main topics: policy and standards development; engineering considerations to decommissioning; radiological release considerations and waste classification;decommissioning experience; and decontamination and remote operations.
Major descriptors: *decommissioning -- meetings; *nuclear facilities -- decommissioning
Descriptors: decontamination; leading abstract; radioactive waste disposal; reactor dismantling; remote handling equipment; standards
Broader Terms: abstracts; cleaning; demolition; document types; equipment; management; materials handling equipment; waste disposal; waste management
Subject Categories: 210700* -- Nuclear Power Plants -- Regulation & Licensing
INIS Subject Categories: F22* -- Nuclear Law -- Nuclear Installations

Citation 255

<DIALOG File 103: >
00569865 INS-80-000651; EDB-80-009387
Author(s): Rogers, V.C.; Baird, R.D.; Robertson, B.C.; Macbeth, P.J.
Title: Radioactive waste disposal classification system. Volume 2. The computer program and groundwater migration models
Corporate Source: Ford, Bacon and Davis Utah, Inc., Salt Lake City (USA)
Publication Date: Sep 1979 p 57
Report Number(s): NUREG/CR-1005(Vol.2)
Document Type: Report
Language: English
Journal Announcement: EDB8001
Availability: NTIS.
Subfile: INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission, as part of its development of regulations for the disposal of radioactive waste, has contracted for the development of a radioactive classification system. A five category system, based on requirements for safe disposal, has been proposed. A computer program which calculates the Disposal Concentration Guides for individual isotopes for each category was prepared. The program allows

parameters for the isotopes and condition of the disposal to be varied. A description of the equations representing the potential exposure mechanisms is also provided.
Major descriptors: *computer codes -- c codes; *radioactive wastes -- classification
Descriptors: radioactive waste disposal
Broader Terms: computer codes; management; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 256

<DIALOG File 103: >
00569864 INS-80-000650; EDB-80-009386
Author(s): Rogers, V.C.
Title: Radioactive waste disposal classification system
Corporate Source: Ford, Bacon and Davis Utah, Inc., Salt Lake City (USA)
Publication Date: Sep 1979 p 62
Report Number(s): NUREG/CR-1005(Vol.1)
Document Type: Report
Language: English
Journal Announcement: EDB8001
Availability: NTIS.
Subfile: INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission, as part of its development of regulations for the disposal of radioactive waste, has contracted for the development of a radioactive waste classification system. The need for removing the waste from man's environment increases as the potential for endangering the health and safety of the public increases. The classification system being proposed is based on the requirements for safe disposal. The steps which were followed are: define safe, determine the pathways through the environment, formulate categories for the classification system and recommend disposal concentration guides for each category. The proposed categories are based on the length of administrative controls, the accessability of the waste and the hydrologic conditions. 13 figures, 6 tables.
Major descriptors: *radioactive waste disposal -- classification; *radioactive wastes -- classification
Descriptors: radiation doses; risk assessment; safety
Broader Terms: doses; management; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 257

<DIALOG File 103: >
00480115 INS-79-008939; ERA-04-032683; EDB-79-054214
Title: Classifying transuranic waste
Author(s): Adam, J.A. (Nuclear Regulatory Commission, Washington, DC); Rogers, V.C.
Conference Title: 1978 winter meeting of American Nuclear Society
Conference Location: Washington, DC, USA Conference Date: 12 Nov 1978
Source: Trans. Am. Nucl. Soc. (United States) v 30. Coden: TANSA
Publication Date: 1978 p 125-126
Report Number(s): CONF-7811109-
Document Type: Journal Article; Conference literature
Language: English
Journal Announcement: EDB7903
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Abstract: None;
Major descriptors: *radioactive wastes -- classification
Descriptors: maximum acceptable contamination; radioactive waste disposal; transuranium elements
Broader Terms: contamination regulations; elements; management; radioactive materials; regulations; safety standards; standards; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 258

<DIALOG File 103: >
00473597 ERA-04-025670; INS-79-007610; EDB-79-047696
Author(s): Adam, J.A.; Rogers, V.L.
Title: A classification system for radioactive waste disposal - what waste goes where. Status report on waste classification 1 October 1977--31 May 1978
Corporate Source: Ford, Bacon and Davis Utah, Inc., Salt Lake City (USA)

Publication Date: Jul 1978 p 429
Report Number(s): PB-284234; FBDU-224-10
Contract Number (DOE): NRC-02-77-077
Document Type: Report
Language: English
Journal Announcement: EDB7810
Availability: NTIS PC A19/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); NTS (NTIS).
Country of Origin: United States
Country of Publication: United States
Abstract: The Nuclear Regulatory Commission is developing a Radioactive Waste Disposal Classification System appropriate for use in the regulation of radioactive waste disposal. The purpose of developing this system is to classify the radioactive wastes according to the type and duration of containment required for their safe disposal. Potential impacts from two reference disposal methods representative of a three-category classification system are estimated using a consistent set of radionuclide release pathways. The estimated impacts are compared to the study dose guidelines in order to determine maximum allowable concentrations of isotopes appropriate for the waste categories. In general, postulated events in which individuals encounter the contaminated wastes provide the concentration limits for the waste categories.
Major descriptors: *radioactive wastes -- classification
Descriptors: management; planning; radioactive waste disposal; US NRC
Broader Terms: management; national organizations; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 259

<DIALOG File 103: >
00467055 ERA-04-021748; INS-79-006611; EDB-79-041154
Author(s): Cohen, J.J.; King, W.C.
Title: Determination of a radioactive waste classification system
Corporate Source: California Univ., Livermore (USA). Lawrence Livermore Lab.
Publication Date: Mar 1978 p 162
Report Number(s): UCRL-52535
Contract Number (DOE): W-7405-ENG-48
Document Type: Report
Language: English
Journal Announcement: EDB7903
Availability: Dep. NTIS, PC A08/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: Several classification systems for radioactive wastes are reviewed and a system is developed that providesguidance on disposition of the waste. The system has three classes: high-level waste (HLW), which requires complete isolation from the biosphere for extended time periods; low-level waste (LLW), which requires containment for shorter periods; and innocuous waste (essentially nonradioactive), which may be disposed of by conventional means. The LLW/innocuous waste interface was not defined in this study. Reasonably conservative analytical scenarios were used to calculate that HLW/LLW interface level which would ensure compliance with the radiological exposure guidelines of 0.5 rem/y maximum exposure for a few isolated individuals and 0.005 rem/y for large population groups. The recommended HLW/LLW interface level for /sup 239/Pu or mixed transuranic waste is 1.0 ..mu..Ci/cm/sup 3/ of waste. Levels for other radionuclides are based upon a risk equivalent to this level. A cost-benefit analysis in accordance with as low as reasonably achievable (ALARA) and National Environmental Protection Act (NEPA) guidance indicates that further reduction of this HLW/LLL interface level would entail marginal costs greater than $10/sup 8/ per man-rem of dose avoided. The environmental effects considered were limited to those involving human exposure to radioactivity.
Major descriptors: *radioactive wastes -- classification
Descriptors: cost benefit analysis; high-level radioactive wastes; low-level radioactive wastes; radiation doses; radiation hazards; radiation protection; radioactive waste disposal
Broader Terms: doses; hazards; health hazards; management; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 260

<DIALOG File 103: >
00433852 AIX-09-412166; ERA-04-003297; EDB-79-001949
Title: West Germany's efforts to close the nuclear fuel cycle: strategies for radioactive waste management
Author(s): Krugmann, H. (Princeton Univ., N.J. (USA))
Source: Int. J. Energy Res. (United Kingdom) v 2:2. Coden: IJERD

Publication Date: 1978 p 107-121
Document Type: Journal Article
Language: English
Journal Announcement: EDB7811
Subfile: ERA (Energy Research Abstracts); AIX (non-US Atomindex input). ut)
Country of Origin: United States
Abstract: West Germany's efforts to reach a mature economy by 'closing' the 'back end' of the nuclear fuel cycle are discussed with special emphasis on radioactive waste management strategies. The radioactive wastes that would be generated in a closed nuclear fuel cycle are described. A brief discussion is given of the motives that underlie the current international disagreement regarding the desirability of, and the need for, closing the nuclear fuel cycle. West Germany's concept for closing the nuclear fuel cycle is outlined including institutional arrangements and responsibilities. A discussion of radioactive waste classification follows. Expected volumes and inventories of radioactive wastes are pointed out. Current practices, and research and development work in the treatment and disposal of radioactive wastes are outlined. A final section is devoted to the history, circumstances and implications of the current for a 'solution'for the back end of the nuclear fuel cycle as a precondition for continued expansion of nuclear power in West Germany.
Major descriptors: *fuel cycle -- planning; *nuclear power plants -- fuel cycle; *nuclear power plants -- waste management; *waste management --planning
Descriptors: german federal republic; government policies; radioactive waste disposal
Broader Terms: management; nuclear facilities; power plants; thermal power plants; waste disposal; waste management
Subject Categories: 210802* -- Nuclear Power Plants -- Economics -- Fuel Cycle
052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: F12* -- Fuel Cycle Economics

Citation 261

<DIALOG File 103: >
00353979 EPA-04-001376; ERA-03-014102; INS-78-002543; GAP-78-008781; EDB-78-042607
Title: State's viewpoint on radioactive waste criteria
Author(s): Hardin, C.M.
Affiliation: Kentucky Department for Human Resources, Frankfort
Title: Workshop on policy and technical issues pertinent to the development of environmental protection criteria for radioactive wastes
Corporate Source: Environmental Protection Agency, Washington, DC (USA)
Conference Title: Workshop on policy and technical issues pertinent to the development of environmental protection criteria for radioactive wastes
Conference Location: Albuquerque, NM, USA Conference Date: 12 Apr 1977
Publication Date: 1977 p 2.31-2.35
Report Number(s): ORP/CSD-77-2; CONF-770451-
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB7802
Subfile: GAP (General and Practical); INS (US Atomindex input); ERA (Energy Research Abstracts); EPA (Energy Abstracts for Policy Analysis); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The current definition of low-level and intermediate wastes, with respect to personnel protection, but neglecting long-term environmental impacts, is not acceptable. A baseline numerical value should be fixed early for population and individual exposures from the handling, storage, and burial of radioactive wastes. One problem in shallow land burial sites is that they generally provide regional and national benefits, and only indirectly benefit the state; thus, any siting criteria must include state, regional, and national perspectives. The following recommendations are offered: waste should be segregated into treated waste and low-specific-gravity waste; categorization shouldn't be based on external exposure rates; standards should be based on leaching rate in water; perpetual care programs should be based on the biological hazards, and any new criteria developed should not be immediately applied to existing sites. (DLC);
Major descriptors: *radioactive waste disposal -- standards
Descriptors: radiation doses
Broader Terms: doses; management; waste disposal; waste management
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
055000 -- Nuclear Fuels -- Safeguards, Inspection, & Accountability
290600 -- Energy Planning & Policy -- Nuclear Energy
INIS Subject Categories: E52* -- Waste Disposal
F40 -- Safeguards & Inspection

Citation 262

<DIALOG File 103: >
00319061 NTS-78-000238; ERA-03-006078; INS-78-000057; EDB-78-007688
Title: Generic environmental assessment for implementing a radioactive waste classification system (3 category

system)
Corporate Source: Ford, Bacon and Davis Utah, Inc., Salt Lake City (USA)
Publication Date: Sep 1977 p 19
Report Number(s): UCRL-13771
Contract Number (DOE): W-7405-ENG-48
Document Type: Report
Language: English
Journal Announcement: EDB7712
Availability: Dep. NTIS, PC A02/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); NTS (NTIS); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: Potential impact on the environent, compliance with applicable water and air quality standards, cost-benefits due to the interface, unavoidable adverse effects, alternatives to the proposed action, and irreversible commitments of resources are discussed. (LK)
Major descriptors: *radioactive wastes -- classification
Descriptors: cost benefit analysis; environmental impacts; radioactive waste disposal
Broader Terms: management; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 053000* -- Nuclear Fuels -- Environmental Aspects
052002 -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: C52* -- Radiation Hazards & Safety Evaluations of Nuclear Installations
E52 -- Waste Disposal

Citation 263

<DIALOG File 103: >
00319049 NTS-78-000231; ERA-03-006067; INS-78-000051; EDB-78-007676
Title: Determination of a radioactive waste classification system. Final report (3 category system)
Corporate Source: Ford, Bacon and Davis Utah, Inc., Salt Lake City (USA)
Publication Date: Sep 1977 p 102
Report Number(s): UCRL-13770
Contract Number (DOE): W-7405-ENG-48
Document Type: Report
Language: English
Journal Announcement: EDB7712
Availability: Dep. NTIS, PC A06/MF A01.
Subfile: INS (US Atomindex input); ERA (Energy Research Abstracts); NTS (NTIS); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: A description of low-level waste disposal facilities, calculational methods for determining interface levels, results of the evaluations, formulation of waste classification system interfaces, and how to use the waste classification system are presented. Six appendices provide additional information.
Major descriptors: *radioactive wastes -- classification
Descriptors: radioactive waste disposal; radioactive waste facilities; risk assessment
Broader Terms: management; nuclear facilities; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 264

<DIALOG File 103: >
00267043 INS-77-012913; ERA-02-047798; EDB-77-105241
Title: Critical evaluation of the limit of transuranic contamination of low level waste
Author(s): Rodger, W.A.
Affiliation: Nucl Saf Assoc, Bethesda, Md
Source: AIChE Symp. Ser. (United States) v 72:154. Coden: ACSSC
Publication Date: 1976 p 33-41
Document Type: Journal Article
Language: English
Journal Announcement: EDB7707
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); EI (COMPENDEX).
Country of Origin: United States
Abstract: The suggested limit for transuranics of 10 nanocuries/gram as a break point at which wastes should go to a national repository is seriously questioned. It is shown that insofar as protection of water supplies is concerned, the key to the problem is $sup 90$Sr, not transuranics, and in any case, the limit should be based on a site-determined inventory, not on concentration. Concentration is only important as a protection for future stumblers who might dig into the waste. Calculations are presented to show that for this purpose the limit should be higher by several orders of magnitude. The 10 nanocurie/gram should be used as a definition of

complete innocuousness. 4 refs.
Major descriptors: *fuel reprocessing plants -- radioactive wastes; *nuclear power plants -- radioactive wastes; *radioactive waste disposal -- cost benefit analysis; *radioactive wastes -- classification; *solid wastes -- radioactive waste disposal; *spent fuel elements -- radioactive waste disposal
Descriptors: calculation methods; quantity ratio; strontium 90; water pollution
Broader Terms: alkaline earth isotopes; beta decay radioisotopes; beta-minus decay radioisotopes; even-even nuclei; fuel elements; intermediate mass nuclei; isotopes; management; nuclear facilities; nuclei; pollution; power plants; radioactive materials; radioisotopes; reactor components; strontium isotopes; thermal power plants; waste disposal; waste management; wastes; years living radioisotopes
Subject Categories: 052002* -- Nuclear Fuels -- Waste Disposal & Storage
INIS Subject Categories: E52* -- Waste Disposal

Citation 265

<DIALOG File 103: >
00266992 INS-77-012890; ERA-02-047758; EDB-77-105189
Author(s): King, W.C.; Cohen, J.J.
Title: Interim report to the Nuclear Regulatory Commission on radioactive waste classification
Corporate Source: California Univ., Livermore (USA). Lawrence Livermore Lab.
Publication Date: 18 Apr 1977 p 152
Report Number(s): UCID-17497
Contract Number (DOE): W-7405-ENG-48
Document Type: Report
Language: English
Journal Announcement: EDB7708
Availability: Dep. NTIS, PC A08/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: The Lawrence Livermore Laboratory assisted the Nuclear Regulatory Commission in the development of a radioactive waste classification system that will satisfy technical, environmental, and societal concerns. This is an interim report to the NRC on work accomplished to date. It describes a proposed waste-classification system that is based on the final disposition of waste material. The system consists of three classes of radioactive waste. The classification of any radioactive waste will depend primarily on its hazard potential. Other characteristics such as longevity (half-size) will be considered also. The levels of hazard that differentiate the three classes of radioactive waste will be determined by ongoing work. This report describes other work to be completed before a suitable radioactive waste-classificaion system is established.
Major descriptors: *radioactive wastes -- classification
Descriptors: radioactive waste disposal; radioactive waste management; regulations
Broader Terms: management; radioactive materials; waste disposal; waste management; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 266

<DIALOG File 103: >
00260132 INS-77-011230; ERA-02-042685; EDB-77-098255
Author(s): Bray, G.R.; Julin, S.K.
Title: Final report on the classification of radioactive wastes
Corporate Source: Science Applications, Inc., McLean, VA (USA)
Publication Date: 3 Dec 1976 p 130
Report Number(s): UCRL-13706; SAI-76-649-WA
Contract Number (DOE): W-7405-ENG-48-PO-3812603
Document Type: Report
Language: English
Journal Announcement: EDB7707
Availability: Dep. NTIS, PC A07/MF A01.
Subfile: ERA (Energy Research Abstracts); INS (US Atomindex input); TIC (Technical Information Center).
Country of Origin: United States
Country of Publication: United States
Abstract: Most of the various radioactive waste classification systems found in the literature are outlined, and details on several other classification systems proposed during the study effort are given. (LK)
Major descriptors: *radioactive wastes -- classification
Descriptors: materials handling; radioactive waste disposal; radioactive waste processing; radioactive waste storage
Broader Terms: management; processing; radioactive materials; storage; waste disposal; waste management; waste processing; waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E50* -- Waste Management

Citation 267

<DIALOG File 103: >
00197369 AIX-08-281974; EDB-77-035003
Title: Radioactive wastes
Author(s): Giraud, B. (Ministere de l'Industrie et de la Recherche, 75 - Paris (France)); Candes, P. (Ministere de l'Industrie et de la Recherche, 75 - Paris (France). Service Central de Surete des Installations Nucleaires)
Source: Ann. Mines (France) v 182:3. Coden: ANMSA
Publication Date: Mar 1976 p 45-162
Document Type: Journal Article
Language: French
Journal Announcement: EDB7703
Subfile: AIX (non-US Atomindex input).
Country of Origin: France
Abstract: A classification of radioactive wastes is proposed and an inventory of the wastes produced by the different lines is made. The possible storage solutions as well for high activity wastes (according to their characteristics) as for medium and low activity wastes are described. Finally, the problems of wastes together with dismantling of definitively shut down nuclear installations are recalled.
Major descriptors: *radioactive wastes -- classification; *radioactive wastes -- inventories
Descriptors: france; global aspects; radioactive waste disposal; radioactive waste processing; radioactive waste storage; reactor decommissioning safety
Broader Terms: decommissioning; europe; management; processing; radioactive materials; storage; waste disposal; waste management; waste processing waste storage; wastes
Subject Categories: 052000* -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E52* -- Waste Disposal

Citation 268

<DIALOG File 6: (c) 1993 NTIS>
1667743 NTIS Accession Number: NUREG/CR-5911/XAB
Source: Term Evaluation for Radioactive Low-Level Waste Disposal Performance Assessment (Technical rept)
Author: Cowgill, M. G. ; Sullivan, T. M.
Brookhaven National Lab., Upton, NY.
Corp. Source Codes: 004545000
Sponsor: Nuclear Regulatory Commission, Washington, DC. Div. of Low-Level Waste Management and Decommissioning.
Report No.: BNL-NUREG-52334
Jan 93 99p
Languages: English
Journal Announcement: GRAI9309
Also available from Supt. of Docs. See also NUREG-1418. Sponsored by
Nuclear Regulatory Commission, Washington, DC. Div. of Low-Level Waste Management and Decommissioning.
NTIS Prices: PC A05/MF A02
Country of Publication: United States
Abstract: Information compiled on the low-level radioactive waste disposed at the three currently operating commercial disposal sites during the period 1987-1989 have been reviewed and processed in order to determine the total activity distribution in terms of waste stream, waste classification andwaste form. The review identified deficiencies in the information currentlybeing recorded on shipping manifests and the development of a uniform manifest is recommended. The data from waste disposed during 1989 at one ofthe sites (Richland, WA) were more detailed than the data available during other years and at other sites, and thus were amendable to a more in-depthtreatment. This included determination of the distribution of activity foreach radionuclide by waste form, and thus enabled these data to be evaluated in terms of the specific needs for improved modeling of releases from waste packages. From the results, preliminary lists have been prepared of the isotopes which might be the most significant from the aspect of the development of a source term model.
Descriptors: *source terms; *low-level radioactive wastes; *radioactivewaste disposal; performance evaluation; washington (state); waste forms; mathematical models; radioisotopes; tables (data); containers; sorbents solidification; cements
Identifiers: Richland(Washington); Barnwell(South Carolina) Beatty (Nevada); NTISNUREG
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity); 68F (Environmental Pollution and Control--Radiation Pollution and Control)

Citation 269

<DIALOG File 6: (c) 1993 NTIS>
1534790 NTIS Accession Number: NUREG/CR-5343/XAB
Title: Radionuclide Characterization of Reactor Decommissioning Waste and Spent Fuel Assembly Hardware. Progress Report (Technical rept. 1 Oct 87-Oct 1 90)
Author: Robertson, D. E.; Thomas, C. W.; Wynhoff, N. L.; Hetzer, D. C.
Affiliation: Battelle Pacific Northwest Labs., Richland, WA.

Corp. Source Codes: 048335000
Sponsor: Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Regulatory Research.
Report No.: PNL-6806
Jan 91 104p
Languages: English
Journal Announcement: GRAI9115
Note: Also available from Supt. of Docs. Sponsored by Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Regulatory Research.
NTIS Prices: PC A06/MF A01
Country of Publication: United States
Abstract: The study is providing the NRC and licensees with a more comprehensiveand defensible data base and regulatory assessment of the radiologicalfactors associated with reactor decommissioning and disposal of wastes generated during these activities. The objectives of the study are being accomplished during a two-phase sampling, measurement, and assessment program involving the actual decommissioning of Shippingport Station and the detailed analysis of neutron-activated materials from commercial reactors. Radiological characterization studies at Shippingport have shown that neutron activation products, dominated by (60)Co, comprised the residual radionuclide inventory. Fission products and transuranic radionuclides were essentially absent. Waste classification assessmentshave shown that all decommissioning materials (except reactor pressure vessel internals) could be disposed of as Class A waste. Measurements and assessments of spent fuel assembly hardware have shown that (63)Ni, (59)Ni,and (94)Nb sometimes greatly exceed the 10 CFR 61 Class C limit for some components, and thus would require disposal in a high level waste repository. These measurements are providing the basis for an assessment of the disposal options for these types of highly radioactive materials.Comparisons of predicted (calculated) activation product concentrationswith the empirical data are providing an assessment of the accuracy of calculational methods.
Descriptors: *qualitative analysis; *reactor decommissioning *radioactive waste management; characterization; control elements shippingport reactor; cobalt 60; low-level radiactive wastes; nickel 63 nickel 59; niobium 94; chemical radiation effects; post irradiation examination
Identifiers: *Spent fuel hardwaare; *Activation products; NTIS NUREG
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity); 77E (Nuclear Science and Technology--Nuclear Instrumentation)

Citation 270

<DIALOG File 6: (c) 1993 NTIS>
1493134 NTIS Accession Number: DE90006852/XAB
Title: Standardization of radioactive waste categories. Foreign trip report, November 24-December 3, 1989
Author: Mezga, L. J.
Corporate Affiliation: Oak Ridge Gaseous Diffusion Plant, TN.
Corp. Source Codes: 021307000; 4830000
Sponsor: Department of Energy, Washington, DC.
Report No.: K/ESH/FTR-2
10 Jan 90 76p
Languages: English
Journal Announcement: GRAI9013; ERA9024
Sponsored by Department of Energy, Washington, DC.
Note: Portions of this document are illegible in microfiche products.
NTIS Prices: PC A05/MF A01
Country of Publication: United States
Contract No.: AC05-84OT21400
Abstract: The traveler participated in the consultants' meeting resulting in the development of a draft revision of Technical Reports Series No. 101''Standardization of Radioactive Waste Categories.'' This effort was based on a previous draft developed during an earlier consultants meeting. High-, intermediate- and low-level solid, gaseous, and liquid wastes are classified according to hazard and half-life based principally upon existing International Atomic Energy Agency (IAEA) classification systems. In addition to a general waste classification scheme, other factors to be considered in the management of wastes from an operational standpoint are presented. This report provides details of the visit to the IAEA, a summary of impressions, recommendations and/or conclusions concerning the United States Radioactive Waste Management Program. 18 refs., 1 fig., 12 tabs.
Descriptors: *gaseous wastes; *high-level radioactive wastes; *liquid wastes; *low-level radioactive wastes; *solid wastes; austria classification; half-life; hazards; iaea; information needs; international cooperation; radioactive waste disposal; *radioactive waste management radioactive waste storage; transport; waste forms
Identifiers: EDB/052000; NTISDE
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity)

Citation 271

<DIALOG File 6: (c) 1993 NTIS>
1404546 NTIS Accession Number: DE89011149/XAB
Title: INEL (Idaho National Energy Laboratory) Low-Level Radioactive Waste Acceptance Criteria: Revision 3
Author: Wilkinson, D. R.
Corporate Affiliation: Department of Energy, Idaho Falls, ID. Idaho Operations Office.

Corp. Source Codes: 062706001; 9512901
Sponsor:Department of Energy, Washington, DC.
Report No.: DOE/ID-10112-REV.3; MISC-89014
Mar 87 104p
Languages: English
Journal Announcement: GRAI8919; NSA1400
Portions of this document are illegible in microfiche products.
NTIS Prices: PC A06/MF A01
Country of Publication: United States
Contract No.: AC07-76ID01570
Abstract: This document delineates the criteria for: shipping low-level waste (LLW) to the Radioactive Waste Management Complex (RWMC), and shipping LLW to the Waste Experimental Reduction Facility (WERF) for metal recycling or volume reduction. General information concerning disposal of contaminated waste materials is contained in Section 1. Two categories of waste are defined in Section 2. General criteria pertaining to all waste is summarized in Section 3. Processable waste classifications are identified in Section 4. Nonprocessable, direct disposal, waste classifications are identified in Section 5. Section 6 presents a list of the required documentation that must accompany each shipment of waste. Standard containers acceptable for shipping waste to the RWMC and WERF are described in Section 7. (ERA citation 14:026322)
Descriptors: *low-level radioactive wastes; *regulations; volume classification; compliance; ground disposal; minimization; modifications *radioactive waste management; standards; transport
Identifiers: ERDA/052002; ERDA/056000; ERDA/293000; NTISDE
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity); 77F(Nuclear Science and Technology--Radiation Shielding, Protection, and Safety); 68F (Environmental Pollution and Control--Radiation Pollution and Control)

Citation 272

<DIALOG File 6: (c) 1993 NTIS>
1399867 NTIS Accession Number: DE89009737/XAB
Title: Existing LLW (Low-LevelRadioactive Waste) Treatment and Disposal Technology Offers 17-to-1 Volume Reduction and Advanced Disposal at Low Cost
Author: Darnell, G. R.; Larsen, M. M.
Corporate Affiliation: EG and G Idaho, Inc., Idaho Falls.
Corp. Source Codes: 046580000; 9507781
Sponsor: Department of Energy, Washington, DC.
Report No.: EGG-M-88429; CONF-890207-17
Date: 1989 11p
Languages: English Document Type: Conference proceeding
Journal Announcement: GRAI8917; NSA1400
Waste management '89, Tucson, AZ, USA, 26 Feb 1989.
Note: Portions of this document are illegible in microfiche products.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: AC07-76ID01570
Abstract: Existing technology was used to develop a conceptual design for a WasteTreatment and Disposal Complex (WTDC). The designed facility would treat nearly 100% of all solid low-level radioactive waste (LLW), regardless of waste classification. Approximately 95 vol% of all LLW would be delivered in reusable shipment containers to the WTDC, where treatment would produce a liquid-free, densely-compacted, 98 vol% inorganic waste. The treated waste would be packed with contaminated grout in uniform, smooth-sided, thin-walled, steel boxes. The boxesare stacked tightly in abovegrade, earth-mounded, concrete, disposal vaults, where they will be protected from water after vault closure. The 210-pound-per-cubic-foot waste prevents subsidence. Engineered earthen covers are placed over the vaults at the final closure and should keep water out of the waste long after vault degradation. A volume reduction factor of 17-to-1 is achieved through sorting, incineration, metal sizing operations, intense compaction, and grouting. The total cost for design, construction, testing, 30 years of treatment and disposal, administration, decontamination and decommissioning, site closure, and postclosure monitoring and maintenance will cost $13 per cubic for in 1988 dollars for an annual incoming-waste volume of 450,000 cubic feet. In comparison, estimates of present disposal costs range from around $20 to $113 per cubic foot. 6 figs. (ERA citation 14:024180)
Descriptors: *low-level radioactive wastes; *radioactive waste facilities; *compactors; compliance; cost estimation; evaluation; *incinerators minimization; radioactive waste disposal; radioactive waste management Regulations; Solid Wastes; Volume
Identifiers: ERDA/052001; ERDA/052002; NTISDE
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity); 77I (Nuclear Science and Technology--Reactor Fuels and Fuel Processing); 68F (Environmental Pollution and Control--Radiation Pollution and Control)

Citation 273

<DIALOG File 6:(c) 1993 NTIS>
1318090 NTIS Accession Number: TIB/B88-80675/XAB

Title: Entsorgung radioaktiver Abfaelle. Verwahrform hochaktiver Abfaelle aus der Wiederaufarbeitung. (Radioactive waste management. Waste forms of high-level radioactive wastes from reprocessing)
Author: Merz, E.
Affiliation: Gesellschaft fuer Reaktorsicherheit m.b.H., Cologne (Germany, F.R.).
Corp. Source Codes: 063610000
Report No.: GRS-66
Date: Oct 87 111p
Languages: German
Journal Announcement: GRAI8813
Note: In German, NTIS Prices: PC E11
Country of Publication: Germany, Federal Republic of
Abstract: First, some general informations are given about radioactive waste, e.g. arising of waste, classification, intermediate deposition and transport, as well as about the multi-barrier concept. Then, emphasis is laid on the internationally favoured vitrification of high active waste. Safety requirements and the physical-chemical characteristics of the waste forms are described as are the different technical vitrification processes. Moreover, alternative solidification products such as ceramic materials and synthetic rocks were discussed. In addition, the worldwide technical concepts for the management and final disposal of radioactive waste are summarized. (orig./HP). (Copyright (c) 1988 by FIZ. Citation no. 88:080675.)
Descriptors: fuel reprocessing plants; reprocessing; high-level radioactive wastes; waste forms; reviews; vitrification; containers; waste management; *radioactive waste processing; radioactive waste storage; radioactive waste disposal
Identifiers: *Foreign technology; *Waste forms; NTISTFFIZ
Section Headings: 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity)

Citation 274

<DIALOG File 6: (c) 1993 NTIS>
735584 NTIS Accession Number: NUREG/CR-1005-V-1
Title: A Radioactive Waste Disposal Classification System. Volume 1 (Final technical rept. Sep 77-Jan 79)
Author: Rogers, V. C.
Corporate Affiliation: Ford, Bacon and Davis Utah, Inc., Salt Lake City.
Corp. Source Codes: 060321000
Sponsor: Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Material Safety and Safeguards.
Date: Sep 79 65p
Languages: English
Journal Announcement: GRAI7926
See also Volume 2, NUREG/CR-1005-V-2.
NTIS Prices: PC A04/MF A01
Contract No.: NRC-02-77-197
Abstract: The Nuclear Regulatory Commission, as part of its development of regulations for the disposal of radioactive waste, has contracted for the development of a radioactive waste classification system. The need for removing the waste from man's environment increases as the potential for endangering the health and safety of the public increases. The classification system being proposed is based on the requirements for safe disposal. The proposed categories are based on the length of administrative control, the accessability of the waste and the hydrologic conditions.
Descriptors: radioactive wastes; classifications; waste disposal
Identifiers: *Radioactive waste management; Radioactive waste disposal; Radioactive waste storage; Radionuclide migration; NTISNUREG
Section Headings: 18G (Nuclear Science and Technology--Radioactive Wastes and Fission Products); 97Q* (Energy--Selected Studies In Nuclear Technology); 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity)

Citation 275

<DIALOG File 6: (c) 1993 NTIS>
665648 NTIS Accession Number: PB-284 234/2
Title: A Classification System for Radioactive Waste Disposal - What Waste Goes Where (Status rept. on waste classification 1 Oct 77-31 May 78)
Author: Adam, J. A.; Rogers, V. L.
Corporate Affiliation: Ford, Bacon and Davis Utah, Inc., Salt Lake City.
Sponsor: Nuclear Regulatory Commission, Washington, D.C. Div. of Fuel
Cycle and Material Safety.
Date: Report No.: FBDU-224-10; NUREG-0456
Date: Jul 78 429p
Journal Announcement: GRAI7821
NTIS Prices: PC A19/MF A01
Contract No.: NRC-02-77-077
Abstract: The Nuclear Regulatory Commission is developing a Radioactive Waste Disposal Classification System appropriate for use in the regulation of radioactive waste disposal. The purpose of developing this system is to classify the radioactive wastes according to the type and duration of containment required for their safe

disposal. Potential impacts from two reference disposal methods representative of a three-category classification system are estimated using a consistent set of radionuclide release pathways. The estimated impacts are compared to the study dose guidelines in order to determine maximum allowable concentrations of isotopes appropriate for the waste categories. In general, postulated events in which individuals encounter the contaminated wastes provide the concentration limits for the waste categories.
Descriptors: *radioactive waste disposal; *classifications; regulations management planning; safety; isotopes; concentration(composition) guidelines; environmental impacts; doses; sites; radioactive wastes; waste disposal
Identifiers: NTISNUREG
Section Headings: 18G (Nuclear Science and Technology--Radioactive Wastes and Fission Products); 68F* (Environmental Pollution and Control--Radiation Pollutionand Control); 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity)

Citation 276

<DIALOG File 6: (c) 1993 NTIS>
423647 NTIS Accession Number: HEDL-TME-74-50
Title: Commerical Alpha Waste Program (Quarterly progress rept. Mar-Jun 74)
Author: Cooley, C. R.
Corporate Affiliation: Hanford Engineering Development Lab., Richland, Wash.
Date: Sep 74 34p
Journal Announcement: GRAI7502
NTIS Prices: PC A03/MF A01
Contract No.: AT(45-1)-2170
Abstract: This is the first Quarterly Progress Report on the Commercial Alpha Waste Program being conducted by Hanford Engineering Development Laboratory (HEDL) for the Division of Waste Management and Transportation, USAEC. Included in this report is a description of the program and discussion on the topics of fuel fabrication waste categorization and acid digestion process development. For the purposes of this program, alpha wastes are defined as non-high level radioactive wastes containing measurable or suspected contamination from actinide elements. Specifically excluded are spent fuel cladding hulls, which are being studied at Pacific Northwest Laboratory and Argonne National Laboratory.
Descriptors: *radioactive wastes processing; *solid waste disposal
Identifiers: NTISAEC
Section Headings: 68F (Environmental Pollution and Control--Radiation Pollution and Control)

Citation 277

<DIALOG File 2: (COPR. 1993 IEE)>
04287920 INSPEC Abstract Number: A9301-2875-002
Title: Measurements of decay radioactivity of long-lived isotopes
Author(s): Kumar, A.; Abdou, M.A.; Youssef, M.Z.; Ikeda, Y.; Konno, C. Oyama, Y.; Kosako, K.; Maekawa, F.; Maekawa, H.
Author Affiliation: Sch. of Eng. & Appl. Sci., California Univ., Los Angeles, CA, USA
Journal: Fusion Technology vol.21, no.3, pt.2B p.2180-9
Publication Date: May 1992 Country of Publication: USA
CODEN: FUSTE8 ISSN: 0272-3921
U.S. Copyright Clearance Center Code: 0272-3921/92/$3.00
Conference Title: Tenth Topical Meeting on the Technology of Fusion Energy
Conference Date: 7-11 June 1992 Conference Location: Boston, MA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: Measurements of long-lived radioactivity are required to generate a reliable data-base for qualifying fusion materials for reactor applications. However, long half lives necessitate an intense 14 MeV neutron source, long irradiation time, long cooling time, and long counting time under low background. A 32 h 12 m long irradiation, at a mean source neutron intensity of 1.13*10/sup 12/ n/s, was carried out on a number of foil packages kept near a rotating neutron target source at FNS under the USDOE/JAERI collaborative program in June 1989. Four identical foil packages were kept at 0, 45, 90, and approximately 115 degrees to the d/sup +/ beam. Each package contained foils of Ag, Al, Dy, Hf, /sup 151/Eu, /sup 153/Eu, Hf, Ho, Ir, Mo, Re, Tb, and W. The objective was to measure decay gamma radioactivity from /sup 108m/Ag, /sup 26/Al, /sup 158/Tb, /sup 152/Eu, /sup 150/Eu, /sup 94/Nb, /sup 186m/Re, /sup 178m2/Hf, /sup 192m/Ir, and /sup 166m/Ho, among others. The half lives of these products range from 13.3y (/sup 152/Eu) to 0.72My (/sup 26/Al). These foils were interspersed with dosimetric foils of Nb and Zr. An estimated average fluence of approximately 0.83*10/sup 15/ n/cm/sup 2/ (range: 0.47-1.65.10/sup 15/ n/cm/sup 2/) was obtained for the foil-package at zero degrees. After cooling times ranging from 1.3 to 2 years, gamma -spectroscopy of some of these foils has been completed. Analysis of measurements, done on a foil package at zero degrees, has been carried out using four radioactivity codes, REAC-2, DKRICF, ACT4 (THIDA-2), and RACC. REAC-2 is the only code that has data for most of the observed products; RACC has data for Al, Mo and W products only. The ratio of computed to experimentally measured activities varies from 4.10/sup -5/ to 377. A major update of all four cross-section libraries is recommended as waste classification of many fusion specific materials is likely to change dramatically. (27 Refs)
Descriptors: gamma-ray spectra of liquids and solids; radioactive waste radioactivity measurement; radioisotopes

Identifiers: decay radioactivity; long-lived isotopes; /sup 108m/Ag; /sup 26/Al; /sup 158/Tb; /sup 152/Eu; /sup 150/Eu; /sup 186m/Re; /sup 178m2/Hf /sup 192m/Ir; /sup 166m/Ho; gamma -spectroscopy; REAC-2; DKRICF; ACT4; THIDA-2; RACC; /sup 94/Nb; Re; Hf; Ir; Ho
Class Codes: A2875 (Radioactive waste, transportation, disposal, storage, treatment); A2970 (Radiation measurement, detection and counting)
Chemical Indexing:
Re el (Elements - 1)
Hf el (Elements - 1)
Ir el (Elements - 1)
Ho el (Elements - 1)
Nb el (Elements - 1)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 278

<DIALOG File 2: (COPR. 1993 IEE)>
04248433 INSPEC Abstract Number: A9221-2875-008
Title: Basic problems of radiogeoecology in storing radioactive wastes
Author(s): Laverov, N.P.; Kantsel', A.V.; Lisitsin, A.K.; Omel'yanenko, B.I.; Pek, A.A.; Sel'tsov, B.M.; Filonenko, Yu.D.
Author Affiliation: Inst. of Geol. of Ore Deposits, Petrography, Miner. & Geochem., Acad. of Sci., Russia
Journal: Atomnaya Energiya vol.71, no.6 p.523-34
Publication Date: Dec. 1991 Country of Publication: Russia
CODEN: AENGAB ISSN: 0004-7163
Translated in: Soviet Atomic Energy vol.71, no.6 p.988-96
Publication Date: Dec. 1991 Country of Publication: USA
CODEN: SATEAZ ISSN: 0038-531X
U.S. Copyright Clearance Center Code: 0038-531X/91/7106-0988$12.50
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: This article covers briefly three main areas: (i) radioactive waste classification; (ii) storage of low, moderate and high level wastes and (iii) geological conditions for waste storage. (26 Refs) Descriptors: geology; radioactive waste; waste disposal identifiers: radioactive waste storage; low level waste; llw; ilw; high level waste; hlw; moderate level waste; radiogeoecology; radioactive waste classification; geological conditions class codes: a2875 (radioactive waste, transportation, disposal, storage, treatment); a2842k (radioactive wastes); a9165 (geophysical aspects of geology and mineralogy)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 279

<DIALOG File 2: (COPR. 1993 IEE)>
03684140 INSPEC Abstract Number: A90104422, C90049546
Title: An expert system for greater-than-class-C waste classification
Author(s): Williamson, D.A.
Author Affiliation: Florida Univ., Tallahassee, FL, USA
Journal: Transactions of the American Nuclear Society vol.61 p.79
Publication Date: 1990 Country of Publication: USA
CODEN: TANSAO ISSN: 0003-018X
Conference Title: 1990 Annual Meeting of the American Nuclear Society (papers in summary form only received)
Conference Date: 10-14 June 1990 Conference Location: Nashville, TN, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Greater-than-class-C (GTCC) low-level waste consists mainly of spent-fuel disassembly hardware (e.g. grid spacers, guide tubes, and end fittings) and nonfuel assembly hardware (e.g. control rods, in-core instrumentation, and neutron sources). To assist in GTCC waste disposal planning, the extent of the problem must first be determined. The hardware waste expert system has been developed to help in GTCC waste disposal planning and execution by estimating hardware waste inventories, both present and future, and suggesting packing and disposal options based on actual practices both here and abroad. A prototype was initially developed that concentrated on hardware inventory calculations for a single reactor site (Palisades) to gain familiarity with the workings of expert systems and to provide better direction for the full-scale system that would follow. The insights thus gleaned have been incorporated into the hardware waste expert system, which has been expanded to include all nuclear reactors and utilities and has further included several functions beyond the original intent of the program. (0 Refs)
Descriptors: expert systems; nuclear engineering computing; radioactive waste
Identifiers: LLW; greater-than-class-C waste classification; low-level waste; spent-fuel disassembly hardware; nonfuel assembly hardware; waste disposal planning; hardware waste inventories; disposal options; expert

systems; hardware waste expert system
Class Codes: A2875 (Radioactive waste, transportation, disposal, storage, treatment); A2841C (Computer codes); A2842K (Radioactive wastes)
C1230 (Artificial intelligence); C7470 (Nuclear engineering)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 280

<DIALOG File 2: (COPR. 1993 IEE)>
03502003 INSPEC Abstract Number: A89140166
Title: Status of spent fuel storage expansion at Prairie Island
Author(s): Kapitz, J.; McCarten, L.
Author Affiliation: Prairie Island Nucl. Generating Plant, Welch, MI, USA
Journal: JNMM vol.17, no.3 p.20-2
Publication Date: April 1989 Country of Publication: USA
ISSN: 0893-6188
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: The Prairie Island Nuclear Generating Plant contains two 560 MWe, two-loop Westinghouse designed PWRs. These two units have been in commercial operation since 1973 and 1974. The current spent fuel storage capacity will be exhausted in the 1994-1995 time frame. In 1987 Prairie Island performed a demonstration of rod consolidation technology in the spent fuel pool. The demonstration included waste classification and empty cage volume reduction. The results of this demonstration and Prairie Islands future plans for spent fuel storage expansion are discussed. (0 Refs)
Descriptors: fission reactor fuel preparation and reprocessing; radioactive waste; waste disposal
Identifiers: radioactive waste; spent nuclear fuel; Prairie Island Nuclear Generating Plant; spent fuel storage capacity; rod consolidation technology; spent fuel pool; waste classification; empty cage volume reduction
Class Codes: A2875 (Radioactive waste, transportation, disposal, storage, treatment); A2842K (Radioactive wastes); A2842H (Fuel preparation and reprocessing)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 281

<DIALOG File 2: (COPR. 1993 IEE)>
02748717 INSPEC Abstract Number: A86110752
Title: Radioactive waste storage and disposal
Author(s): Murray, R.L.
Author Affiliation: Dept. of Nucl. Eng., North Carolina State Univ., Raleigh, NC, USA
Journal: Proceedings of the IEEE vol.74, no.4 p.552-79
Publication Date: April 1986 Country of Publication: USA
CODEN: IEEPAD ISSN: 0018-9219
U.S. Copyright Clearance Center Code: 0018-9219/86/0400-0552$01.00
Language: English Document Type: Journal Paper (JP)
Treatment: Bibliography (B); General, Review (G); Practical (P)
Abstract: A review of the subject of radioactive waste management is provided, including background information, tutorial material, and a status report on US disposal efforts. Topics discussed are: the radioactive decay process; the steps in the nuclear fuel cycle from the mining of uranium to the disposal of wastes; typical uses of isotopes and radiation in which there are waste byproducts; classification of wastes according to type and origin; the nuclear industry's problem of accumulation of spent fuel temporary storage systems; transportation; reprocessing; methods of solidification of wastes; the options available for disposing of high-level wastes, including the preferred mined cavity method; the handling of low-level wastes; the purposes of monitored retrievable storage; studies on waste migration in a geologic medium via groundwater; disposal site characterization studies; and the laws and regulations that govern waste management. The need for public understanding of radioactive wastes is noted. (72 Refs)
Descriptors: materials handling; radioactive waste; waste disposal
Identifiers: waste classification; nuclear industry; legislation; radioactive waste management; radioactive decay process; nuclear fuel cycle; spent fuel; solidification of wastes; mined cavity method; low-level wastes; retrievable storage; waste migration; disposal site characterization
Class Codes: A2875 (Radioactive waste, transportation, disposal, storage, treatment)

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Citation 282

<DIALOG File 2: (COPR. 1993 IEE)>
02726979 INSPEC Abstract Number: A86098661
Title: Mixed wastes: the implications for 10CFR61 compliance
Author(s): Trinoskey, P.A.
Author Affiliation: Bechtell Nat. Inc., Oak Ridge, TN, USA
Journal: Transactions of the American Nuclear Society vol.52 p.24-6
Publication Date: 1986 Country of Publication: USA
CODEN: TANSAO ISSN: 0003-018X
Conference Title: 1986 Annual Meeting of the American Nuclear Society (papers in summary form only received)
Conference Sponsor: ANS
Conference Date: 15-19 June 1986 Conference Location: Reno, NV, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: The minimum requirements for all classes of waste to protect health and environmental systems is outlined in 10CFR61. The wastes thus disposed must not be capable of deterioration or reaction at normal temperatures or pressures of explosive reaction with water, or of generating toxic fumes, gases or vapors. The commercial waste disposal sites accepting low-level wastes further restrict the wastes to those in which the radiological hazard exceeds the chemical hazard. Records of conducting such hazards evaluations are to be maintained by the waste generator and furnished to the disposal facility on request (also presumably available to regulatory groups). In addition to these requirements, the DOT regulates the transportation of hazardous and radioactive materials, and may impose additional packaging, marking, and labeling criteria to mixed wastes shipped to a disposal facility. Currently, there is no specific criteria for packaging materials defined for mixed wastes as a waste classification. The establishment of a program to ensure that the hazard assessment is performed and that radiological wastes mixed with hazardous wastes comply with the radiological hazard greater than chemical hazard restriction will be needed by each waste generator.
Descriptors: radioactive waste; waste disposal
Identifiers: 10CFR61 compliance; deterioration; reaction; normal temperatures; pressures; explosive reaction; generating toxic fumes; gases vapors; commercial waste disposal sites; low-level wastes; radiological hazard; waste generator; disposal facility; transportation; radioactive materials
Class Codes: A2875 (Radioactive waste, transportation, disposal, storage, treatment)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 283

<DIALOG File 2: (COPR. 1993 IEE)>
02193691 INSPEC Abstract Number: A84023237
Title: The impact of 10 CFT 61 on utility radioactive waste operations
Author(s): Voit, R.E.; Motl, G.P.
Author Affiliation: NUS Process Services Corp., Columbia, SC, USA
Conference Title: Waste Management. Proceedings of the Symposium p.411-13 vol.1
Editor(s): Post, R.G.
Publisher: Univ. Arizona, Tucson, AZ, USA
Publication Date: 1983 Country of Publication: USA 2 vol.(xi+521+vii+425 pp.
Conference Sponsor: ANS
Conference Date: 27 Feb.-3 March 1983 Conference Location: Tucson, AZ, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Economic aspects (E); Practical (P)
Abstract: Although 10 CFR 61 applies primarily to the operator of waste disposal sites, it also has significant impact on the waste generator. The authors analyze the impact on waste generator operations in the following five areas: waste classification, waste packaging and shipping, package labeling, operating costs, and waste volume reduction programs. (3 Refs) Descriptors: economics; materials handling; radioactive waste; transportation; waste disposal
Identifiers: waste shipping; 10 CFT 61; utility radioactive waste operations; waste generator; waste classification; waste packaging; package labeling; operating costs; volume reduction Class Codes: A2842K (Radioactive wastes)

NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 284

<DIALOG File 2: (COPR. 1993 IEE)>
00720896 INSPEC Abstract Number: A75011367
Title: The classification of radioactive wastes
Author(s): Gera, F.
Author Affiliation: Comitato Nazionale Energia Nucleare, Rome, Italy

Journal: Health Physics vol.27, no.1 p.113-21
Publication Date: July 1974 Country of Publication: UK
CODEN: HLTPAO ISSN: 0017-9078
Language: English Document Type: Journal Paper (JP)
Treatment: General, Review (G)
Abstract: Various proposals are reviewed. It is suggested that the need for standardized waste categories could be satisfied by simply defining the meaning of the terms presently in common use. In the past, the classification of radioactive wastes has been considered necessary in order to facilitate communication, but has not been intended to provide indications on subsequent operations of treatment, conditioning, storage and disposal. In addition to a waste classification of such limited scope, it would be very advantageous to adopt a classification of an operational nature. It is suggested that the wastes should be classified and segregated on the basis of the duration of required containment. (17 Refs)
Descriptors: pollution detection and control; radiation protection; radioactive sources; reviews; waste disposal

Identifiers: classification of radioactive wastes; standardized waste categories; operations of treatment; conditioning; storage; disposal; duration of required containment
Class Codes: A8760P (Radiation protection); A8760R (Radioactive pollution); B7530B (Radiation protection and dosimetry); B7530 (Health Physics)
NOTE: We acknowledge INSPEC (Publishing and Information Services The Institute of Electrical Engineers) for their permission to use this citation and abstract. Please note that this citation and abstract is copyrighted by INSPEC.

Citation 285

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
03586147 E.I. Monthly No: EI9304051804
Title: For the solidified radioactive waste classification.
Author: Korenkov, A. P.
Source: Atomnaya Energiya v 73 n 2 Aug 1992 p 129-131
Publication Year: 1992
CODEN: AENGAB ISSN: 0004-7163
Language: Russian
Document Type: JA; (Journal Article) Treatment: A; (Applications)
Journal Announcement: 9304
Abstract: Proposal on classification of solid radioactive wastes by degree of required isolation determined by totality of such parameters as nuclide specific content in the wastes, half-decay period, rate of dissolution in water and radiotoxicity is considered. Example of determining isolation coefficient for high-level radioactive wastes of radiochemical plants and medium-level wastes at NPPs is presented. In Russian.
Descriptors: *radioactive wastes; fission products; radioactive waste disposal; gamma rays; radioactivity; solidification; solid solutions
identifiers: radioactive waste classification
Classification Codes: 622 (Radioactive Materials)
62 (NUCLEAR TECHNOLOGY)
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Citation 286

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
03417525 E.I. Monthly No: EIM9204-020556
Title: Radioactive/mixed waste problems and strategies 10CFR61 radioanalytical techniques and instrumentation mixed waste analyses and instrumentation.
Author: Banavali, Ashok D.; Stagg, Derryl D.; McCurdy, David E.; Harvey, James T.
Corporate Source: Yankee Atomic Electric Co, Westboro, MA, USA
Conference Title: Monitoring Water in the 1990's: Meeting New Challenges
Conference Location: Denver, CO, USA Conference Date: 1990 Jun 11-14
Sponsor: ASTM Committee D-19 on Water
E.I. Conference No.: 16030
Source: ASTM Special Technical Publication n 1102. Publ by ASTM, Philadelphia, PA, USA. p 124-144
Publication Year: 1991
CODEN: ASTTA8 ISSN: 0066-0558 ISBN: 0-8031-1407-9
Language: English
Document Type: PA; (Conference Paper) Treatment: A; (Applications); X (Experimental)
Journal Announcement: 9204
Abstract: On December 27, 1982, after several years of deliberation, the U.S. Nuclear Regulatory Commission (NRC) published 10CFR61 code of regulations in the Federal Register. These regulations address the disposal of low-level radioactive wastes in near surface land disposal facilities. Included in this body of regulations is the classification of radwaste that the generator has to provide the waste collector or processor. This classification is based on the radioactivity content of the shipment and constitutes Class A, Class B and Class C based on progressive increases in radioactivity. Generally Class A type samples include dry active waste material while Class B and Class C include evaporator bottoms, primary system clean-up resins, microwynd filters, crud, etc. The NRC Branch Technical position on waste classification also outlined an example program

in its recommendations that the nuclear utilities generating waste must adhere to in order to be found in compliance with waste characterization regulations. In short, it assumes a periodic isotopic analysis for all nuclides listed in Table 1 of Section 61.55, gamma spectroscopy of certain radionuclides and gross radioactivity measurements that correlate with gamma spectroscopy measurements. Waste characterization must also. (Author abstract) 15 Refs.
Descriptors: *radioactive wastes--*disposal; radioactivity--measurements evaporators; spectroscopy; nuclides--radioactive
Identifiers: gamma spectroscopy; mixed waste; radiochemical analyses; instrumentation; radioanalytical techniques
Classification Codes: 622 (Radioactive Materials); 914 (Safety Engineering); 801 (Chemical Analysis & Physical Chemistry) 62 (nuclear technology); 91 (engineering management); 80 (chemical engineering)
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Citation 287

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
02094239 E.I. Monthly No: EIM8605-033687
Title: UK strategy for radioactive waste.
Author: Matthews, P. T.
Corporate Source: Radioactive Waste Management Advisory Committee, UK
Conference Title: Radioactive Waste Management.
Conference Location: London, Engl Conference Date: 1984 Nov 27-29
Sponsor: British Nuclear Energy Soc, London, Engl; British Nuclear Forum, UK; European Nuclear Soc
E.I. Conference No.: 07824
Source: Publ by British Nuclear Energy Soc, London, Engl p 5-7
Publication Year: 1985
ISBN: 0-7277-0235-1
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8605
Abstract: A brief summary is given of the size of the problem of radioactive waste management in the U. K. A statement of the general strategy with emphasis on recent developments is presented. (Edited author abstract)
Descriptors: *industrial wastes--*radioactive materials; waste disposal-- united kingdom; nuclear power plants--wastes; risk studies--public risks; environmental protection--legislation; radioactive wastes--disposal
Identifiers: radioactive waste classification; waste inventory; radiation doses; reprocessed fuel
Classification Codes: 452 (Sewage & Industrial Wastes Treatment); 622 (Radioactive Materials); 613 (Nuclear power plants); 914 (safety engineering); 914 (safety engineering); 902 (engineering graphics & standards) 45 (pollution & sanitary engineering); 62 (nuclear technology); 61 (plant & power engineering); 91 (engineering management); 90 (general engineering)
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Citation 288

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01890173 E.I. Monthly No: EIM8509-051392
Title: Compressive strength and radiation stability of cement-encapsulated radwastes.
Author: Smeltzer, E. E.; Grant, D. C.; Skriba, M. C.; Cwynar, J. C. Eisenstatt, L. R.
Corporate Source: Westinghouse Electric Corp, Research & Development Cent, Pittsburgh, PA, USA
Conference Title: 1984 Annual Meeting - American Nuclear Society.
Conference Location: New Orleans, LA, USA Conference Date: 1984 Jun 3-7
Sponsor: ANS, La Grange Park, IL, USA
E.I. Conference No.: 05608
Source: Transactions of the American Nuclear Society v 46 1984. Publ by ANS, La Grange Park, IL, USA p 171-172
Publication Year: 1984
CODEN: TANSAO ISSN: 0003-018X
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8509
Abstract: The U. S. Nuclear Regulatory Commission (NRC) regulation 10CFR61, has established a waste classification system based on the radionuclide concentrations in the wastes. According to this classification, the more radioactive wastes (classes B and C) are required to be stabilized prior to disposal. Jar scale tests were performed on simulated wastes to develop and evaluate the cement encapsulation recipes. Using the most promising recipe, full-scale encapsulation tests were then performed. From these full-scale tests, samples were made for the waste form qualification testing as specified in the NRC Branch Technical Position-Waste Form. This paper deals with the results of two of the required qualification tests: compressive strength and radiation stability.
Descriptors: *radioactive materials--*waste disposal; nuclear fuels--reprocessing; radiation effects; ion exchange resins
Identifiers: extended abstract; compressive strength; radwaste encapsulation
Classification Codes: 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment); 621 (NuclearReactors); 711 (Electromagnetic Waves); 741 (Op tics & Optical Devices); 815 (Plastics & Polymeric Materials) 62 (nuclear technology); 45 (pollution & sanitary engineering); 71 (el ectronics & communications);

74 (optical technology); 81 (chemical process industries)
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Citation 289

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01890148 E.I. Monthly No: EIM8509-051367
Title: DATA BASE FOR 10CFR61.
Author: Miller, Alan D.; Leventhal, Leon; Naughton, Michael
Corporate Source: Impell Corp, San Francisco, CA, USA
Conference Title: 1984 Annual Meeting - American Nuclear Society.
Conference Location: New Orleans, LA, USA Conference Date: 1984 Jun 3-7
Sponsor: ANS, La Grange Park, IL, USA
E.I. Conference No.: 05608
Source: Transactions of the American Nuclear Society v 46 1984. Publ by ANS, La Grange Park, IL, USA p 146-147
Publication Year: 1984
CODEN: TANSAO ISSN: 0003-018X
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8509
Abstract: Analytical requirements imposed on nuclear utilities are reviewed. The U. S. Nuclear Regulatory Commission (NRC), under 10CFR61, now requires the classification of low-level waste into three classes, A, B, and C. Sufficient information is stated to be available on the composition in low-level waste of the radionuclides listed in 10CFR61 to evaluate the statistical validity of the data base. Sources of variations to the data base result from operational and system variability between reactors, sample source and composition, sampling methods and sample size, activity levels and mix, radiochemistry and radioassay methods.
Descriptors: *radioactive materials--*waste disposal; database systems; legislation; statistical methods
Identifiers: extended abstract; waste classification; low level radioactivity; nuclides
Classification Codes: 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment); 723 (Computer Software); 902 (Engineering Graphics & Standards); 922 (Statistical Methods) 62 (nuclear technology); 45 (pollution & sanitary engineering); 72 (computers & data processing); 90 (general engineering); 92 (engineering mathematics)
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Citation 290

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01877361 E.I. Monthly No: EIM8506-035137
Title: economic impact of 10 CFR 61: Commonwealth Edison Operational Perspective.
Author: Coley, R. F.
Corporate Source: Commonwealth Edison Co, Maywood, IL, USA
Conference Title: Waste Management '84, Proceedings of the Symposium: Waste Isolation in the US Technical Programs and Public Education. (Volume 2: Low-Level Waste, Volume Reduction Methodologies and Economics.)
Conference Location: Tucson, AZ, USA Conference Date: 1984 Mar 11-15
Sponsor: ANS, La Grange Park, IL, USA; ASME, Radwaste Systems Committee, New York, NY, USA; EPRI, Palo Alto, CA, USA; Univ of Arizona, Coll of Engineering, Tucson, AZ, USA; DOE, Washington, DC, USA
E.I. Conference No.: 06533
Source: Publ by Arizona Board of Regents, AZ, USA p 601-605
Publication Year: 1984
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8506
Abstract: The economic impact of implementing 10 CFR Part 20. 311 and the applicable sections of 10 CFR Part 61 has been analyzed. Two major influencing factors have been considered - the interpretation applied to certain information provided by the operators of shallow-land disposal sites and the attitude with which the utility company approaches implementation of the rules. The analysis considers the following five general areas of power plant operations: (1) radiochemical analysis, (2) health physics, (3) radioactive waste processing, (4) packaged radioactive waste transportation, and (5) packaged radioactive waste disposal. 5 refs.
Descriptors: *radioactive materials--*waste disposal; waste disposal--economics; nuclear fuels--waste disposal
Identifiers: low-level radioactive waste sources; waste classification; economic impact of implementation; radiochemical analysis; costs for radionuclide analysis; radioactive waste processing
Classification Codes: 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment); 901 (Engineering Profession) 62 (nuclear technology); 45 (pollution & sanitary engineering); 90 (general engineering)
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Citation 291

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01877359 E.I. Monthly No: EIM8506-035135
Title: Assessmentof the Economic Implications of 10 CFR 61 on the South Texas Project
Author: Kniazewycz, B. George; Turner, Carl M.

Corporate Source: KLM Engineering Inc
Conference Title: Waste Management '84, Proceedings of the Symposium: Waste Isolation in the US Technical Programs and Public Education. (Volume 2: Low-Level Waste, Volume Reduction Methodologies and Economics.)
Conference Location: Tucson, AZ, USA Conference Date: 1984 Mar 11-15
Sponsor: ANS, La Grange Park, IL, USA; ASME, Radwaste Systems Committee, New York, NY, USA; EPRI, Palo Alto, CA, USA; Univ of Arizona, Coll of Engineering, Tucson, AZ, USA; DOE, Washington, DC, USA
E.I. Conference No.: 06533
Source: Publ by Arizona Board of Regents, AZ, USA p 593-596
Publication Year: 1984
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8506
Abstract: The State of Texas, as an Agreement State, is developing Texas Part 45, 'Licensing Requirements for Near-Surface Land Disposal of Radioactive Waste' to implement the intent of the Nuclear Regulatory Commission's (NRC) Title 10 to the Code of Federal Regulations, Part 61 (10CFR61) 'Licensing Requirements for Land Disposal of Radioactive Waste. ' This paper addresses the potential economic impact of the proposed Texas Part 45 and 10CFR61 on the South Texas Project (STP). The Texas Department of Health is developing the proposed rulemaking Texas Part 45 pertaining to land disposal of radioactive waste, which together with proposed amendments to related portions of Texas Parts 11 and 21, provide the licensing procedures, performance objectives, and technical criteria for licensing disposal facilities.
Descriptors: *radioactive materials--*waste disposal; waste disposal--economics; nuclear energy--texas
Identifiers: near-surface land disposal of radioactive waste; waste licensing requirements; waste classification; specific radionuclide analyses; waste packaging and shipping; package labeling
Classification Codes: 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment); 901 (Engineering Profession); 621 (Nuclear Reactors); 932 (High Energy, Nuclear & Plasma Physics) 62 (nuclear technology); 45 (pollution & sanitary engineering); 90 (general engineering); 93 (engineering physics)
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Citation 292

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01877357 E.I. Monthly No: EIM8506-035133
Title: Economics of 10 CFR Part 61
Author: Johnson, Timothy C.; Tiktinsky, David H.; Lohaus, Paul H.; Roles, G. W.
Corporate Source: US Nuclear Regulatory Commission, Washington, DC, USA
Conference Title: Waste Management '84, Proceedings of the Symposium: Waste Isolation in the US Technical Programs and Public Education. (Volume 2: Low-Level Waste, Volume Reduction Methodologies and Economics.)
Conference Location: Tucson, AZ, USA Conference Date: 1984 Mar 11-15
Sponsor: ANS, La Grange Park, IL, USA; ASME, Radwaste Systems Committee, New York, NY, USA; EPRI, Palo Alto, CA, USA; Univ of Arizona, Coll of Engineering, Tucson, AZ, USA; DOE, Washington, DC, USA
E.I. Conference No.: 06533
Source: Publ by Arizona Board of Regents, AZ, USA p 585-590
Publication Year: 1984
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8506
Abstract: The NRC staff has evaluated the economic impacts of the requirements of 10 CFR Part 61. Based on our evaluation the increase in the cost of producing nuclear power will increase by about 0. 1 percent or 0. 01 mills per kilowatt hour over the next twenty years. The total cost of complying with the requirements of 10 CFR Part 61 is about 4 percent of the total estimated waste disposal costs for the next twenty years. Lastly, the increase in occupation exposure is about 1 percent of the average dose received at an average Pressurized Water Reactor (PWR) power plant and 0. 5 percent for an average Boiling Water Reactor (BWR) power plant. 3 refs.
Descriptors: *radioactive materials--*waste disposal; waste disposal--economics; nuclear reactors--waste disposal
Identifiers: waste classification; waste form requirements; nuclear power plant waste generators; non-fuel cycle waste generators; occupational exposure impacts; full-size testing cost estimates
Classification Codes: 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment); 901 (Engineering Profession); 911 (Industrial Economics); 621 (Nuclear Reactors) 62 (nuclear technology); 45 (pollution & sanitary engineering); 90 (ge neral engineering); 91 (engineering management)

Citation 293

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01862828 E.I. Monthly No: EIM8504-018781
Title: Integrated neutron and gamma nda technique for examination of ORNL TRU waste.
Author: Schultz, F. J.; Haff, K. W.; Caldwell, J. T; Close, D. A.
Kuckertz, T. H.; Kunz, W. E.; Pratt, J. C.
Corporate Source: Oak Ridge Natl Lab, Oak Ridge, TN, USA
Conference Title: Conference Summaries - Canadian Nuclear Society 4th
Annual Conference 1983.
Conference Location: Montreal, Que, Can Conference Date: 1983 Jun 15
Sponsor: Canadian Nuclear Soc, Toronto, Ont, Can

E.I. Conference No.: 05788
Source: Conference Summaries - Canadian Nuclear Society Annual Conference 4th. Publ by Canadian Nuclear Soc, Toronto, Ont, Can p 102-106
Publication Year: 1983
CODEN: CSASE4 ISSN: 0227-0129
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8504
Abstract: The Neutron Interrogation Assay System (NIAS) is a pulsed, active-neutron interrogation system and a passive neutron measurement system with the capability of detecting passive neutron totals and passive coincident neutrons and measuring passive neutron multiplicities. For waste classification an assay system utilizing the NIAS gamma-ray drum scanner has been employed. This paper describes each technique, the results obtained from examination of transuranic waste, and a brief cost/benefit study. 4 refs.
Descriptors: *radioactive materials--*analysis; nuclear fuels--reprocessing
Identifiers: abstract only; transuranic (TRU) nuclear waste; storage; assaying; Neutron Interrogation Assay System (NIAS); radionuclides
Classification Codes: 622 (Radioactive Materials); 694 (Packaging & Storing); 621 (Nuclear Reactors); 802 (Chemical Apparatus & Plants); 911 (Industrial Economics) 62 (nuclear technology); 69 (materials handling); 80 (chemical engineering); 91 (engineering management)

Citation 294

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01849574 E.I. Monthly No: EIM8501-003972
Title: Management of decommissioning waste from the Swedish nuclear program.
Author: Forsstrom, Hans
Corporate Source: Swedish Nuclear Fuel Supply Co, Div KBS, Stockholm, Swed
Conference Title: Proceedings of the 1982 International Decommissioning Symposium.
Conference Location: Seattle, WA, USA Conference Date: 1982 Oct 10-14
Sponsor: US DOE, Washington, DC, USA
E.I. Conference No.: 05327
Source: Publ by US DOE (CONF-821005), Washington, DC, USA. Available from GPO, Washington, DC, USA p III. 10-III. 20
Publication Year: 1983
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8501
Abstract: The Swedish nuclear power program includes nuclear power reactors, which will be in operation up to the year 2010. By law the responsibility for the waste management and decommissioning is given to the utilities. A charge is put on the electricity production to finance the necessary work. In order to establish this charge a decommissioning study has been performed. The results of this study also give the basis for the planning of the management of the decommissioning waste. The volumes and activities of the waste are described as well as how the waste is classified according to its final disposal. Most of the radioactive decommissioning waste will be similar to the operational waste from a radioactivity point of view. The planned disposal for this waste is described and some safety considerations are given. 9 refs.
Descriptors: *nuclear reactors--*decommissioning; radioactive materials-- waste disposal
Identifiers: waste management; swedish nuclear programs; finance; waste classification
Classification Codes: 621 (Nuclear Reactors); 622 (Radioactive Materials); 452 (Sewage & Industrial Wastes Treatment) 62 (nuclear technology); 45 (pollution & sanitary engineering)

Citation 295

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01699495 E.I. Monthly No: EIM8411-089557
Title: Overview of low-level radioactive waste management and disposal practices.
Author: Moran, Mary S.; Mezga, L. J.; Baldwin, J. S.
Corporate Source: Oak Ridge Natl Lab, Oak Ridge, Tenn, USA
Conference Title: Proceedings of the 2nd Annual Hazardous Materials Management Conference.
Conference Location: Philadelphia, Pa, USA Conference Date: 1984 Jun 5-7
Sponsor: Tower Conference Management Co, Wheaton, Ill, USA
E.I. Conference No.: 05237
Source: Proceedings of the Annual Hazardous Materials Management Conference 2nd. Publ by Tower Conference Management Co, Wheaton, Ill, USA p 653
Publication Year: 1984
CODEN: PAHCE8
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8411
Descriptors: *industrial wastes--*radioactive materials
Identifiers: hazardous waste management; low level radioactive wastes; tr ansfer of low level wastes;

transformation of low level wastes; conditionin g of low level wastes; shallow land burial; waste classification methodology; deep burial of wastes; abstract only
Classification Codes: 452 (Sewage & Industrial Wastes Treatment); 622 (Radioactive Materials); 802 (Chemical Apparatus & Plants); 914 (Safety Engineering) 45 (pollution & sanitary engineering); 62 (nuclear technology); 80 (chemical engineering); 91 (engineering management)

Citation 296

<DIALOG File 8: (c) 1993 Engineering Info. Inc.>
01440115 E.I. Monthly No: EIM8309-061991
Title: Generation, classification, treatment and disposal of solid waste forms resulting from cleanup of TMI-2.
Author: Tuite, Peter
Corporate Source: Waste Management Group Inc
Conference Title: Three Mile Island Cleanup: Experiences, Waste Disposal and Environmental Impact. (Papers presented at a symposium during the AIChE's 1981 Summer National Meeting.)
Conference Location: Detroit, Mich, USA Conference Date: 1981 Aug 16-19
Sponsor: AIChE, New York, NY, USA
E.I. Conference No.: 01792
Source: AIChE Symposium Series n 213 v 78 1982. Publ by AIChE, New York, NY, USA p 22-26
Publication Year: 1982
CODEN: ACSSCQ ISSN: 0065-8812 ISBN: 0-8169-0224-0
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8309
Descriptors: *industrial wastes--*radioactive materials
Identifiers: nuclear reactors; three mile island accident; disposal regulations; decontamination wastes; accident wastes; ion exchange wastes accident sludge; waste classification; waste treatment; evaporation concentrates
Classification Codes: 452 (Sewage & Industrial Wastes Treatment); 622 (Radioactive Materials); 621 (Nuclear Reactors); 914 (Safety Engineering); 802 (Chemi cal Apparatus & Plants) 45 (pollution & sanitary engineering); 62 (nuclear technology); 91 (engineering management); 80 (chemical engineering)

Citation 297

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
117035165 CA: 117(4)35165u JOURNAL
Activation analysis for the deuterium-helium-3 reactor ARIES-III
Author(S): Khater, H. Y.; Sawan, M. E.
Location: Fusion Technol. Inst., Univ. Wisconsin, Madison, WI, 53706-1687, USA
Journal: Fusion Technol. DATE: 1992 VOLUME: 21 NUMBER: 3, Pt. 2B PAGES: 2112-16 Coden: FUSTE8 ISSN: 0748-1896
Language: English
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Citation 298

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
116137856 CA: 116(14)137856s JOURNAL
Radioactive/mixed waste problems and strategies 10CER61 radioanalytical techniques and instrumentation mixed waste analyses and instrumentation
AUTHOR(S): Banavali, Ashok D.; Stagg, Derryl D.; McCurdy, David E.; Harvey, James T.
LOCATION: Yankee At. Electr. Co., Westboro, MA, 01581, USA
JOURNAL: ASTM Spec. Tech. Publ. DATE: 1991 VOLUME: 1102 NUMBER: Monit. Water 1990's: Meet. New Challenges PAGES: 124-44 CODEN: ASTTA8 ISSN: 00
66-0558 LANGUAGE: English
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Citation 299

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
114216469 CA: 114(22)216469e JOURNAL
Title: Advanced LLW classification system
AUTHOR(S): Yagi, T.; Yamazaki, H.; Yokota, A.; Kuribayashi, H.
LOCATION: JGC Corp., Japan,
JOURNAL: Proc. Symp. Waste Manage. DATE: 1990 NUMBER: Waste Manage. '90, Vol. 2 PAGES: 221-7 CODEN: PSWMDY ISSN: 0275-6196 LANGUAGE: English
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Citation 300

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
107085529 CA: 107(10)85529e CONFERENCE PROCEEDING
Title: Classification of radioactive materials and wastes
AUTHOR(S): Dornsife, William P.
LOCATION: Pennsylvania Dep. Environ. Resour., Bur. Radiat. Prot., Harrisburg, PA, 17120, USA
JOURNAL: Manage. Radioact. Mater. Wastes: Issues Prog., (Symp. Radioact. Mater. Wastes) EDITOR: Majumdar, Shyamal K. (Ed), Miller, E. Willard (Ed),
DATE: 1985 PAGES: 2-9 CODEN: 56BVA5 LANGUAGE: English MEETING DATE: 8
30000 PUBLISHER: Penn. Acad. Sci.,Easton, Pa
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Citation 301

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
107014037 CA: 107(2)14037g JOURNAL
Title: Classification of radioactive wastes
AUTHOR(S): Luo, Shanggeng
LOCATION: Inst. At. Energy, Beijing, Peop. Rep. China,
JOURNAL: Yuanzineng Kexue Jishu DATE: 1986 VOLUME: 20 NUMBER: 5
PAGES: 561-9 CODEN: YKJIEZ LANGUAGE: Chinese
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Citation 302

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
106127686 CA: 106(16)127686r JOURNAL
Title: Classification treatment of low-level wastes for the metallurgical industry
AUTHOR(S): Zhang, Youfang; Lin, Hecheng
LOCATION: Beijing Cent. Eng. Res. Inst. Nonferrous Metall. Ind., Beijing, Peop. Rep. China,
JOURNAL: Youkuangye DATE: 1986 VOLUME: 5 NUMBER: 3 PAGES: 26-30
CODEN: YOUKEM LANGUAGE: Chinese
SECTION: CA271011 Nuclear Technology
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Citation 303

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
95048445 CA: 95(6)48445n CONFERENCE PROCEEDING
Title: Radioactive wastes and their disposal
AUTHOR(S): Sousselier, Y.
LOCATION: CEA, Fr.
JOURNAL: Waste Disposal Other Radiat. Probl. Nucl. Ind., Proc. Int. Summer Sch. Radiat. Prot., 4th
EDITOR: Vukovic, Zivorad (Ed), DATE: 1979
PAGES: 41-7
CODEN: 45ZEAM LANGUAGE: English PUBLISHER: Boris Kidric Inst. Nucl. Sci.,Belgrade, Yugoslavia
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Citation 304

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
95012226 CA: 95(2)12226c CONFERENCE PROCEEDING
Title: Classification of cladding hulls with regard to their conditioning and disposal
AUTHOR(S): Kroth, K.; Herz, D.; Lammertz, H.; Merz, E.; Wenzel, U.
LOCATION: Inst. Chem. Technol., KFA, Juelich, D-5170, Juelich, Fed. Rep. Ger.
JOURNAL: Manage. Alpha-Contam. Wastes, Proc. Int. Symp. DATE: 1981
PAGES: 425-36 CODEN: 45NIA8 LANGUAGE: English MEETING DATE: 80
PUBLISHER: IAEA,Vienna, Austria
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Citation 305

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
87188766 CA: 87(24)188766c JOURNAL

Title: Radiation exposure standards and regulations for disposal and categorization of radioactive wastes
AUTHOR(S): Blanco, R. E.
LOCATION: Inst. Energ. At., Sao Paulo, Brazil
JOURNAL: Inf. IEA DATE: 1976 VOLUME: 53-1, PAGES: 1-29 CODEN: INIEDW
LANGUAGE: English
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Citation 306

<DIALOG File 399: (COPR. 1993 BY THE AMER. CHEM. SOC.)>
74146088 CA: 74(26)146088j TECHNICAL REPORT
Title: Standardization of radioactive-waste categories
AUTHOR(S): Rodier, Jean; Amalraj, R. V.; Yousef, V. A.; Branca, G.; Cowser, K. E.; Hedlund, R.; Perge, A.; Saidl, J.; Saiki, M.; et al.
LOCATION: Fr.
JOURNAL: Tech. Rep. Ser., Int. At. Energy Ag. DATE: 1970 NUMBER: No. 101 PAGES: 18 pp.
CODEN: TRAEA2
LANGUAGE: English
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Citation 307

<DIALOG File 399 (COPR. 1993 BY THE AMER. CHEM. SOC.)>
73059124 CA: 73(12)59124d TECHNICAL REPORT
Title: Classification of radioactive industrial wastes. I. Classification of radioactive wastes and proposal of a new classification plan for liquid and gaseous radioactive wastes
AUTHOR(S): Branca, Guido; Gera, Ferruccio
LOCATION: Lab. Ing. Sanit., CNEN, Rome, Italy
JOURNAL: Com. Naz. Energ. Nucl. DATE: 1969 NUMBER: RT/PROT(69)21
PAGES: 19 pp.
CODEN: CNENA4
LANGUAGE: Italian
AVAIL: ITALY
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Citation 308

<DIALOG File 669: (c) U.S. Govt Printing Office>
00434444
Title: Import and Export of Radioactive Wastes, Vol. 57, No. 82, 57 FR 17859
Date: Tuesday, April 28, 1992
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Proposed Rules
CFR: 10 CFR Part 110
NUMBER: RIN 3150-AD36
Note: Comment period expires July 13, 1992. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only of comments received on or before this date.
CONTACT: Ronald Hauber, Office of International Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone 301/504-2344. Mail written comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.
Deliver comments to: 11555 Rockville Pike, Rockville, Maryland, between 7:45 a.m. and 4:15 p.m. Federal workdays.
Copies of comments received may be examined at: The NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC, between 7:30 a.m. and 4:15 p.m. Federal workdays.
Proposed rule: The Nuclear Regulatory Commission (NRC) is proposing to amend its licensing requirements regarding the import and export of radioactive wastes. The proposed amendments reflect the decision of the General Conference of the International Atomic Energy Agency in September 1990 approving a voluntary Code of Practice to guide Nation States in the development and harmonization of policies and laws on the international transboundary movement of radioactive waste. The proposed amendments are intended to conform U.S. policies with these international recommendations.

WORD COUNT: 10,012
Introduction and Purpose:

The Nuclear Regulatory Commission (NRC) issued an advance notice of proposed rulemaking (ANPR) on February 7, 1990 (55 FR 4181) to solicit public comments on possible options with respect to imports and exports of radioactive waste. The ANPR was issued in the context of ongoing Commission interactions with the U.S. Department of State and other Federal agencies regarding the Commission's interest in helping to develop a broad

U.S. policy in regard to these imports and exports.

The ANPR referred to the work of the International Atomic Energy Agency (IAEA) voluntary code of practice on transboundary shipments of radioactive waste. This effort was supported by the U.S. Government. A final document was approved by the IAEA General Conference in Vienna, Austria in September 1990. A basic principle of the code of practice is that international exports of radioactive waste should take place with the prior notification and consent of the sending, receiving, and transit countries.

At present, the NRC's import and export licensing requirements are concerned primarily with nuclear proliferation controls. Radioactive materials of little or no significance with respect to national security are currently allowed to enter or leave the U.S. under general import and export licenses. Thus, currently, imports or exports of nuclear waste may take place without issuance of a specific license by the NRC and without the NRS's knowledge. By amending part 110, in the manner discussed below, to require specific licensing of such imports or exports, the NRC will be strengthening its controls over radioactive waste entering or leaving the United States.

The ANPR reflected concerns that international transfers of radioactive wastes to and from the U.S., in particular low-level radioactive wastes (LLW), should be subject to more control. The Commission sought comments from the public, industry, and other government agencies on four regulatory options and several related issues. The ANPR stated the NRC's preliminary judgment that the best approach would be to develop a policy that provides greater control and accountability over the export and import of radioactive waste. The ANPR also stated that this policy could lead to an amendment to the NRC's existing regulations in part 110 to require advance notification and/or consent for radioactive waste exports or imports. {pg 17860}

Thirty letters of comments were received in response to the ANPR. The comments addressed various aspects of the four regulatory options and thirteen associated questions. A discussion of the general comments of the low-level waste compacts, and the public comments on the four options and thirteen questions, is given below:

General Comments by Low-Level Waste Compacts

The Southeast Compact Commission offered four general comments, as follows:

1. As a matter of policy, the Commission should recognize that most low-level radioactive waste compacts have adopted a policy controlling the import and export of low-level waste to and from their respective regions. Authority to enforce restrictions has been granted by the Congress in its approval of compact legislation. The ANPR gives little recognition of this fact.

NRC Response: The authority of the low-level waste compacts (Compacts) and States is recognized in the proposed rule. The NRC would coordinate its import licensing actions closely with interested Compacts and States. An NRC import license would not be issued in a particular case unless there were a disposal facility willing and able to receive it, including having the necessary authorization from State-level officials. Neither Compacts nor States have any authority over exports of low-level radioactive waste from the United States although they may have authority to bar such waste from leaving their respective regions or jurisdictions. 2. The NRC must provide specific notice of any approved, impending imports and exports to all low-level Compacts which may be impacted. The portal State should also be notified of such shipments.

NRC Response: The NRC will inform interested Compacts and States prior to issuing a license to authorize the import or export of radioactive waste. However, the proposed rule does not place reporting requirements on shippers with regard to notifying the NRC of the actual route and schedule of each authorized import or export of radioactive waste. The Compacts and States might be able to place their own reporting requirements on shippers. In the case of imports, such reporting requirements might be imposed as a condition of authorizing a disposal facility to receive the shipper's material.

3. It is believed that Congress did not contemplate the foreign importation or exportation of waste that would violate a Compact's expressed desires to deny such domestic importation from or exportation to another region of this country.

NRC Response: The NRC believes the proposed rule complies with Congressional requirements and respects the role and authority of the Compacts and States with respect to low-level radioactive waste. It does not preempt the authority of the Compacts or States to control the movement of low-level waste into or out of a regional or State facility.

4. Because the imported and exported material may have low economic value and might be abandoned in the event of an accident, appropriate financial assurance must be obtained for these wastes.

NRC Response: The proposed rule does not establish any special requirements for financial assurances as a condition for the NRC issuing an import or export license. The NRC staff believes it would be difficult to justify requiring financial assurances for waste shipments when assurances are not required for other shipments of radioactive materials which have low economic value. However, the Commission's decision criteria for licensing imports or exports of radioactive waste include a determination of whether or not the proposed import or export would minimize public health, safety, and environmental impacts in the U.S. and the global commons. This criterion could lead to an examination of the shipper's qualifications and past performance in light of the potential risks to the public and the environment. Moreover, the NRC will consult with State officials and the Department of State will consult with foreign officials to identify concerns in particular cases and allow

those officials or others to require special financial assurances, outside the specific framework of the NRC's import-export regulations.

The Central Midwest Interstate Low-Level Radioactive Waste Commission, in addition to several specific comments on the options, noted:

1. Policies adopted by the NRC must allow the Compact commissions to exercise their authority over low-level waste disposed of in their regions.

NRC Response: The NRC agrees, as discussed above and as reflected in the proposed rule.

2. The public must be confident that their health and safety is being protected by an agency (NRC) that places the burden of proof on industry to demonstrate that imports or exports will not pose a threat to them.

NRC Response: The NRC believes its proposed rule should be helpful in assuring public confidence in this regard.

3. The NRC's regulations should contain explicit statements acknowledging that compliance with federal regulations is necessary, but not sufficient. The NRC should explicitly recognize the authority granted to the Compacts by the Low-Level Radioactive Waste Policy Amendments Act to control ''imports and exports'' of waste across their regional boundaries.

NRC Response: The introduction to the proposed rule states that the NRC's import/export licensing authority only controls the entry or exit of the radioactive waste into or out of the jurisdiction of the United States. It does not authorize possession of the materials nor does it in anyway assure access to a disposal facility or preempt the authority of the Compacts or States in respect to the movement of radioactive waste into or out of a region or State.

The Pennsylvania Department of Environmental Resources, with particular reference to the Appalachian States Compact, observed:

1. No low-level radioactive waste may be imported or exported into the Compact region for disposal at the regional facility without authorization as provided by law.

NRC Response: The proposed rule does not preempt the authority of the Compacts or States to control the movement of low-level waste into or out of a region or State.

2. When the Appalachian States disposal facility begins operation in Pennsylvania, the import or export of any low-level radioactive waste for disposal purposes is effectively banned. Any exception would have to be approved by the Compact commission and/or the legislature of the host State.

NRC Response: The proposed rule does not preempt the authority of the Compacts or States to control the movement of low-level waste into or out of a region or State.

Public Comments on the Four Options and Thirteen Questions

Option 1: Maintain the status quo.

Several commenters preferred Option 1. They said a need for change is not evident; any proposed rulemaking would be based on conjecture about potential future problems; the Compacts are able to restrict transfers in and out of their regions; and if there is any inconsistency in the regulation of domestic- and foreign-origin waste disposal, the regulations governing domestic possession and use could be modified. (pg 17661)

Others opposed Option 1 because this option does not provide adequate control, is not appropriate in view of international concern about extraterritorial waste dumping, and does not keep the NRC informed about waste exports and imports.

The NRC carefully considered the comment that regional Compact restrictions on waste moving in or out of the Compact obviated the need for additional NRC import and export controls on radioactive wastes. However, the NRC concluded that neither these restrictions, nor conditions placed on materials licenses by the NRC or the Agreement States, effectively control exports or imports of wastes under the general licenses in Part 110.

Overall, Option 1 does not ensure that the Commission would be informed of radioactive waste exports from the U.S. or of imports into this country and does not provide the degree of control and international consultation recommended by the IAEA Code of Practice.

Option 2: Notification of the NRC.

One commenter favored this option, if any change is needed. Two supported this option in combination with Options 3 (specific licensing) and 4 (international agreements).

Several commenters opposed this option; some because it would be too restrictive or burdensome; others because

it would be ineffective or would offer an insufficient degree of control.

The Department of State commented that this option, by itself, is not appropriate in view of international concerns. The NRC believes that a notification-only option is insufficient in regard to assuring adequate government control to allay worldwide concerns about waste dumping and conform with the IAEA Code of Practice.

Option 3: Require specific licenses to import or export radioactive waste.

One commenter opposed Option 3. This commenter believed that it is unnecessary to control waste imports to the U.S. because of the import provisions of the Low-Level Radioactive Waste Policy Amendments Act and current requirements for obtaining site use permtis and for identifying waste generators at the current disposal sites. The commenter said acknowledgement of the receiving country may be useful to prevent an inappropriate export of waste but that this is possible without licensing. One commenter observed that Option 3 demands trust in the NRC to administer the program and that the public may not trust the NRC to assure that foreign ''BRC'' (below regulatory concern) wastes will not end up in municipal landfills or incinerators in the U.S.

Several commenters supported Option 3 either alone or combined with Option 4. Option 3 was generally recognized as ensuring effective control, yet providing some flexibility. One commenter supported Option 3 because the licensing process allows possible public participation which would be unavailable under Option 4. Another commenter said Option 3 would provide for host State control over waste disposal and appropriate review by the affected Compact commission.

The Department of State preferred Option 3, noting that it should ensure, through advance notice of proposed waste imports and exports, the opportunity to control these transactions based on the consent of the importing country. The NRC also favors Option 3. The NRC would eliminate the use of existing general licenses under part 110 for radioactive waste exports and imports except to return sealed sources and other materials to the country of origin to a consignee who is authorized to possess them.

Option 4: Ban imports and exports of radioactive waste except under international disposal agreements.

Comments were about equally divided on this option. Supporters generally favored combining it with Option 3 (specific licensing) to achieve adequate control over imports and exports. One commenter suggested using this combination to ensure that exported wastes do not reappear as contaminated scrap. Those opposing Option 4 thought this option could be inflexible and difficult to implement. One commenter said that there may be little opportunity for public participation and litigation in connection with international agreements negotiated by the Department of State.

The Department of State said there had been no documentation of a waste dumping problem sufficient to justify expending substantial resources developing and negotiating a potentially complex set of agreements with prospective importing countries. The NRC agrees with the Department of State that it is not necessary to require formal agreements with other countries in order to determine the receiving government's acceptance of a proposed shipment of radioactive waste. This can be done by the Department of State in consultation with the receiving government prior to the NRC's issuance of an export license.

Question 1: What are the economic advantages and disadvantages to the import and export of radioactive wastes?

The responses to this question emphasized the current uncertainties about the number, location, and capacity of domestic disposal sites now being planned, as well as uncertainties in the future domestic demand for storage at those sites, cost factors, etc. The NRC agrees that there are a large number of unknowns and that requiring specific NRC licenses for radioactive waste imports and exports will help ensure that all relevant considerations can be taken into account at the time each licensing decision is made.

Question 2: Are there policy, health and safety, or economic disadvantages to denying import or export of certain radioactive wastes, e.g., interference with ongoing U.S. international trade in sealed sources and gauges used in medical or other applications?

Three public interest groups expressed the view that the NRC should not be concerned with economic disadvantages but should limit its concern to public health and safety and the environment. Several commenters (source suppliers and States) recognized an economic disadvantage for U.S. source suppliers if they are not allowed to take back used sources because the sale of a source is often conditioned on later return of the source for disposal. One commenter said that if return of used sources was prohibited by import restrictions, U.S. suppliers would set up foreign companies with a possible negative economic impact on the U.S. One State official commented that on a case-by-case basis there may be health and safety advantages or disadvantages to denying import or export of certain wastes. Others noted that medical sources or instruments, although perhaps a small part of the possible volume of exports and imports of radioactive waste, produced benefits which may offset the environmental cost of disposal. Another commenter believes that waste imports and exports should be minimized, with approvals granted only when necessary to protect the public health and safety and the environment.

The NRC believes that the return of used or depleted sealed sources, gauges, and similar items to the U.S. or to another original exporting country for reconditioning, recycling or disposal may be appropriate for a number of reasons, but especially to help ensure that such materials are handled responsibly and not left in dispersed and perhaps unregulated locations around the world.

Question 3: Would it be in the interest of U.S. foreign policy to assist certain countries with the disposal of their radioactive wastes? (pg 17862)

Commenters acknowledged that foreign governments might appreciate any assistance the U.S. could give them on waste disposal, but that the U.S. should provide help on policies, regulations, and institutions for handling wastes, rather than agree to import their waste when we have not solved our own problems in this area.

The NRC believes that specific licensing of low-level radioactive waste (LLW) exports and imports, as contemplated in the proposed rule, will allow important foreign policy considerations to enter into the decision process, but that these considerations would not supersede primary U.S. domestic interests.

Question 4: Does the U.S. have an adequate mechanism to dispose of imported radioactive wastes without adversely impacting the disposal of domestically generated wastes?

Commenters noted that the U.S. has not yet demonstrated its ability to handle disposal of domestic waste under the siting process defined in the Low-Level Radioactive Waste Policy Amendments Act (LLRWPAA) of 1985. The commenters identified other uncertainties which made the impact of any foreign waste imports difficult to judge. One commenter noted that the intent of Congress under the LLRWPAA was to make the States responsible for their own wastes, not imported wastes. An operator of a disposal site commented that current requirements for site use permits and identification of generators ensure appropriate approvals by State regulatory agencies before wastes are imported for disposal and obviate the need for additional regulation of imports of waste into the U.S.

The NRC believes the answer to this question depends largely on the success of the LLRWPAA's siting process.

Question 5: Would imported radioactive wastes be similar to radioactive wastes generated in the U.S. and therefore not likely to result in new radiological and/or environmental problems?

Commenters were not sure of the nature of foreign waste, but some assumed it would be similar to U.S. waste. There was some concern that imported waste could differ and that control at the generator's facilities could be a problem. There was a view that an accountable agency providing third party inspections would be essential to ensure that foreign waste streams meet Federal and importing States' specific requirements.

The NRC agrees that a verification system would need to be in place to assure that imported wastes meet U.S. standards. Existing mechanisms could be used for this purpose.

Question 6: What are the views of operators of disposal facilities and State and local governments on the import of radioactive wastes?

The one site operator who responded to the question said the NRC had implied in the ANPR that a Compact site might be required to accept foreign waste unless a change is made in part 110. However, the operator noted that a Compact has the authority to deny access to any out-of- Compact generator, including foreign ones. Several State agencies said that imports should only take place under exceptional circumstances on a case-by-case basis when the environment and public health and safety are at risk.

State agencies, as well as the one local government official that responded to the question, expected that local governments would oppose imports, probably at least into the 21st Century. A regional Compact official stressed his view that Congress did not contemplate foreign imports and exports that would violate a Compact's expressed desires to deny domestic (inter-Compact) imports and exports. The official said that if any foreign imports or exports are approved, specific notice should be given to portal States and impacted Compacts, and financial assurances should be provided to cover accidents.
The NRC notes that neither this question nor any others in the ANPR were intended to show a predisposition to approve radioactive waste imports without regard to the acceptability of the proposed actions to interested States and Compacts. Also, the NRC emphasizes that its exercise of import and export control at the borders of the U.S. is independent of the control which the States and Compacts may possess over radioactive waste while it is in the U.S.

Question 7: Are national authorities in countries that might receive U.S.-exported wastes technically competent to dispose of these wastes and would they agree to its receipt?

Commenters recognized that countries differ widely in their technical competencies, with the major nuclear power-producing countries generally most advanced in waste handling technology. Some commenters said that if any countries are willing to receive U.S.-exported waste, the U.S. should ensure that these host countries have the technical and other competence necessary to handle the waste safely.

The NRC believes that any waste exports should be confined to countries which are willing to receive them and which have regulated waste disposal programs. The NRC knows of no countries currently willing to receive our wastes.

Question 8: Should the capability of a recipient country to manage and dispose of radioactive wastes safely be considered in any NRC export license review process, recognizing that NRC authority to deny a license on these grounds is questionable?

Most commenters favored consideration of the capability of the receiving country in order to protect populations and the environment from incompetent disposal activities, as well as for moral and economic reasons. One commenter stated that criteria should be developed and implemented to evaluate host country capabilities prior to licensing. Another suggested that international agreements be used to provide the legal authority for the NRC to consider the capability of the host country.

Among the licensing criteria which the NRC would apply to its review of proposed radioactive waste exports are two which are relevant to this question. The NRC would consider the extent to which the proposed export would minimize public health, safety, and environmental impacts in the U.S. and the global commons. The NRC would also consider whether or not the proposed export would be acceptable to the competent regulatory authority of the receiving country. The NRC does not contemplate any circumstances in which a license would be issued to export to a country without a regulated waste disposal program or to a country whose government is opposed to receiving the waste.

Question 9: Would the export of some or all categories of radioactive wastes help solve a significant problem in the U.S., such as limited available disposal capacity?

Commenters noted that export of radioactive waste might be seen as the solution to the problem of developing low-level waste disposal sites but, unless all U.S. wastes were to be exported, would drive up the cost of disposing of whatever low-level wastes remained for domestic disposal and thus would serve as an economic disincentive to development of new sites.

The NRC agrees that exporting waste may cause more problems than it solves and should only be licensed when a case is made in support of a particular proposal. Any shortage of U.S. disposal capacity would only be a short-term condition.

Question 10: The NRC cannot currently regulate Naturally Occurring (pg 17863) or Accelerator Produced Material. Are provisions needed for the import and export of these wastes, assuming the NRC were given statutory authority over these materials?

Commenters seemed to favor the NRC regulation (and LLW Compact disposal) of accelerator-produced wastes, but were less sure with respect to naturally-occurring wastes such as pipe scale and gypsum piles which might be best left unregulated by the NRC.

As indicated in the question itself, the scope of the NRC's authority is not decided by the NRC but is set by law. At present the NRC does not have regulatory authority over naturally occurring and accelerator-produced wastes.

Question 11: Are there other means to broaden the Commission's information base with regard to transactions of exports and imports of radioactive wastes, exclusive of requiring specific licenses or otherwise revising the NRC's existing regulations?

Commenters suggested that international agencies or diplomatic channels might provide transaction information or that the U.S. might conduct a survey of radioactive materials brokers, processors, and site operators in the U.S. Another suggestion was to require licensees to keep records for NRC review or to submit an annual report to the NRC on waste types, volumes, activities, and destinations.

The NRC appreciates the suggestions which were offered, but has opted for specific licensing as a means of increasing its cognizance and control with respect to radioactive waste imports and exports.

Question 12: What import/export controls and licensing criteria may be necessary for various categories of radioactive waste and under what circumstances should imports and exports be considered wastes?

This broad question produced extensive comments covering the whole spectrum of options. One public interest group opposed NRC controls and asked for a complete ban. Others urged minimization of radioactive waste imports and exports, supporting only those actions necessary to protect health and safety and the environment, but also allowing the return of sealed radiation sources to the manufacturer. One said the NRC should use specific licensing to control international trade in sealed sources and to ban the import of low-level waste generated by the nuclear fuel cycle. Another said the NRC should ban specific waste forms, allowing the return of spent sealed sources to the manufacturer but not directly to a disposal facility except when such a prohibition of this type would have a detrimental impact on the environment or public health and safety in the U.S. or abroad and when no other safe alternative exists. Another commenter stated that the NRC's system of regulations, license conditions, and definitions should be used for the rest of the world and that the Resource Conservation and Recovery Act requirements could be used to ensure proper identification and characterization of mixed wastes. Others said that wastes should be accompanied by specific manifests and there should be legal certifications by receivers that they have the authority to accept the waste shipments and wish to accept them. Another said it could be useful for the receiving country to acknowledge the acceptability of the waste import before the export is authorized. The Department of State recommended that it obtain written consent of the recipient country and ask the country to confirm receipt of the import when it occurs. The Department of State also said that the NRC's rulemaking should exclude:

(a) Waste imports and exports in support of U.S. Government waste research and development testing programs

under international arrangements,

(b) Military shipments that the U.S. Government makes to itself, between foreign and domestic bases, pursuant to arrangements with another country, and

(c) Shipments made pursuant to other arrangements concluded between the U.S. and the other governments providing entry and transit through the other nation (e.g., the 1944 Convention on International Civil Aviation).

The NRC accepted several of the suggestions in developing the definitions, exceptions, procedures, and licensing criteria presented in this proposed rulemaking. Regarding the Department of State/Executive Branch recommendations:

(a) International research and development shipments would be excluded from any new requirements because the shipped waste is being sent for research purposes, not just for disposal

(b) Military and other U.S. Government shipments involving the return of radioactive waste to the U.S. (to an authorized Federal facility) would be excluded; and

(c) Nothing in the proposed new requirements would effect entry and transit rights under international shipping conventions.

Question 13: What assurances can be made that the Below Regulatory Concern (BRC) policies of various countries are consistent so that radioactive wastes declared to be BRC in the exporting country are indeed BRC wastes in the recipient country?

Several commenters expressed objections to Below Regulatory Concern as a regulatory concept or policy. One said that the problem is best solved by minimizing import and export of radioactive wastes and addressing BRC by specific international agreement when necessary and prior to import or export activity. Another said that BRC policy for imports should be the same as U.S. domestic BRC policy. Yet another commenter observed that it is not clear why a generator of BRC wastes would wish to export them.

The NRC has made no special provision for BRC material in its proposed rule. Future BRC determinations by the Commission may or may not be applied to waste imports and exports under part 110, depending on how they are formulated and on Commission policy at that time.

Overview of the Proposed Rule

The proposed rule would require a person to file an application for a specific license to export or import radioactive waste. The applicant would be required to include information on the volume of wastes, the waste classification, its chemical and physical characteristics, and whether a disposal site operator had agreed to accept the waste. A notice of receipt of each application would be published in the Federal Register . The views of the Executive Branch would be requested from the Department of State on proposed exports, and time would be available for NRC consultations with other Federal agencies and interested States and low-level waste Compacts on proposed imports. The NRC would have exclusive jurisdiction for granting or denying all licenses.

The NRC review would be governed by the following criteria: Would a proposed export or import minimize public health, safety, and environmental impacts in the United States and the global commons? Would a proposed export be acceptable to the competent regulatory authority of the receiving country? And would a proposed export be inimical to the common defense and security interests of the United States? Following its review, the NRC would recommend to the Commission approval or denial of the license. If the Commission approved the issuance of an import or export license, such license would only authorize the waste material to enter or exit the jurisdiction of the {pg 17864} United States. The NRC import or export license alone would not authorize possession of the material and would not guarantee access to a disposal site in the U.S. Or another country. In the case of waste imports, the NRC would consult with interested States and low-level waste Compacts prior to issuing an import license and generally would not grant a license unless it was clear that the waste would be accepted by a disposal site and its host State and Compact.

Environmental Impact: Categorical Exclusion

The NRC has determined that pursuant to Secs. 51.10 and 51.22(c)(1) of this chapter, these proposed amendments to part 110 require neither an environmental impact statement nor an environmental assessment.

Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the paperwork requirements.

The public reporting burden for this collection of information is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden,

to the Information and Records Management Branch (MNBB- 7714), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-3019, (3150-0036 and 3150-0027) Office of Management and Budget, Washington, DC 20503.

Regulatory Analysis

Existing NRC regulations provide strong regulatory control over the export of strategic nuclear material from a national security (nonproliferation) standpoint, but provide much less control over non-strategic nuclear materials. Many such non-strategic imports and exports qualify for general licenses without specific review or approval by the NRC. (Domestic regulations in the U.S. and abroad, and international transportation regulations, provide the primary regulatory controls for health and safety and environmental protection purposes.) In fact, the Commission has taken the position in the Philippine Reactor Export Case, and in several materials export licensing cases, that its consideration of health, safety, and environmental impacts of an export is confined to those that affect the territory of the U.S. or the global commons and that the NRC is without jurisdiction to consider impacts upon the citizens of recipient nations. This position was upheld by the U.S. Court of Appeals for the District of Columbia Circuit in NRDC v. NRC, 647 F.2nd 1345 (D.C. Cir. 1981). Executive Order 12114, however, calls for concise environmental reviews by the Executive Branch of any exported reactor or nuclear waste management facility.

National and worldwide concerns about radioactive waste disposal practices have brought attention to the limited focus of the NRC's import and export regulations and the fact that certain types and quantities of radioactive materials, including possible shipments of low-level wastes, may be imported or exported without specific authorization by the NRC and without the NRC's knowledge. The voluntary international Code of Practice on the International Transboundary Movement of Radioactive Waste, which was approved by the IAEA General Conference in 1990 with strong U.S. Government support, provides that exports and international shipments of radioactive wastes which take place only with the prior notification and consent of the sending, receiving, and transit countries. The proposed changes in the NRC's regulations in Part 110 would serve to bring the U.S. into line with these international recommendations. To the NRC's knowledge, there is no appreciable U.S. import or export traffic in radioactive waste. A possible exception, depending on one's definition of radioactive waste, would be the widely accepted practice, usually rooted in a sales or leasing contract or other agreement, of returning depleted sealed radioactive sources, used gauges, and other instruments containing radioactive materials, and similar medical and industrial items, to the original supplier- manufacturer for recycle or disposal. This practice is generally encouraged by governmental authorities as a way of helping to ensure that the items are handled in a responsible manner at the end of their useful life. By exempting these return shipments from new import or export controls, the NRC believes the proposed regulatory changes involve no significant cost to U.S. companies, the medical community, or other entities which provide or use nuclear equipment and materials. The changes could affect waste management companies interested in receiving low-level waste imports from other countries. At present low-level imports would be generally licensed under part 110. Under the proposed changes, the imports would require specific import licenses from the NRC and might not satisfy the licensing criteria. However, it is not clear whether this licensing requirement would impose any more difficult obstacle to a prospective waste importer than would the authority given the States and low-level waste Compacts under the LLRWPAA to block shipments of LLW into their respective jurisdictions.

Finally, it is noted that legislation to implement the Basel Convention on the Control of Transboundary Movements of Hazardous Waste (1989) may establish an interface in the regulatory import-export control regimes of the Environmental Protection Agency (EPA) and the NRC. That legislation may exempt from the EPA's control regime radioactive waste imports and exports controlled by the NRC in its implementation of the IAEA voluntary Code of Practice on Transboundary Movement of Radioactive Wastes.

In this sense, the alternative to the proposed changes to the NRC's regulations contained in this rulemaking is not to maintain the status quo but, arguably, some form of EPA control.

Overall, the NRC believes that requiring specific NRC licensing of U.S. waste imports and exports is a sound regulatory approach to help ensure that the transactions are subject to approval of the U.S. Government and the consent of other involved parties. This approach will bring the NRC's regulations in line with the recently-adopted IAEA voluntary Code of Practice. The following points influenced the NRC's position on this matter:

A. Only Option 1 of the ANPR, i.e., to continue the use of existing regulations, would not require rulemaking and this option is not acceptable if additional control over imports and exports of radioactive wastes is to be achieved.

B. The international community, including the United States, is committed to establishing a regime to ensure that waste imports and exports do not take place without the consent of the sending, receiving, and transit countries.

C. Specific licensing of radioactive waste exports and imports is a practical means of extending NRC cognizance and control over these transactions while also allowing for consultations and coordination with Executive Branch, State, and local authorities, as {pg 17865} appropriate. Formal Executive Branch coordination would require the Department of State to determine if each proposed radioactive waste export from the United States is acceptable to the government of the receiving country.

D. Sealed sources (and other shipments of source, byproduct, and special nuclear material currently exported or imported under NRC part 110 general licenses) should be allowed to return to a consignee in the country of origin who is authorized to possess them, without need for a specific import or export license from the NRC, in order to avoid undue disruption of commercial activities that embody desirable waste-takeback features.

The proposed rule would ensure that the NRC regulates imported, foreign-generated waste in a manner consistent with the NRC's regulation of domestically-generated waste. By requiring a specific import license from the NRC, the proposed rule would ensure that NRC regulatory requirements would be applicable to any imported radioactive waste resulting from any foreign nuclear operation that, if operated domestically, would be subject to the NRC's licensing jurisdiction. Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule will not, if promulgated, have a significant economic impact on a substantial number of small entities. The new licensing requirements for radioactive waste specifically exclude from additional controls the return of U.S.-origin sealed sources by foreign customers, which is the principal type of existing commercial activity which otherwise might have been adversely affected. In all, the proposed amendments of the general licenses contained in part 110 are expected to result in fewer than ten new export and import licenses per year.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this proposed rule, and, therefore, a backfit analysis is not required.

List of Subjects in 10 CFR Part 110

Administrative practice and procedure, Classified information, Criminal penalties, Export, Import, Incorporation by reference, Intergovernmental relations, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements, Scientific equipment.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 552 and 553, the NRC is adopting the following amendments to 10 CFR part 110.

PART 110-EXPORT AND IMPORT OF NUCLEAR EQUIPMENT AND MATERIAL

1. The authority citation for part 110 continues to read:

Authority: Secs. 51, 53, 54, 57, 63, 64, 65, 81, 82, 103, 104, 109, 111, 126, 127, 128, 129, 161, 181, 182, 183, 187, 189, 68 Stat. 929, 930, 931, 932, 933, 936, 937, 948, 953, 954, 955, 956, as amended (42 U.S.C. 2071, 2073, 2074, 2077, 2092-2095, 2111, 2112, 2133, 2134, 2139, 2139a, 2141, 2154- 2158, 2201, 2231-2233, 2237, 2239); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

Section 110.1(b)(2) also issued under Pub. L. 96-92, 93 Stat. 710 (22 U.S.C. 2403), Sec. 110.11 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152) and secs. 54c and 57d., 88 Stat. 473, 475, (42 U.S.C. 2074). Section 110.27 also issued under sec. 309(a), Pub. L. 99-440. Section 110.50(b)(3) also issued under sec. 123, 92 Stat. 142 (42 U.S.C. 2153). Section 110.51 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234); Section 110.52 also issued under sec. 186, 68 Stat. 955 (42 U.S.C. 2236). Sections 110.80-110.113 also issued under 5 U.S.C. 552, 554. Sections 110.30-110.35 also issued under 5 U.S.C. 553.

For purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), Secs. 110.20-110.29, 110.50, Secs. 110.120-110.129 also issued under secs. 161b. and i; 68 Stat. 948, 949, as amended (42 U.S.C. 2201(b) and (i)); and Sec. 110.7b. as issued under sec. 161i, 68 Stat. 949, as amended (42 U.S.C. 2201(i) and Secs. 110.7a and 110.53 are also issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. Section 110.2 is amended to add the terms country of origin and radioactive waste to read as follows:
Sec. 110.2 Definitions.

As used in this part,

Country of origin means the country which has previously exported specified radioactive materials to another country.

Radioactive waste means any material that contains or is contaminated with source material, special nuclear material or byproduct material, for which no use is foreseen, and any other imported radioactive material resulting from any foreign nuclear operation that, if operated in the United States, would be subject to the NRC's licensing authority, and for which no use is foreseen.

3. In Sec. 110.21, the introductory text of paragraphs (a) and (b) are revised, and a new paragraph (c) is added to read as follows: Sec. 110.21 Export of special nuclear material.

(a) Except as provided in paragraph (c) of this section, a general license is issued to any person to export

the following to any country not listed in Sec. 110.28:

(b) Except as provided in paragraph (c) of this section, a general license is issued to any person to export the following to any country not listed in Sec. 110.28 or Sec. 110.29:

(c) The general licenses in paragraphs (a) and (b) in this section do not authorize the export of special nuclear material in radioactive waste, other than special nuclear material in radioactive waste that is being returned to the country of origin to a consignee who is authorized by such country to possess the material.

4. In Sec. 110.22, paragraph (a) introductory text, and paragraphs (b) and (c) are revised and a new paragraph (d) is added to read as follows: Sec. 110.22 Export of source material.

(a) Except as provided in paragraph (d) of this section, a general license is issued to any person to export the following to any country not listed in Sec. 110.28:

(b) Except as provided in paragraph (d) of this section, a general license is issued to any person to export uranium or thorium in individual shipments of 10 kilograms or less to any country not listed in Sec. 110.28 or Sec. 110.29. A person may not export more than 1,000 kilograms per year to any one country.

(c) Except as provided in paragraph (d) of this section, a general license is issued to any person to export uranium or thorium in individual shipments of 1 kilogram or less to any country listed in Sec. 110.29. A person may not export more than 100 kilograms per year to any one country.

(d) The general licenses in paragraphs (a), (b), and (c) of this section do not authorize the export of source material in radioactive waste, other than source material in radioactive waste that is being returned to the country of origin to a consignee who is authorized by such country to possess the material.

5. In Sec. 110.23, the introductory text of paragraphs (a) and (b), and paragraph {pg 17866} (c) are revised and a new paragraph (d) is added to read as follows:
Sec. 110.23 Export of byproduct material.

(a) Except as provided in paragraph (d) of this section, a general license is issued to any person to export the following to any country not listed in Sec. 110.28:

(b) Except as provided in paragraph (d) of this section, a general license is issued to any person to export americium-241 to any country not listed in Sec. 110.28, except that exports of americium-241 exceeding 1 curie per shipment or 100 curies per year to any country listed in Sec. 110.29:

(c) Except as provided in paragraph (d) of this section, a general license is issued to any person to export bulk, undispersed tritium in individual shipments of 100 curies or less to any country not listed in Sec. 110.28 or Sec. 110.29. No person may export more than 10,000 curies per year to any one country.

(d) The general licenses in paragraphs (a), (b), and (c) of this section do not authorize the export of byproduct material in radioactive waste, other than byproduct material in radioactive waste that is being returned to the country of origin to a consignee who is authorized by such country to possess the material.

6. In Sec. 110.27, paragraph (b) is revised to read as follows: Sec. 110.27 Imports.

(b) The general license in paragraph (a) of this section does not authorize the import of source or special nuclear material in the form of irradiated fuel that exceeds 100 kilograms per shipment or the import of radioactive waste, other than radioactive waste that is being returned to the United States to a consignee who is authorized by the NRC or an NRC Agreement State to possess the material or to a United States Government or military facility which is authorized to possess the material.

7. In Sec. 110.31, paragraph (f)(5) is redesignated as paragraph (f)(6) and a new paragraph (f)(5) is added to read as follows: Sec. 110.31 Information required in license applications.

(f)

(5) For proposed exports or imports of radioactive waste, the volume, classification, and physical and chemical characteristics of the material and for proposed imports of radioactive waste, the industrial or other process responsible for generation of the waste, the ultimate disposition of the waste, and the status of the arrangements for that disposition, i.e., agreement by a Regional Low-Level Waste Compact or state to accept the material for disposal.

8. In Sec. 110.40, paragraphs (b) and (c) are redesignated (c) and (d), respectively, and a new paragraph (b) is added to read as follows: Sec. 110.40 Commission review.

(b) The Commission shall review an application to import or export radioactive waste.

9. In Sec. 110.41, paragraphs (a)(7) and (a)(8) are redesignated as paragraphs (a)(8) and (a)(9), and a new paragraph (a)(7) is added to read as follows:

Sec. 110.41 Executive branch review.

(a)

(7) An export involving radioactive waste.

10. In Sec. 110.44, paragraph (c) is revised to read as follows: Sec. 110.44 Issuance or denial of licenses.

(c) If, after receiving the Executive Branch judgment that the issuance of a proposed export license will not be inimical to the common defense and security, the Commission does not issue the proposed license on a timely basis because it is unable to make the statutory determinations required under the Atomic Energy Act, the Commission will publicly issue a decision to that effect and will submit the license application to the President. The Commission's decision will include an explanation of the basis for the decision and any dissenting or separate views. The provisions in this paragraph do not apply to Commission decisions regarding license applications for the export of byproduct material or radioactive waste.

11. In Sec. 110.70, paragraph (c) is redesignated as paragraph (d), and new paragraphs (b)(4) and (c) are added to read as follows: Sec. 110.70 Public notice of receipt of an application.

(b)

(4) Radioactive waste.

(c) The Commission will also publish in the Federal Register a notice of receipt of an application for a license to import radioactive waste.

Dated at Rockville, MD, this 22nd day of April 1992.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.
INTERNAL DATA: FR Doc. 92-9828; Filed 4-27-92; 8:45 am; BILLING CODE
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Licensing Requirements for Land Disposal of Radioactive Wastes Vol. 57, No. 4557 FR 8093
Friday, March 6, 1992

AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Proposed Rules
CFR: 10 CFR Part 61
NUMBER: RIN 3150-AE00
Comment period expires April 6, 1992. Comments received after that date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.
CONTACT: Janet Lambert, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492- 3857. Submit written comments to: The Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.

Deliver comments to: 11555 Rockville Pike, Rockville, Maryland, between 7:45 a.m. and 4:15 p.m. Federal workdays.

Copies of the regulatory analysis, the environmental assessment, and the comments received on the rule may be examined at: The NRC Public Document Room at 2120 L Street NW. (Lower Level), Washington, DC. Proposed rule.

The Nuclear Regulatory Commission (NRC) proposes to make four specific changes to its regulations containing licensing requirements for low-level radioactive waste (LLW) disposal facilities. These changes include (1) clarifying that 10 CFR part 61 applies to above-ground disposal facilities; (2) replacing the phrase ''quality control program'' in 61.12(j) with the phrase ''quality assurance program,'' tailored to LLW disposal; (3) updating the Paperwork Reduction Act Statement in Sec. 61.8; and (4) identifying the correct NRC recipient of copies of the licensee's annual reports. The Commission has determined that these changes are needed to correct imprecise wording administrative inconsistencies in the current regulations. These amendments will serve to incorporate established and documented NRC staff positions into the regulation yet will not result in extensive changes to actual text. The proposed changes are intended to simplify LLW disposal facility licensing interactions for NRC, the NRC Agreement States, and potential applicants for LLW disposal licenses.

WORD COUNT: 5,006

TEXT:
SUPPLEMENTARY INFORMATION:

Background

The NRC issued its ''Licensing Requirements for Land Disposal of Radioactive Waste,'' 10 CFR part 61, (hereafter referred to as ''part 61'' or ''the regulation'') in December 1982. Part 61 sets out licensing procedures and performance objectives for the licensing of any ''land disposal facility'' for low-level radioactive waste (LLW) containing source, special nuclear, and byproduct material. It also sets out technical requirements for ''near-surface disposal facilities,'' a subset of land disposal facilities.

The performance objectives, which are set out in subpart C to part 61, require that any ''land disposal facility'' be sited, designed, operated, closed, and controlled after closure so that exposures to humans are within the specified limits. The performance objectives also address protection of inadvertent intruders and workers and minimizing the long-term care needed. Technical requirements, which are found in subpart D to part 61 help ensure that the performance objectives in subpart C will be met. Subpart D establishes the minimal technical requirements for a ''near-surface disposal facility'' in the areas of site suitability, site design, facility operation, waste form, waste classification, and site closure, although the option for alternative requirements is explicitly included for all areas except site suitability. Such a facility is defined in Sec. 61.3 as a land- disposal facility constructed in or within the upper 30 meters of the earth's surface.

Part 61 was developed in response to needs and requests expressed by the public, Congress, Industry, the States, and other Federal Agencies for the codification of comprehensive national criteria to define the level of safety that should be achieved in the land disposal of LLW. Since its promulgation, Part 61 has served as the basis for the development of compatible State regulations for LLW disposal facilities and related licensing guidance documents such as NRC's ''Standard Review Plan for a License Application for a LLW Disposal Facility'' (NUREG-1200), and the ''Standard Format and Content Guide for a License Application for a LLW Disposal Facility'' (NUREG-1199).

In response to a potential national shortage of LLW disposal capacity, Congress enacted the ''Low-Level Radioactive Waste Policy Act of 1980,'' (LLRWPA). This act was subseqently amended by the ''Low-Level Radioactive Waste Policy Amendments Act of 1985,'' (LLRWPAA). These Acts made the individual States responsible for the management and safe disposal of all commercial LLW generated within their borders. Congress also mandated that the States, either alone or in groups called Compacts, were to develop the capability to dispose of their LLW by January 1, 1993. States that fail to meet this deadline face significant economic penalties and the potential loss of access to any available LLW disposal capacity.

Given the mandated deadlines, applications for LLW disposal licenses are already under review and additional applications will be filed in the next few years either with NRC or the appropriate NRC Agreement States (States that have assumed the NRC's regulatory responsibilities for the disposal of LLW under section 274 of the Atomic Energy Act of 1954, as amended). Part 61 or the equivalent and compatible Agreement State regulations are and will be used to determine the acceptability of the proposed LLW disposal facilities.

A review of part 61 against the backdrop of current State and Compact efforts to site and develop LLW disposal facilities has identified two places in the regulations where the current wording is imprecise and should be changed. Currently, Sec. 61.2 defines a ''land disposal facility'' as a LLW disposal facility built ''into the subsurface of the land.'' The words ''into the subsurface'' have been interpreted as limiting the regulatory applicability of part 61 to those facilities that are covered with {pg 8094} soil, so as to exclude above-ground disposal facilities like above-ground vaults, that are not covered with soil.

In the second instance, Sec. 61.12(j) of the regulation incorrectly labels the quality assurance (QA) program developed for the facility over its entire life from planning, through site characterization, construction, operation, and closure, as a quality control (QC) program. From both the breadth of the program as described in Sec. 61.12(j) and in staff documents related to LLW disposal, the description of the information regarding the applicants' ''quality control'' program to be submitted in the application and to be reviewed by the NRC as presented in NUREGs 1199, and 1200, clearly is intended to be a quality assurance program, of which quality control is a component. Further clarification was provided by the staff in NUREG-1293 ''Quality Assurance Guide for a Low-Level Radioactive Waste Disposal Facility.'' It is clear that NRC had actually intended to require the applicant to develop a quality assurance program for the LLW disposal facilities. (Copies of NUREG-1199, NUREG-1200, and NUREG- 1293 may be purchased from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013- 7082. Copies are also available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. A copy is also available for inspection and copying for a fee in the NRC Public Document Room, 2120 L Stret, NW. (Lower Level), Washington, DC.)

In the third instance, NRC is proposing to update Sec. 61.8- the ''Information Collection Requirements-OMB approval'' statement to reflect the fact that subsequent to the original issuance of part 61, NRC requested, and obtained the Office of Management and Budget (OMB) approval for the part 61 information collection requirements. Section 61.8 was to be corrected the first time other revisions were made to part 61.

NRC has also identified a fourth place in part 61 where a reporting requirement is inconsistent with the present organization of NRC.

Accordingly, the Commission has initiated this rulemaking to make the necessary changes to part 61.

Discussion of Proposed Revisions

I. Amend the definition of ''land disposal facility'' in Sec. 61.2 to specify that the term refers to LLW disposal facilities which are on or protrude through the earth's surface and do not have an earthen cover, in addition to those that are in the ground and have an earthen cover. The purpose of this change is to clarify the regulatory applicability of part 61 to the licensing of ''above- ground'' disposal designs like the ''above-ground vault,'' in particular, the applicability of the performance objectives of part 61 to these designs.

The change that NRC is proposing to make to the definition of ''land disposal facility'' in part 61 will clarify that the regulation will be used by NRC to license above-ground disposal facilities. However, at this time the NRC has no specific criteria analogous to the near-surface disposal requirements of Secs. 61.50(a), 61.51(a), and 61.52(a) of subpart D for above-ground disposal because of the special technical characteristics of above-ground disposal facilities. Only those portions of the regulation that apply generically to ''land disposal facilities'' will be directly applicable to above-ground disposal. Specifically, this means that the overall performance objectives of subpart C will apply as well as the part 61 administrative and procedural requirements, the environmental monitoring requirements, the financial assurance requirements, the waste transfer and manifest requirements, and the general institutional requirements.

Establishing the applicability of the subpart C performance objectives to above-ground disposal is particularly important. Any applicant for a license for an above-ground disposal facility under part 61 will have to demonstrate to the NRC that the proposed facility will meet the same safety requirements and dose limits that apply to any LLW disposal facility that is built completely underground. The demonstration of compliance will have to address the unique features of the above-ground design, the special technical considerations associated with those features, their potential health and safety consequences, and reconcile these with the subpart C performance objectives.

In addition, many of the existing subpart D requirements could be useful in evaluating the technical merits and general licensability of an above-ground disposal facility, even though under part 61 they are not applicable as requirements for such facilities.

To provide further clarification regarding the applicability of part 61 to the licensing of above-ground disposal facilities, NRC also is proposing to amend the ''Disposal Facility'' discussion in the Concepts Section-61.7. The proposed change to Sec. 61.7(a)(1) will clarify the distinction made by the NRC between near-surface disposal and above-ground disposal, to emphasize that near-surface LLW disposal facilities built partially or totally above -grade have protective earthen covers, while similar facilities constructed without earthen covers are considered to be ''above-ground disposal facilities''.

It should be noted that NRC is not providing either technical criteria or guidance for above-ground disposal designs in this rulemaking. It is expected that, should NRC receive an application for above-ground disposal, criteria will be developed on a case-by-case basis.

II. Replace the term ''quality control program'' in Sec. 61.12(j) with the term ''quality assurance program, tailored to LLW disposal.'' The purpose of this change is to clarify what steps an applicant for an LLW disposal facility license must take in order to assure that the facility will perform as intended, and also to assure that the necessary records and documentation are available for evaluation and performance assessment by NRC or an Agreement State at the time of license submittal.

III. Revise Sec. 61.8 to indicate that the NRC has requested and obtained OMB approval for the information collection requirements in part 61. Under the OMB guidelines that were in effect when the original part 61 was issued, OMB approval of the part 61 information collection requirements was not necessary because the regulation was expected to affect less than 10 licensees. Subsequently the OMB guidelines changed, and part 61 was no longer exempt from the OMB approval requirement. Accordingly, NRC submitted part 61 for OMB review and obtained the OMB clearance that is required by the Paperwork Reduction Act. The purpose of this proposed change is to update Sec. 61.8 to correctly reflect this approval.

IV. Revise Sec. 61.80(i)(1) to identify the correct NRC headquarters recipient of copies of the annual report.

Open Meeting on Proposed Changes

Before proceeding with the rulemaking, the NRC staff invited the States to an open public meeting to discuss the changes that NRC was contemplating for part 61. In order to maximize State participation, the meeting was held in conjunction with the annual meeting of the Conference of Radiation Protection Control Directors (CRPCD) on May 14, 1991 in Wichita, Kansas. At the meeting, NRC staff members briefly explained the proposed changes for part 61. State representatives and other attendees were given the opportunity to provide comments, to ask questions, or participate in further discussions. A (pg 8095) transcript was made of the meeting so the proceedings could be part of the formal record for the rulemaking. Attendees were given an additional 2 weeks

to submit written comments. However, the NRC did not receive any comments in response to this opportunity.

Of the approximately forty State representatives that participated in the May 14, 1991, meeting, seven representatives (those from California, New York, Illinois, New Jersey, Washington, Pennsylvania, and Nebraska) offered comments. None of them voiced objections either to the specific revisions NRC was proposing or to the idea of revising part 61 in general. Two technical comments were offered at the Wichita meeting that were intended to address the issues for this rulemaking and both were considered in developing the proposed rule.

The representatives from Washington and Illinois expressed concern regarding the compatibility of the proposed changes with their State rules, because they are presently involved in LLW disposal facility license reviews. In order to prevent possible impacts on their licensing process, they suggested that if, as Agreement States, their States would be obligated to incorporate the resulting changes into their respective LLW regulations, they should be afforded flexibility in the manner or timing of this action. The NRC staff explained that it is NRC's policy to give Agreement States 3 years to reflect changes like those proposed for part 61 in their LLW regualtions. At the end of the three year period, if a State has not completed its licensing process, NRC staff would consider a limited extension on a case-by-case basis.

One of the commentors voiced concern about the concept of above-ground disposal. The commentor expressed doubt that an applicant for an above-ground disposal facility would be able to get a licensed engineer to certify the integrity of such a structure for 500 years unless long-term active maintenance was provided. While NRC acknowledges that there are significant engineering challenges that will have to be resolved by an applicant in order to license an above-ground disposal facility, the NRC does not want the language of part 61 to preclude an applicant from having the opportunity to meet those challenges.

The other commentor, from Nebraska, offered a comment about ''above- grade'' disposal facilities, the kind of facility that Nebraska is considering for its LLW disposal needs. The commentor noted that licensing an ''above-grade'' LLW disposal facility requires special guidance that is not provided in the current part 61. A recommendation was made for NRC to consult with the States currently developing above-grade disposal facilities for the benefit of their experience in this area. From the NRC perspective, ''above-grade disposal'' and ''above-ground disposal'' are considered to be similar in that both rise above the land surface of the overall disposal site. However, for purposes of regulating LLW disposal under part 61, NRC makes an important distinction between the two. While ''above-grade facilities'' may rise above the original grade (surface) of the disposal site, they have a constructed soil cover and when completed do not actually protrude through the land surface to expose the disposal structure to the elements. NRC has determined that these types of facilities are already clearly covered under part 61 and are not of concern for this rulemaking. Although the comment did not directly apply to the proposed rulemaking, the experience gained by the States in licensing ''above-grade'' disposal could prove to be applicable and useful to licensing ''above-ground'' disposal.

Issue of Compatibility for Agreement States

Under existing NRC policy and guidelines, two of the changes proposed in this rulemaking would be matter of compatibility for the NRC Agreement States: The change to the definition of land disposal facility in Sec. 61.2 is Division I compatibility, and the ''QC'' to ''QA'' change in Sec. 61.12(j) is Division II. This means that if the final amendments to part 61 retain these provisions, those Agreement States which have assumed NRC's regulatory authority for the disposal of LLW under section 274 of the Atomic Energy Act (AEA) of 1954, as amended, will be required to incorporate the new definition of ''land disposal facility'' essentially verbatim directly into their State regulations for LLW disposal. The incorporation of the Division II change is also required, however, the Agreement States have more flexibility than for the Division I change. The language adopted need not be identical to the NRC regulations, but the effect cannot be less stringent. Based on the existing guidelines, the changes would have to be incorporated within 3 years after the final revisions to part 61 are issued.

The Commission, however, is currently considering a reevaluation of its compatibility policy and may decide to revise its requirements for the Agreement States. If a change is made to the compatibility policy that affects the above compatibility position, it may be necessary to revisit this position.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969 as amended, and the Commission's regulations in subpart A of 10 part 51, that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment and therefore, an environmental impact statement is not required. Three of the proposed changes-the ''quality control'' to ''quality assurance'' change in Sec. 61.12(j), the update of the Paperwork Reduction Act Statement in Sec. 61.8, and the correction of the organizational inconsistency in Sec. 61.80(i)(1) are the types of actions described in categorical exclusion Sec. 51.22(c)(2). As such they are considered by the Commission to be corrective and nonsubstantive in nature and will not have a impact on the environment. The remaining changes, which will expand the applicability of part 61 to the licensing of above-ground LLW disposal, also will not have an impact on the environment in that these amendments do not change the required level of overall performance of LLW disposal. Further, any environmental impact of operating such a facility would be addressed as a part of the licensing action for that specific facility under 10 CFR part 51. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the environmental asssessment and the finding of no

significant impact are available from Janet Lambert, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3857.

Paperwork Reduction Act Statement

This proposed rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150- 0135.

Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the alternatives considered by the Commission and explains the decision to revise part 61. The draft analysis is (pg 8096) available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the analysis may be obtained from Janet Lambert, (301) 492- 3857.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule, if adopted, will not have a significant economic impact on a substantial number of small entities. The changes to part 61 that are proposed in this rule will only affect those entities that decide to apply for a license to build and operate a LLW disposal facility. In the Low-Level Radioactive Waste Policy Act 1980 (LLRWPA) and the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA), Congress mandated that the individual States or groups of States called compacts should provide the LLW disposal capacity for the LLW generated within each of their borders. This rule will not have significant economic impact because the changes to part 61 are trivial in nature and only a small number of licensees are likely to be affected.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this proposed rule, and therefore, that a backfit analysis is not required because these amendments do not involve any provisions which would impose backfits as defined in 10 CFR 50.109(a)(1).

List of Subjects in 10 CFR Part 61

Criminal penalty, Low-Level waste, Nuclear materials, Reporting and recordkeeping requirements, Waste treatment and disposal. For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended and 5 U.S.C. 553, the NRC is proposing the following amendments to 10 CFR part 61.

PART 61-LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

1. The authority citation for part 61 continues to read as follows:

Authority: Secs. 53, 57, 62, 63, 65, 81, 161, 182, 183, 68 Stat. 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2073, 2077, 2092, 2093, 2095, 2111, 2201, 2232, 2233); secs. 202, 206, 88 Stat. 1244, 1246, (42 U.S.C. 5842, 5846); secs. 10 and 14, Public Law 95-601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851).

For the purposes of Sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); Tables 1 and 2, Secs. 61.3, 61.24, 61.25, 61.27(a), 61.41 through 61.43, 61.52, 61.53, 61.55, 61.56, and 61.61 through 61.63 are issued under sec. 161(b), 68, Stat. 948, as amended (42 U.S.C 2201)(b); Secs. 61.9a, 61.10 through 61.16, 61.24 and 61.80 are issued under sec. 1610, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. In Sec. 61.2, the definition of ''land disposal facility'' is revised to read as follows:
Sec. 61.2 Definitions.

Land disposal facility means the land, buildings, and equipment which are intended to be used for the disposal of radioactive wastes on the surface or into the subsurface of the land. For purposes of this Chapter, a ''geologic repository'' as defined in part 60 is not considered a ''land disposal facility.''

3. In Sec. 61.7, paragraph (a)(1) is revised to read as follows: Sec. 61.7 Concepts.

(a) The Disposal Facility. (1) Part 61 is intended to apply to land disposal of radioactive waste and not to other methods such as sea or extraterrestrial disposal. Part 61 contains procedural requirements and performance objectives applicable to any method of land disposal. It contains specific technical requirements for near-surface disposal of radioactive waste, a subset of land disposal, which involves disposal in the uppermost portion of the earth, approximately 30 meters. Near- surface disposal includes disposal in engineered facilities which may be built totally or partially above-grade provided there is a protective earthen cover. Near-surface disposal does not include disposal facilities which are partially or fully above-grade with no protective earthen cover, which are referred to as ''above-ground disposal. Burial deeper than 30 meters may also be

satisfactory. Technical requirements for alternative methods may be added in the future.

4. Section 61.8 is revised to read as follows:
Sec. 61.8 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collecton requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et. seq.). OMB has approved the information collection requirements contained in this part under control number 3150-0135.

(b) The approved information collection requirements contained in this part appear in Secs. 61.3, 61.6, 61.9, 61.10, 61.11, 61.12, 61.13, 61.14, 61.15, 61.16, 61.20, 61.22, 61.24, 61.26, 61.27, 61.28, 61.30, 61.31, 61.53, 61.55, 61.57, 61.58, 61.61, 61.62, 61.63, 61.72, and 61.80.

5. In Sec. 61.12, paragraph (j) is revised to read as follows:
Sec. 61.12 Specific technical information.
(j) A description of the quality assurance program, tailored to LLW disposal, developed and applied by the applicant for the determination of natural disposal site characteristics and for quality assurance during the design, construction, operation, and closure of the land disposal facility and the receipt, handling, and emplacement of waste.

6. In Sec. 61.80, (i)(1) is revised to read as follows:
Sec. 61.80 Maintenance of records, reports, and transfers.

(i)(1) Each licensee authorized to dispose of waste materials received from other persons, pursuant to this part, shall submit annual reports to the appropriate Commission regional office shown in appendix D of part 20 of this chapter, with copies to the Director, Division of Low-Level Waste Management and Decommissioning, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Reports must be submitted by the end of the first calendar quarter of each year for the preceding year

Dated at Rockville, Maryland, this 28th day of February, 1992.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.
INTERNAL DATA: FR Doc. 92-5247; Filed 3-5-92; 8:45 am; BILLING CODE
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Citation 310

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0047979
Disposal of Radioactive Wastes
Vol. 54, No. 100
Thursday, May 25, 1989

AGENCY: NUCLEAR REGULATORY COMMISSION; Nuclear Regulatory Commission.
DOC TYPE: Rules and Regulations
CFR: 10 CFR Part 61
The rule will become effective on June 26, 1989.
CONTACT: W. Clark Prichard, Division of Engineering, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3884.
Final rule.
The NRC is amending its regulations to require disposal of greater-than-Class-C (GTCC) low-level radioactive wastes in a deep geologic repository unless disposal elsewhere has been approved by the Commission. The amendments are necessary to ensure that GTCC wastes are disposed of in a manner that would protect the public health and safety and therefore obviate the need for altering existing classifications of radioactive wastes as high-level or low-level.

WORD COUNT: 5104
TEXT:

Background

On May 18, 1988, the Nuclear Regulatory Commission published in the Federal Register (53 FR 17709) proposed amendments to Part 61 to require geologic repository disposal of greater-than-Class-C (GTCC) low level radioactive waste (LLW) unless an alternative means of disposal was approved by the Commission. The proposed

amendments requiring geologic repository disposal, or an approved alternative, were aimed at insuring that GTCC waste would be disposed of in a manner consistent with the protection of public health and safety. This action was taken in lieu of a revision of the definition of high level radioactive waste (HLW). In proposing the amendments, the Commission outlined its rationale for not proceeding with a revision of the definition of HLW along the lines proposed in the advance notice of proposed rulemaking (ANPRM) published in February 27, 1987 (51 FR 5992).

It is the Commission's view that intermediate disposal facilities may never be available. In this event, a repository would be the only type of facility generally capable of providing safe disposal for GTCC wastes. At the same time, the Commission wishes to avoid foreclosing possible use of intermediate disposal facilities by the Department of Energy (DOE). If DOE chooses to develop one or more intermediate disposal facilities, the Commission anticipates that the acceptability of the facilities would be evaluated in the light of the particular circumstances, considering for example the existing performance objectives of 10 CFR Part 61 and any generally applicable environmental radiation protection standards that might have been established by the U.S. Environmental Protection Agency. Technical criteria to implement the performance objectives and environmental standards would be developed by the Commission after DOE had selected a specific disposal technology and decided to pursue development of an intermediate facility.

The Commission considers that the Part 61 amendments would obviate any need to reclassify certain GTCC wastes as HLW. Many comments on the ANPRM advocated classification of all GTCC wastes as HLW in order to ensure availability of a safe disposal ''home'' for those wastes. These amendments achieve the same purpose while leaving open the prospect that an intermediate disposal facility may prove attractive at some time in the future.

Office of Technology Assessment Report

Following publication of the proposed amendments, the Congressional Office of Technology Assessment published a report on management of GTCC LLW. fn 1 Its recommendations on disposal of GTCC waste generally support the stance taken by the Commission in the proposed amendments. fn 1 U.S. Congress, Office of Technology Assessment, An Evaluation of Options for Managing Greater than Class C Low Level Radioactive Waste, OTA-BP-O-50, October, 1988.

The OTA report states that ''If a decision about the disposal of GTCC wastes were required today, a conservative approach would be to permanently isolate the waste in a deep geologic repository, as has been proposed for commercial spent fuel and defense HLW.'' fn 2 The report goes on to acknowledge that further research and development could demonstrate the acceptability of intermediate disposal methods, such as deep-augured holes or an intermediate-depth repository.

fn 2 ibid. pp. 2-3.

The Commission emphasizes that these amendments preserve DOE's flexibility to pursue either one of these alternatives. The OTA report agrees with the Commission that the volume of GTCC waste is probably not great enough to justify a separate facility for this waste; costs of geologic repository disposal of GTCC waste would be comparable to, or lower than, developing a special disposal facility solely for GTCC waste.

The overall recommendations of the OTA report are that a Federal off-site interim storage facility for GTCC waste be established, as no permanent disposal facility could be available for at least 15 to 20 years. Until these interim storage facilities become operational, the Federal government could provide limited access to an existing DOE storage facility. Within the next year or so, DOE should begin to evaluate the impacts on repository operations and performance of emplacing GTCC waste in the repository. If DOE determines that such impacts are unacceptable, it could then begin to develop an alternative disposal facility.

Public Comments

The Commission received 35 comment letters in response to its request for public comment. Among the responses were comments from the Department of Enegy (DOE), the Environmental Protection Agency (EPA), the States of Indiana, New York, Pennsylvania, South Carolina, Vermont, Michigan, Washington, Tennessee, and the Midwest Interstate Low Level Radioactive Waste Commission. Remaining comments came from industry, professional, and environmental groups, as well as private citizens. The following is a summary of major comments and Commission responses. A detailed analysis of public comments is available at the Commission's Public Document Room, 2120 L Street NW., Washington, DC.

(a) Restricting Alternatives

Many comments, including some by States and a regional state LLW compact, argued for restricting the alternatives to geologic repository disposal. These comments were concerned that GTCC waste would be disposed of in State or State compact operated facilities. NRC was urged to ''eliminate the option'' of disposal in State or State compact facilities, by limiting alternative disposal methods to Federal facilities.

This concern must be examined in the light of the Low Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. 99-240, 42 U.S.C. 2021b et seq. (LLWPAA) which clarified Federal and State responsibilities for radioactive waste disposal. States are responsible only for commercial LLW defined as ''A'', ''B'', or ''C''

waste by Part 61. All HLW, and all GTCC LLW is a Federal responsibility. The concerns expressed by commenters on this point have therefore been addressed, to a large extent, by legislation. No health and safety concerns have been presented that would persuade the Commission to require the use of Federal facilities, to the exclusion of other facilities licensed under the Atomic Energy Act, for the disposal of all GTCC. Indeed, the LLWPAA appears to recognize the continued authority of a State, subject to the provisions of its compact, or a compact region, to accept GTCC waste for disposal, and in the absence of some compelling reason the Commission's judgment is that this option should be preserved.

(b) Applicability of Standards

Both EPA and DOE, among other commenters, were concerned about one aspect of possible geologic repository disposal of GTCC waste. Should GTCC LLW be emplaced in a repository along with HLW, these two categories of waste would be subject to different standards-EPA's HLW standard, and EPA's LLW standard. In addition, they questioned whether NRC's 10 CFR Part 60, or 10 CFR Part 61 would apply to GTCC waste in a repository. Commenters cited the potential for confusion in having dual standards apply to waste in the same repository.

The Commission notes that its regulations were developed for specific types of disposal facilities. Thus, Part 60 applies to any geologic repository for HLW, regardless of what other types of radioactive wastes may be disposed of there. Similarly, Part 61 pertains to land disposal facilities other than repositories. Therefore, only Part 60, and not Part 61, would be relevant for disposal of GTCC wastes in a HLW repository.

If GTCC wastes were to be disposed of in a deep geologic repository, questions might be raised regarding the applicability to those wastes of the waste form and packaging requirements of Part 60. As Part 60 is now structured, the retrievability requirement of Sec. 60.111 and the implicit requirement for packaging to permit safe handling and emplacement apply to all wastes, including GTCC wastes, that are disposed of in a repository. Applicability of the waste package containment requirement (300-1,000 years) is specifically limited to packages containing HLW or spent nuclear fuel. Because GTCC wastes would not be classified as HLW under these amendments, the waste package requirements of Part 60 would not pertain to GTCC wastes. The performance objectives for the engineered barrier system (release rate of 1 part per 100,000 per year) and for overall system performance are stated so as to be applicable to all wastes emplaced in a repository. The degree to which these performance objectives would affect GTCC waste form and packaging would depend on the specific radionuclides present in the GTCC wastes and on the physical and chemical forms of those wastes.

For all wastes disposed of in a repository, Part 60 now requires:

(1) waste disposal operations shall be conducted in compliance with the radiation protection requirements of Part 20 of the NRC's regulations (Sec. 60.111(a)),

(2) the option of waste retrieval shall be maintained for a period up to 50 years after the start of waste emplacement operations (Sec. 60.111(b)), and

(3) "* * * any release of radionuclides from the engineered barrier system shall be a gradual process which results in small fractional releases to the geologic setting over long times * * * The release rate of any radionuclide from the engineered barrier system following the containment period shall not exceed one part in 100,000 per year of the inventory of that radionuclide calculated to be present at 1,000 years following permanent closure * * *" (Sec. 60.113).

Also implicit in Part 60 is a requirement that any GTCC wastes disposed of in a repository not prevent HLW or spent fuel from meeting the specific performance objectives for those types of wastes.

These general objectives can be achieved in various ways for different wastes. For example, containment within a durable waste canister might be appropriate for short-lived wastes (half-lives about 30 years or less), while processing of wastes to reduce leachability or use of retardant backfill materials might be more appropriate for longer-lived wastes. The NRC is initiating an effort, as contemplated by Sec. 60.135(d) of Part 60, to specify in more detail the waste form and packaging criteria appropriate for specific types of GTCC wastes. The Commission anticipates that DOE will develop specific waste form and packaging alternatives for consideration by the NRC in that rulemaking, and the Commission would welcome similar suggestions from other interested parties.

Previous development of EPA's standards has addressed types of wastes rather than types of disposal facilities as in NRC's regulations. Thus, it is possible that a repository containing both HLW and GTCC LLW would be subject to two EPA standards. The NRC does not anticipate that this will cause significant problems for DOE, since the LLW standard has not yet been proposed and this situation can be taken into account as the standard is developed.

(c) Effects on Repository Program

There were a number of comments, including those of DOE, that expressed concern over the possible impacts on the geologic repository program of emplacement of GTCC waste along with HLW in the repository. Specific concerns were over the potential for additional costs, GTCC waste taking up valuable repository space, and the burden for DOE of having to include GTCC waste in its performance assessment of the repository.

In the Commission's view, these concerns do not warrant changes from the proposed amendments. First, the proposed amendments allow for a range of GTCC disposal methods to be used by DOE. Under present regulations on land disposal of LLW (10 CFR Part 61), GTCC waste is specifically identified as ''not generally acceptable'' for near-surface disposal. Disposal methods for GTCC waste must generally be ''more stringent'' than near-surface disposal. The proposed amendments to Part 61 specified that one ''more stringent'' method would be geologic repository disposal. Other methods are not specified but are also left open to DOE, subject to Commission approval. The proposed amendments were not what prevented DOE from routinely using near-surface disposal; that is already prohibited by 10 CFR Part 61. Thus, relevant cost impacts of the amendments do not involve a comparison between costs of geologic repository disposal versus costs of near-surface disposal. Cost comparisons involve geologic repository disposal versus other unspecified Commission-approved ''intermediate'' methods. However, the proposed amendments did not require one method to be selected over another; either option is permitted. DOE would presumably weigh cost comparisons along with other factors in selecting which disposal method to use. Even if geologic repository disposal were selected, this type of disposal should not cause an increase in the present HLW fee charged nuclear utilities-a specific concern raised on behalf of industry. Rather, as suggested by DOE's study of the matter pursuant to section 3(b)(3) of the LLWPAA, it is likely that a separate fund, similar to the HLW Nuclear Waste Fund, would be established to provide for payment of disposal costs by the generators of GTCC wastes, either as an advance fee or as a charge upon waste receipt (Recommendations for Management of Greater-than-Class C Low Level Radioactive Waste, U.S. Department of Energy, DOE/NE-0077, 1987). The Commission anticipates that new legislation would be enacted if required so that the current situation does not represent a major impediment to disposal of GTCC wastes.

The fact that the expected volume of GTCC waste is very low was an important factor in the Commission's decision to propose the Part 61 amendments. Current evidence shows that the expected volume of GTCC waste is very small relative to volumes of HLW and Class A, B, and C LLW. It is projected that 2,000-4,800 cubic meters of commercially-generated GTCC waste will need disposal through the year 2020 fn 3 . This amount of waste is smaller than the anticipated excavated volume of a single emplacement room of a repository, and would not present a significant burden on the capacity of the repository to receive HLW. It would not be a significant factor underlying the need for a second repository.
fn 3 U.S. Department of Energy estimates.

Regarding DOE's assessment of the performance of the repository, if DOE found that it did pose a major obstacle, these amendments would permit DOE to choose an acceptable alternative disposal method.

(d) Relationship to Defense Wastes

Some comments were concerned with any effects this rulemaking would have on defense wastes.

The proposed amendments apply solely to commercial GTCC LLW, and have no bearing on facilities for defense LLW. NRC has licensing authority only over commercially generated LLW; it has no licensing authority over defense LLW, including defense LLW that might be analogous to GTCC waste. Because Part 61, by its terms, would only apply to DOE activities subject to NRC jurisdiction, and NRC jurisdiction is lacking for defense LLW facilities, these efforts would have no effect on defense LLW disposal.

In the case of facilities authorized for the disposal of HLW, the Commission does have jurisdiction and the Commission's regulations would continue to apply. Accordingly, to the extent that DOE disposes of HLW in facilities other than geologic repositories, a license under Part 61 would be required as before. DOE would not necessarily be precluded from proceeding with such disposal, but as has always been the case DOE would need to obtain the Commission's approval. The NRC staff has been working with DOE to develop appropriate classifications for defense reprocessing wastes under existing laws and regulations. These efforts have led to agreement that certain decontaminated salts at Savannah River and West Valley, generated incidentally in the course of processing, should not be classified as HLW. Additional efforts are now underway to review materials to be produced at Hanford in projected operations, to determine whether the disposal thereof is subject to Commission licensing.

(e) Restricting DOE Options for GTCC Management

DOE argued that the proposed amendments would limit its statutory authority, under the LLWPAA, to develop a comprehensive policy for management of GTCC waste.

The Commission considered the proposed rule to be entirely consistent with the ''comprehensive scheme for developing a policy for disposal of GTCC wastes'' referred to in this comment. The proposed rule did not constrain DOE's ability to ''identify disposal options, financing mechanisms, and the legislation needed to implement them.'' Nor did the proposed rule require disposal of GTCC wastes prior to submittal of DOE's recommendations to Congress. The proposed rule only recognized that GTCC wastes must be disposed of in a facility licensed by the NRC-a constraint imposed by the LLWPAA.

In DOE's 1987 report to Congress regarding management of GTCC wastes (DOE/NE-0077), DOE stated that certain regulatory actions were needed before DOE could proceed with identification of disposal options and costs. One of these actions was a decision by NRC whether or not to proceed with development of a concentration based definition of high-level waste. The Commission has decided not to develop such a definition for the reasons previously discussed. Thus, one of the regulatory impediments previously identified by DOE will be removed by this rulemaking.

(f) Reference to Analyses of Kocher and Croff

In the proposed rule, the Commission cited a technical report which had recently been published (Kocher, D.C. and A.G. Croff, A Proposed Classification System for High-Level and Other Radioactive Wastes, ORNL/TM-10289, Oak Ridge National Laboratory, 1987). The Commission cited this report to support its view that evaluations of the waste isolation capabilities of ''intermediate'' disposal facilities would be so speculative and site-specific that such analyses would not provide a technically defensible basis for classifying wastes as HLW or non-HLW. The Commission further stated that it could not accept an alternative classification approach presented in that report because that approach was based solely on the short-term storage and handling risks associated with the heat and external radiation levels generated by a waste rather than on the degree of waste isolation required following disposal. The authors of the cited report (Kocher and Croff) commented on the proposed rule alleging that the Commission had misrepresented the content and conclusions of their report.

As discussed in the detailed analysis of public comments, the Commission acknowledges that its statements could have been misunderstood. The Commission's purpose in referring to Kocher and Croff's report was solely to support its view that the proposal presented in the ANPRM, i.e., classification of wastes based on analyses of the projected performance of ''intermediate'' disposal facilities, should not be pursued because of the limited development of these facilities and because their performance is likely to be highly site-specific. The Commission continues to believe that Kocher and Croff's report supports this view. Other references to Kocher and Croff's work are withdrawn.

(g) Licensing Under Part 61

Concerning alternatives to geologic repository disposal, some comments argued that the licensing of any alternative disposal method should not necessarily be under the framework of Part 61, as was proposed in Sec. 61.55. This would be too restrictive in their view.

The Commission's regulations for licensing of radioactive waste disposal consist solely of 10 CFR Part 60, which applies to disposal in a geologic repository, and 10 CFR Part 61, which applies to land disposal other than in a geologic repository. A wide variety of disposal methods, including all of those currently proposed as ''intermediate'' disposal methods, could be licensed under Part 61. Thus, the Commission does not believe that Sec. 61.55 places any unnecessary restrictions on DOE. On the contrary, as provided in Sec. 61.1, Part 61 establishes procedures, criteria, and terms and conditions with respect to ''land disposal of radioactive waste''. In implementing this objective, Sec. 61.3 requires that the disposal of low-level waste at any ''land disposal facility'' must be authorized udner Part 61. Section 61.7 notes that additional technical criteria might be needed for licensing of disposal facilities other than ''near-surface'' disposal. If needed, such criteria would be added to Part 61 before licensing an ''intermediate'' disposal facility. Because ''land disposal facility'' is defined broadly (so as to include any facility other than a geologic repository), the reference to licensing under Part 61 is proper and in conformance with the existing regulatory structure.

(h) Mixed GTCC Waste

EPA raised the possibility that some GTCC wastes would also contain hazardous materials subject to RCRA (Resource Conservation and Recovery Act) regulations. The Commission acknowledges this possibility as well as the importance of steps to insure that ''mixed'' GTCC wastes are managed appropriately. DOE will need to consider applicable RCRA requirements as well as those arising under the Atomic Energy Act. Should RCRA requirements associated with GTCC waste represent a significant impediment to placing a geologic repository in service, DOE will still have the option to propose the use of a separate facility.

(i) Limiting State Responsibility

A number of comments wanted the Commission to promulgate regulations making all radioactive waste which is hazardous for over 100 years a Federal responsibility. Congress clarified Federal/State responsibilities for radioactive waste in the LLWPAA. States are responsible for all commercially-generated Class A, B, and C LLW. The Federal government is responsible for the disposal of HLW and defense LLW. In view of this statutory framework, which the Commission considers to be compatible with protection of public health and safety, there would be no basis for any Commission action at this time.

Changes From the Proposed Rule

Only one change from the proposed rule has been made in these final amendments. Proposed Sec. 61.55(a)(2)(iv) required geologic repository disposal of GTCC waste ''unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are submitted to the Commission for approval.'' A comment pointed out that the mere submittal of proposals was quite different than approval of proposals by the Commission. The Commission agrees that its intent is better expressed by requiring proposals to be approved. Accordingly, the wording in this section has been changed to read ''proposals * * * are approved by the Commission.''

Final Rule

Following its review and analysis of the public comments, the Commission believes that the course of action it had proposed-requiring geologic repository disposal of GTCC waste, or approved alternative-should be adopted. Therefore, these final amendments to Part 61 deviate little from those proposed. By these amendments, the

Commission is providing DOE with the regulatory framework DOE needs to proceed with plans for management of GTCC waste. The rule identifies one approved method of disposal for GTCC waste, but allows DOE to plan and develop an alternative method if DOE so desires, subject to Commission approval. It is now up to DOE to evaluate its options for GTCC waste disposal, and to proceed with GTCC disposal.

In line with the foregoing discussion, therefore, the Commission is promulgating two changes to its existing rules. First, by amending 10 CFR 61.55, it would henceforth require all greater-than-Class-C waste to be disposed of in a geologic repository unless an alternative proposal is approved by the Commission. Second, the jurisdictional reach of 10 CFR Part 61 would be extended to cover all activities of the Department of Energy that may be subject to the licensing and regulatory authority of the Commission. This is intended to reflect the policy of the Low-Level Radioactive Waste Policy Amendments Act, which provides that all commercially-generated waste with concentrations exceeding Class C limits shall be disposed of in a facility licensed by the Commission that the Commission determines is adequate to protect the public health and safety. This change would take the form of eliminating the more restrictive language regarding the Department of Energy that appears in Sec. 61.2.

Environmental Impact: Categorical Exclusion

The amendments to Part 61 contained herein are corrective or of a minor nature and do not substantially modify existing regulations. Accordingly, under 10 CFR 51.22(a) and 51.22(c)(2), they are eligible for categorical exclusion from the preparation of an environmental assessment.

The first change, pertaining to the definition of ''person,'' is corrective in that it merely reflects the broader jurisdiction of the Commission under the Low-Level Radioactive Waste Policy Amendments Act. The modification is not substantial.

The second change, pertaining to the disposal of greater-than-Class-C radioactive wastes in a geologic repository, is minor. The existing regulations in 10 CFR Part 61 already preclude disposal of GTCC in a Part 61 licensed disposal facility without further review and approval. This amendment does no more than state the Commission's conclusion that, in the absence of such an approved alternative, a geologic repository is the only currently authorized facility acceptable for GTCC disposal without further review by the Commission. It is thus a minor change to specify that the ''more stringent'' methods are to include disposal in a repository, where it is also expressly provided that, as before, proposals for other methods of disposal may still be submitted to the Commission for approval. No substantial modification of existing regulations is involved.

Paperwork Reduction Act Statement

This rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget approval number 3150-0135.

Regulatory Analysis

The Commission has prepared a regulatory analysis for this final regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW., Washington, DC. Single copies of the analysis may be obtained from W. Clark Prichard, Division of Engineering, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3884.

Regulatory Flexibility Act Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), and NRC Size Standards (December 9, 1985, 50 FR 50241), the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities. The only entity subject to regulation under this rule would be the U.S. Department of Energy, which does not fall within the scope of the definition of ''small entities'' set forth in the Regulatory Flexibility Act. All waste generators, some of which might be classified as small entities, must pay the costs associated with management and disposal of the wastes they generate. This rule would not affect those costs since it preserves all options currently available for waste disposal. Only DOE's selection of a specific disposal technology from the full range of alternatives available would potentially have an economic impact on small entities.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this final rule, and therefore, that a backfit analysis is not required for this final rule, because these amendments do not involve any provisions which would impose backfits as defined in 10 CFR 50.109(a)(1).

List of Subjects in 10 CFR Part 61

Low-level waste, Nuclear materials, Penalty, Radioactive waste, Reporting and recordkeeping requirements, Waste classification, Waste treatment and disposal.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is adopting the following amendments to 10 CFR Part 61.

PART 61-LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

1. The authority citation for Part 61 continues to read as follows:

Authority: Secs. 53, 57, 62, 63, 65, 81, 161, 182, 183, 68 Stat. 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2073, 2077, 2092, 2093, 2095, 2111, 2201, 2232, 2233); secs. 202, 206, 88 Stat. 1244, 1246, (42 U.S.C. 5842, 5846); secs. 10 and 14, Pub. L. 95-601, 94 Stat. 2951 (42 U.S.C. 2021a and 5851).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); Tables 1 and 2, Secs. 61.3, 61.24, 61.25, 61.27(a) 61.41 through 61.43, 61.52, 61.53, 61.55, 61.56, and 61.61 through 61.63 are issued under sec. 161b, 68 Stat. 948 as amended (42 U.S.C. 2201(b)); Secs. 61.9a, 61.10 through 61.16, 61.24, and 61.80 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. In Sec. 61.2, the definition of ''person'' is revised in the alphabetical sequence to read as follows:

Sec. 61.2 Definitions.

As used in this part:

''Person'' means (1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, government agency other than the Commission or the Department of Energy (except that the Department of Energy is considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to law), any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (2) any legal successor, representative, agent, or agency of the foregoing.

3. In Sec. 61.55, paragraph (a) is amended by revising paragraph (a)(2)(iv) to read as follows:

Sec. 61.55 Waste classification.

(a) * * *

(2) * * *

(iv) Waste that is not generally acceptable for near-surface disposal is waste for which form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absense of specific requirements in this part, such waste must be disposed of in a geologic repository as defined in Part 60 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.

Dated at Rockville, Md. this 19th day of May, 1989.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.
INTERNAL DATA: FR Doc. 89-125; Filed 5-24-89; 8:45 am; BILLING CODE 7590-01-M

Citation 311

<DIALOG File 156: >
02288155 Subfile: NTIS-DE91007570
Title: First approximation for modeling the liquid diffusion pathway at the greater confinement disposal facilities.
Author: Olague NE; Price LL
Corporate Affiliation: Sandia National Labs., Albuquerque, NM.
Source: Govt Reports Announcements & Index (GRA&I), Issue 13, 1991
Language: UNSPECIFIED
Spon. Agency: Department of Energy, Washington, DC.
Contract Number: SAND-90-2342C, CONF-910270-7, Contract AC04-76DP00789
Order Info.: NTIS/DE91007570, 28p NTIS Prices: PC A03/MF A01
Journal Announcement: 9112
Descriptors/Keywords: Ground Water; Intermediate-Level Radioactive Wastes, Classification, Diffusion; Environmental Exposure Pathway, Fick Laws, High-Level Radioactiive Wastes, Implementation, Mathematical Models, Natural Convection, Nevada Test Site, Porosity, Radiation Doses, Radioactive Waste Disposal; Radionuclide

Migration, Sandia Laboratories, Site Characterization, Time Dependence, Transuranium Compounds, US DOE, US EPA, WIPP, Yucca Mountain, Meetings

Citation 312

<DIALOG File 156: >
01952445 Subfile: NTIS-DE85016423
Title: Evaluation of the Waste Isolation Pilot Plant Classification of Systems, Structures and Components.
Author: Anon
Tenera Corp., Berkeley, CA.
Source: Govt Reports Announcements & Index (GRA&I), Issue 02, 1986
Language: UNSPECIFIED
Spon. Agency: Department of Energy, Washington, DC.
Contract Number: EEG-30, Contract AC04-78AL10752
Order Info.: NTIS/DE85016423, Portions of this document are illegible in microfiche products., 64p NTIS Prices: PC A04/MF A01
Journal Announcement: 8604
Descriptors/Keywords: WIPP, Alpha-Bearing Wastes; Classification; Radioactive waste disposal

Citation 313

<DIALOG File 156: >
01939617 Subfile: CIS-83-02052
Title: Hospital waste
Author: Jacquerye R
Source: Promosafe Apr. 1983, Vol.10, No.67, p.18-23. 5 ref.
Language: FRENCH
Document Type: JOURNAL ARTICLE
Classification Code: 300
Journal Announcement: 8411
Descriptors/Keywords: waste disposal; hospitals; health engineering disposal of harmful waste; disposal of radioactive waste; housekeeping belgium; legislation; infection control; safety and health training; ILO

Citation 314

<DIALOG File 41: (c) Cambridge Scientific Abs.>
062927 79-07372
Title: Nuclear waste management legislation on administration agenda for 1979.
Author: Kane, J. T.
Journal: Professional Engineer, 2029 K St., NW, Washington, DC 20006
PROFESSIONAL ENGINEERING 49(1), 25-26, Publ.Yr: Jan. 1979 Coden: PENRB6
Note: illus. no refs.
Languages: ENGLISH
Doc Type: JOURNAL PAPER
Abstract: The 1979 work plan for establishing a nuclear waste policy assigned key tasks to several federal agencies. Legislation was to be submitted by DOE to establish an Executive Planning Council and a NRC licensing authority for transuranic waste disposal and to authorize DOE to accept responsibility for low-level waste burial sites voluntarily transferred from states to DOE. With the NRC, DOE was also to enact pending legislation for active and abandoned mills. The publishing of a final generic EIS for commercial waste management was DOE's responsibility as well. The NRC was to publish a final generic EIS and updated regulations on U mill tailings, promulgate a waste classification system study as a basis for NRC standards and establish criteria, and propose procedures and technical requirements for licensing geologic repositories. EPA was to promulgate environmental protection criteria for radioactive waste and the Waste Standards Rationale document, and a high-level waste numerical standard. (FT)
Descriptors: federal agencies; federal policies; radioactive wastes legislation; waste disposal; federal regulations; EPA
Identifiers: NRC; DOE

Citation 315

<DIALOG File 41: (c) Cambridge Scientific Abs.>
057945 79-02384
Title: Research and development in the UK on the treatment, conditioning, and storage of solid alpha-bearing waste and cladding hulls.
Author: Keen, N. J.

Affiliation: AERE, Harwell, Didcot, Oxon, OX11 ORA, Eng.
Note: The treatment, conditioning and storage of solid alpha-bearing waste and cladding hulls Paris Dec. 5-7, 1977
The treatment, conditioning and storage of solid alpha-bearing waste and cladding hulls: Proceedings of a technical seminar Publ.Yr: 1978 pp. 53-56
Publ: Paris Organisation for Economic Cooperation and Development
Note: no refs.
Languages: ENGLISH
Doc Type: CONFERENCE PAPER
Abstract: Plutonium contaminated materials arise from Pu processing and handling operations, and from contaminated processing equipment. Waste categorization is invaluable in quantifying waste management problems. Methods for waste minimization have been developed. Abrasive blasting, crushing and grinding, electropolishing, and ultrasonic cleaning are effective in treating noncombustible wastes. Combustible wastes are incinerated. A process was developed for leaching Pu from incinerator ash with incorporation in an aluminosilicate brick for canning and disposal. Acid digestion, low temperature pyrolysis, and polymers are being investigated. Methods for measuring the Pu content of wastes include low resolution high efficiency c spectrometry, high resolution, low efficiency c spectrometry, neutron interrogation, direct neutron emission, and differential calorimetry. Processes are being developed for the decontamination and packaging of zircalloy cladding hulls and stainless steel hulls; emphasis is on identification of quantity and mode of retention of residual fuel and fission products in hulls, decontamination of hulls by leaching in agitated systems, mechanical compaction, and encapsulation. The composition and properties of insoluble residues from dissolution of oxide fuels are being studied. Programs on the design and installation of waste handling facilities and in-situ interim storage are underway. Field studies await the resolution of public objections. (FT)
Descriptors: united kingdom; plutonium; alpha radiation; radioactive wastes; nuclear fuels; solid wastes; waste disposal; measuring methods

Citation 316

<DIALOG File 41: (c) Cambridge Scientific Abs.>
056539 78-05729
Title: Back end LWR fuel cycle waste characterstics and their management costs.
Author: McKee, R. W.
Corporate Affiliation: Battelle Memorial Inst., P.O. Box 999, Pacific Northwest Labs., Richland, WA 99352
Location: American Nuclear Society topical meeting Savannah, Ga. Mar. 19-23, 1978
Back end of the LWR fuel cycle: Proceedings of the American Nuclear Society topical meeting Publ.Yr: 1978 pp. IX-11-IX-12
Publ: La Grange Park, Ill. American Nuclear Society
Note: Abs. only
Languages: ENGLISH
Doc Type: CONFERENCE PAPER
Abstract: The following 6 fuel cycle options are considered: once-through (throwaway); U only recycle with Pu discarded in the high-level waste; U only recycle with Pu stored; U and Pu recycle; delayed once-through cycle and delayed U and Pu recycle. Waste management functions are waste treatment, interim storage, transportation, and final isolation. For the purposes of waste treatment, wastes are classified as high-level waste fuel residues (including fuel hulls and hardware); failed equipment and noncombustible-noncompactable waste; general trash and combustible wastes spent solvent; wet wastes; and particulate solids and off-gases. Two or more alternative treatments are evaluted for each waste classification. For the purposes of interim storage that may be required before a final repository is available, wastes are classified as solidified high-level wastes, packaged fuel residues, packaged intermediate-level waste, packaged low-level wastes, packaged plutonium oxide, and Kr gas cylinders. Both outdoor and indoor storage methods are evaluated for both on-site and off-site storage. For spent fuel storage, unpackaged storage in water basins and 4 alternative packaged storage concepts are evaluated. (AM)
Descriptors: nuclear fuels; radioactive wastes; waste management, economics; Storage; Waste disposal; Uranium; Plutonium; Waste recycling
Identifiers: abstract only

Citation 317

<DIALOG File 73: (COPR. ESP BV/EM 1993)>
7078182 EMBASE No: 88087172
Title: Comparisons of radioacive and chemical wastes
Author: Martin J.E.
Corporate Affiliation: School of Public Health, University of Michigan, Ann Arbor, MI 48109-2029 USA
Journal: HAZARD. WASTE HAZARD. MATER. (USA), 1988, 5/1 (73-84)
CODEN: HWHME
ISSN: 0882-5696
LANGUAGES: English
SUBFILES: 023; 046; 052
Abstract: Radioactive and chemical wastes represent a wide range of technical and policy issues, with numerous similarities and differences. The transfer of information from one to guide control decisions and policies for the other has been minimal perhaps because of perspective. Study of the features of these two waste categories

indicates that radioactive waste management could profit from the siting and waste categorization approaches used for chemical wastes; industrial waste management could profit from the experience base developed for radioactive wastes on approaches used in risk assessment, control of bulk wastes, and use of geologic isolation for highly toxic wastes.
EMTAGS: Theoretical study 0110; Nonhuman 0777; Methodology 0130; Chemical procedures 0107; Apparatus, equipment and supplies 0510
MEDICAL DESCRIPTORS: *risk assessment; *radioactive waste; *chemical waste; *waste disposal; *waste management

Citation 318

<DIALOG File 109: >
676200 NSA-25-023697
Title: ANSI N 5.8 1967.
Publication Date: 1967 7 p.
Publ: 1971
Journal Announcement: NSA25
Availability: American National Standards Inst., New York.
Document Type: Book
Language: English
Subfile: NSA (Nuclear Science Abstracts)
Descriptors: radioactive wastes; standards
Subject Headings/Modifiers: STANDARDS/radioactive waste categorization proposals, ANSI N 5.8
RADIOACTIVE WASTE/categorization of, standard for proposed definition of Subject Codes (NSA): N20540* Chemistry--Radiochemistry & Nuclear Chemistry--Radioactive Waste Treatment; N24700 Engineering--Radioactive Material Handling

Citation 319

<DIALOG File 109: >
631082 NSA-24-031644
Title: Standardization of radioactive waste categories. Technical Reports Series No. 101. Report of a Panel held in Vienna, 6--10 November 1967. International Atomic Energy Agency, Vienna (Austria)
Corp. Source Code: 4188000
Publication Date: 1970 18 p.
Primary Report No.: STI/DOC--10/101
Note: UNCL
Journal Announcement: NSA24
Availability: IAEA $1.00. Dep.
Document Type: Report
Language: English
Subfile: NSA (Nuclear Science Abstracts)
Descriptors: contamination; radioactive wastes; radioactivity; safety standards
Subject Headings/Modifiers: RADIOACTIVE WASTE/classification of, proposed IAEA categories for
Subject Codes (NSA): N24700* Engineering--Radioactive Material Handling

Citation 320

<DIALOG File 109: >
607063 NSA-24-007614
Title: CLASSIFICATION OF INDUSTRIAL RADIOACTIVE WASTES.
Author: Branca, G.; Gera, F.
Affiliation: Comitato Nazionale per l'Energia Nucleare, Rome (Italy)
Corp. Source Code: 2211000
Publication Date: 1969 19 p.
Primary Report No.: RT/PROT--(69)21
Secondary Report No.: CONF-690328--1
Note: From 4th Conference of the National Society of Sanitary Engineers, Milan, Italy.
Note: UNCL
Journal Announcement: NSA24
Availability: Dep. CFSTI (U. S. Sales Only).
Document Type: Report
Language: Italian
Subfile: NSA (Nuclear Science Abstracts)
Descriptors: documentation; industry; radioactive wastes; safety; standards
Subject Headings/Modifiers: safety/radioactive waste classification standards for radioactive waste/classification of industrial, standards for
Subject Codes (NSA): N24700* Engineering--Radioactive Material Handling

Citation 321

<DIALOG File 109: >
497573 NSA-22-051083
Title: Proposed definition of radioactive waste categories: a summary of a USASI standard.
Author: Blanco, R.E.
Journal: Nucl. Safety, 9: 515-20(Nov.-Dec. 1968).
Publication Date: 1968
Journal Announcement: NSA22
Document Type: Journal Article
Language: English
Subfile: NSA (Nuclear Science Abstracts)
Descriptors: safety; standards; waste disposal; waste processing; waste solutions
Subject Headings/Modifiers: radioactive waste/classification of, proposed definitions of categories for
Subject Codes (NSA): N20540* Chemistry--Radiochemistry & Nuclear Chemistry--Radioactive Waste Treatment

Citation 322

<DIALOG File 654: >
02106716 DIALOG File 654: U.S. Patents-Full Text (1990-) Reissue
Title: Disposable hazardous and radioactive liquid aqueous waste composition and method
PATENT NO.: RE34,041
ISSUED: August 25, 1992 (19920825)
INVENTOR(s): Doan, Darryl J., Laurel, MT (Montana), US (United States of America)
ASSIGNEE(s): Ayres, James William, (A U.S. Individual), Las Vegas, NV (Nevada), US (United States of America)
Rowsell, Farrell D, (A U.S. Individual), Las Vegas, NV (Nevada), US (United States of America)
APPL. NO.: 7-598,908
FILED: October 16, 1990 (19901016)
REFERENCE TO OTHER APPLICATIONS: This is a continuation of co-pending application Ser. No. 06-821,906, filed Jan. 23, 1986, now abandoned, and a continuation-in-part of my application Ser. No. 818,323, filed Jan. 13, 1986, now abandoned.
U.S. CLASS: 252-628 cross ref: 210-680; 210-681; 210-682; 210-691; 210-7 51; 210-908; 210-909; 210-910; 252-631; 252-633; 405-128; 405- 129
INTL CLASS: [5] G21F 9-16; G21F 9-08; C02F 1-42; C02F 1-68
FIELD OF SEARCH: 252-628; 252-631; 252-633; 252-626; 210-680; 210-681; 210- 682; 210-691; 210-751; 210-908; 210-909; 210-910; 405-128; 405 -129

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U.S. PATENT DOCUMENTS

3,167,504 1/1965 Hayden et al. 252-631
3,196,106 7/1965 Haden et al. 252-628
3,227,657 1/1966 Haden et al. 252-315.2
3,274,784 9/1966 Shock et al. 252-628
3,487,928 1/1970 Canevari 210-682
4,113,504 9/1978 Chen et al. 106-97
4,425,244 1/1984 House 252-28
4,439,062 3/1984 Kingsbury 405-35
4,464,274 8/1984 House 252-28
4,473,477 9/1984 Beall 210-691
4,528,129 7/1985 Manchak 252-628
4,615,809 10/1986 King 210-751
4,650,590 3/1987 Beall 210-691

OTHER REFERENCES: Hurlbut et al. 1977, Manual of Mineralogy-19th Edition, John Wiley & Sons, New York, pp. 402-403.
PRIMARY EXAMINER: Hunt, Brooks H.
ASST. EXAMINER: Mai, Ngoclan T.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 15
EXEMPLARY CLAIM: 15
ART UNIT: 224
ABSTRACT: An improved method of disposing of radioactive or hazardous liquid aqueous waste compositions having a substantial amount of dissolved solids comprises mixing the liquid under a high mechanical shear with a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof. Water soluble or miscible organic liquids as well as liquid hydrocarbon mixtures thereof may also be solidified by utilizing the aforesaid clays together with an organic ammonium montmorillonite having at least 10 carbon atoms, the amount of montmorillonite used being proportional to the amount of liquid hydrocarbon present.

I claim:

1. A method of disposing of radioactive or hazardous liquid wastes comprising a water soluble or miscible organic liquid, an aqueous solution having a dissolved solids content of about 5,000 parts per million or more, and mixtures thereof comprising adding thereto between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of said liquid and stirring the mixture under high mechanical shear until it is substantially solidified.

2. The method of claim 1 wherein said composition is subjected to high shear stirring of at [lease] (italic start) least (italic end) about 500 rpm.

3. The method of claim 1 wherein said composition is subjected to high shear stirring of at least about 1,000 rpm.

4. A method of disposing of radioactive or hazardous water soluble or miscible organic liquids and having between about 5% and about 95% liquid hydrocarbon by volume, comprising mixing said liquid with a mixture of clay selected from the group attapulgite, sepiolite, and mixtures thereof and an organic ammonium montmorillonite having at least 10 carbon atoms at a ratio of clay:organic ammonium montmorillonite about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, by volume, respectively, and wherein the amount of said clay and organic ammonium montmorillonite mixture is between about 2.5 and about 5.5 pounds per gallon of total bulk liquid, and stirring the mixture under high mechanical shear until it is substantially solidified.]

5. [The method of claim 4 including adding] (italic start) A method of disposing of radioactive or hazardous water soluble or miscible organic liquids and having between about 5% and about 95% liquid hydrocarbon by volume, comprising mixing said liquid with a mixture of clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof and an organic ammonium montmorillonite having at least 10 carbon atoms, at a ratio of clay:organic ammonium montmorillonite about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, by volume, respectively, and wherein the amount of said clay and organic ammonium montmorillonite mixture is between about 2.5 and about 5.5 pounds per gallon of total bulk liquid, and (italic end) between about 1 and about 10% by volume of a polar organic compound based on the hydrocarbon [.] (italic start), and stirring the mixture under high mechanical shear until it is substantially solidified. (italic end)

[6. The method of claim 4 including adding] (italic start) A method of disposing of radioactive or hazardous water soluble or miscible organic liquids and having between about 5% and about 95% liquid hydrocarbon by volume, comprising mixing said liquid with a mixture of clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof and an organic ammonium montmorillonite having at least 10 carbon atoms, at a ratio of clay:organic ammonium montmorillonite about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, by volume, respectively, and wherein the amount of said clay and organic ammonium montmorillonite mixture is between about 2.5 and about 5.5 pounds per gallon of total bulk liquid, and (italic end) between about 1 and about 10% of an alcohol having between 1 and 3 carbon atoms based on the hydrocarbon [.] (italic start), and stirring the mixture under high mechanical shear until it is substantially solidified. (italic end)

7. A method of disposing of an aqueous radioactive or hazardous liquid having a dissolved solids content of between about 5,000 and about 30,000 parts per million comprising adding thereto a mixture of between about 55% and about 95% of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof and between about 5% and about 45%, by weight, sodium montmorillonite having sodium as the major exchangeable cation, said mixture added in an amount of between about 1.5 and about 4.0 pounds per gallon of said liquid, and stirring the mixture under high mechanical shear until it is substantially solidified.

8. A substantially solidified hazardous or radioactive composition consisting essentially of water soluble or miscible organic liquid, an aqueous solution having a dissolved solids content of at least about 20,000 parts per million, and mixtures thereof, and between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of liquid.

9. The composition of claim 8 wherein said water soluble or miscible organic liquid is selected from the group consisting of polyhydric alcohols, glycyerols, and plyalkylene glycols.

10. A substantially solidified hazardous or radioactive composition consisting essentially of an aqueous solution having between about 5,000 and about 30,000 parts per million dissolved solids and a mixture of between about 55% and about 95% by weight of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof, and between about 5% and about 45%, by weight sodium montmorillonite having sodium as the major cation said mixture of said clay and sodium montmorillonite being present in an amount of between about 1.5 and about 4.0 pounds per gallon of said liquid.

11. The composition of claim 10 including between about 5 and about 95% by volume based on said aqueous solution of a water soluble or miscible organic waste liquid selected from the group consisting of aldehydes, ketones, acids, ethers, esters, alcohols, polyols and polyglycols.

[12. A substantially solidified hazardous or radioactive composition consisting essentially of a water soluble or miscibel organic liquid and a liquid hydrocarbon and a mixture of a clay selected from the group consisting

of attapulgite, sepiolite, and mixtres thereof and an organic ammonium montmorillonite having at least 10 carbon atoms wherein said amount of said clay and said organic ammonium montmorillonite is between about 2.5 and about 5.5 pounds
per gallon of said liquid.]

[13. The composition of claim 12 wherein the liquids comprise between about 5% and about 95% organic liquid and between about 5% and about 95% liquid hydrocarbon, by volume, and wherein the ratio of said clay:organic ammonium montrmorillonite is about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, respectively.]

14. The method of claim 1 including substituting between about 5 and about 45% of said clay with sodium montmorillonite. (italic start)

15. A method of disposing of radioactive or hazardous liquid wastes comprising a water soluble or miscible organic liquid, an aqueous solution and mixtures thereof comprising adding thereto between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of said liquid and stirring the mixture under high mechanical shear until it is substantially solidified. (italic end) (italic start)
16. A method of disposing of an aqueous radioactive or hazardous liquid comprising adding thereto a mixture of between about 55% and about 95% of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof and between about 5% and about 45%, by weight, sodium montmorillonite having sodium as the major exchangeable cation, said mixture added in an amount of between about 1.5 and about 4.0 pounds per gallon of said liquid, and stirring the mixture under high mechanical shear until it is substantially solidified. (italic end) (italic start)

17. A substantially solidified hazardous or radioactive composition consisting essentially of water soluble or miscible organic liquid, an aqueous solution, and mixtures thereof, and between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of liquid. (italic end) (italic start)

18. A substantially solidified hazardous or radioactive composition consisting essentially of an aqueous solution and a mixture of between about 55% and about 95% by weight of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof, and between about 5% and about 45%, by weight sodium montmorillonite having sodium as the major cation said mixture of said clay and sodium montmorillonite being present in an amount of between about 1.5 and 4.0 pounds per gallon of said liquid.

Citation 323

<DIALOG File 654: >
02083468 DIALOG File 654: U.S. Patents-Full Text (1990-) Reissue
Title: Hazardous and radioactive liquid waste disposal method
PATENT NO.: RE33,955
ISSUED: June 09, 1992 (19920609)
INVENTOR(s): Rowsell, Farrell D., 2665 Belcastro St., Las Legas, NV (Nevada), US (United States of America), 89117 Ayres, James W., 5633 W. Palmyra, Las Vegas, NV (Nevada), US (United States of America), 89102
APPL. NO.: 7-595,250
FILED: October 03, 1990 (19901003)
U.S. CLASS: 252-628 cross ref: 252-631; 106-286.7; 106-286.8; 106-287.1 210-679; 210-680; 210-691; 210-909; 405-128; 405-129
INTL CLASS: [5] G21F 9-16; G21F 9-08
FIELD OF SEARCH: 252-628; 252-631; 106-286.7; 106-286.8; 106-287.1; 210-679; 210-680; 210-691; 210-909; 405-128; 405-129

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3,167,504 1/1965 Hayden et al. 252-628
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3,196,619 7/1965 Shock 252-628
3,274,784 9/1966 Shock et al. 252-628
3,487,928 1/1970 Canevari 210-682
3,956,040 5/1976 Tezuka 252-8.511
3,974,125 8/1976 Oswald et al. 525-531
4,028,265 6/1977 Barney et al. 252-628
4,087,375 5/1978 Tanno 252-631
4,113,504 9/1978 Chen et al. 252-628
4,149,968 4/1979 Kupiec et al. 210-665
4,378,249 3/1983 Beall et al. 106-74
4,422,855 12/1983 Sawyer, Jr. 44-51

4,439,062 3/1984 Kingsbury 405-24
4,442,241 4/1984 Drake 523-130
4,454,055 6/1984 Richman 252-194
4,473,477 9/1984 Beall 210-691
4,517,112 5/1985 Mardis et al. 252-315.2
4,528,129 7/1985 Manchak 252-628
4,615,809 10/1986 King 210-751
4,650,590 3/1987 Beall 210-691

OTHER REFERENCES: Hurlbut et al. 1977, Manual of Mineralogy-19th edition, John Wiley and Sons, New York, pp. 402-403.

PRIMARY EXAMINER: Hunt, Brooks H.
ASST. EXAMINER: Mai, Ngoclan T.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 7
EXEMPLARY CLAIM: 7
ART UNIT: 224

ABSTRACT: An improved method of disposing of radioactive or hazardous liquids comprises placing the liquids in a container and adding a sodium montmorillonite over intervals until the composition is substantially solid in the container.

We claim:

1. An improved method of solidifying a radioactive or hazardous liquid comprising placing said liquid in a container and adding only sodium montmorillonite to said liquid in a ratio of sodium montmorillonite:liquid of between about 3:1 and 1:7, respectively, until the composition comprises an unpourable, free standing solid.

2. A method of solidifying a radioactive or hazardous liquid comprising at least about 95% water by adding only sodium montmorillonite having a major portion of particles between about 3/8 inch and 20 mesh thereto in a sodium montmorillonite:liquid ratio of between about 1:2 and about 1:7, respectively, in fractions with at least a few minutes interval between fractions, until the composition comprises [an unpourable,] (italic start) a (italic end) free standing solid.

3. The method of claim 2 wherein each of said fractions is between about 10 and 50% of the total amount added.

4. The method of claim 2 wherein each of said fractions is between about 1/3 and 1/4 of the total amount added and wherein the intervals between fraction additions is at least about 10 minutes.

5. The method of claim 2 comprising placing between about 40 and 50 gallons of said liquid in a 55 gallon drum, and adding between about 150 and about 175 pounds of sodium montmorillonite to said liquid in fractions of between about 40 and about 55 pounds with at least about 10 minute intervals between fractions.

6. A method of solidifying a radioactive or hazardous liquid comprising at least about 5% hydrocarbon by adding only sodium montmorillonite having a major portion of particles of about 200 mesh or smaller thereto in a sodium montmorillonite:liquid ratio of between about 1:2 and 3:1, respectively, with stirring, until the composition comprises [an unpourable,] (italic start) a (italic end) free standing solid. (italic start) 7. An improved method of solidifying a radioactive or hazardous liquid comprising adding only sodium montmorillonite to said liquid in a ratio of sodium montmorillonite:liquid of between about 3:1 and 1:7, respectively, until the composition comprises a free standing solid.

Citation 324

<DIALOG File 654: >
02072553 DIALOG File 654: U.S. Patents-Full Text (1990-) Reissue
Title: Disposable hazardous and radioactive liquid hydrocarbon waste composition and method
PATENT NO.: RE33,915
ISSUED: May 05, 1992 (19920505)
INVENTOR(s): Doan, Darryl J., Laurel, MT (Montana), US (United States of America)
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APPL. NO.: 7-598,907
FILED: October 16, 1990 (19901016)

This is a continuation of co-pending application Ser. No. 06-818,323, filed on Jan. 13, 1986 (abandoned).

U.S. CLASS: 252-631 cross ref: 252-628; 252-633; 252-634; 252-635; 210-682; 210-691; 210-751; 210-908; 210-909; 405-128; 405-129
INTL CLASS: [5] G21F 9-08; G21F 9-16
FIELD OF SEARCH: 252-631; 252-628; 252-634; 252-635; 252-633; 210-682; 210-691; 210-781; 210-908; 210-909;

405-128; 405-129

References Cited

U.S. PATENT DOCUMENTS
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3,948,770 4/1970 Goodrich et al. 210-40
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4,425,244 1/1984 House 252-28
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NON-U.S. PATENT DOCUMENTS

1280373 7/1972 GB (United Kingdom)
OTHER REFERENCES: Hurlbut et al., 1977 Manual of Mineralogy, 19th edition, John Wiley and Sons, New York, pp. 402-403.
PRIMARY EXAMINER: Hunt, Brooks H.
ASST. EXAMINER: Mai, Ngoclan T.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 11
EXEMPLARY CLAIM: 9
ART UNIT: 224

ABSTRACT: An improved method of disposing of radioactive or hazardous liquid hydrocarbon compositions comprises placing the liquid hydrocarbons in a container and adding an organic ammonium montmorillonite in ratios of between about 1:2 and 3:1, by volume, respectively. The organic ammonium montmorillonite has at least 10 carbon atoms. A polar organic compound having between 1 and about 10 carbon atoms is also preferably added with the montmorillonite. Where the liquid waste material includes 5% or more of water in addition to the liquid hydrocarbon a minus 200 mesh sodium montmorillonite is also preferably added.

I claim:

1. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon composition comprising placing said radioactive or hazardous liquid hydrocarbon composition in a container and mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms until the composition comprises an unpourable, free standing solid.

2. The method of claim 1 wherein said organic ammonium montmorillonite comprises a quaternary ammonium montmorillonite.

3. A solidified hazardous or radioactive liquid hydrocarbon composition consisting essentially of said liquid hydrocarbon, an organic ammonium montmorillonite having at least 10 carbon atoms, and a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms, the ratio of said liquid hydrocarbon and said organic ammonium montmorillonite being between about 1:2 and about 3:1, by volume, respectively, and said alcohol being between about 1 and about 10% by volume of said liquid hydrocarbon and wherein said composition comprises an unpourable, free standing solid.

4. A method of disposing of a hazardous or radioactive liquid composition consisting essentially of between about 5 and about 95% liquid hydrocarbon [nd] (italic start) and (italic end) between about 95 and about 5% water, by volume, respectively, comprising placing said liquid in a container, adding between about 2.3 and about 4.6 pounds of a mixture of an organic ammonium montmorillonite and sodium montmorillonite of at least 50% minus 200 mesh particle size per gallon of said liquid composition wherein the ratio of said organic ammonium montmorillonite: sodium montmorillonite is about directly proportional to the ratio of liquid hydrocarbon:water, by volume, respectively, and between 1 and about 10% aliphatic alcohol having between 1 and 8 carbon atoms based on the volume of said liquid hydrocarbon, while stirring to achieve an unpourable, free standing solid.

5. A solidified hazardous or radioactive liquid composition consisting essentially of a waste portion of between about 5 and about 95% liquid hydrocarbon and between about 95 and about 5% water, by volume, respectively, between about 2.3 and about 4.6 pounds of a mixture of an organic ammonium montmorillonite and sodium montmorillonite having a nominal particle size of minus 200 mesh per gallon of said waste portion, the ratio of organic ammonium montmorillonite:sodium montmorillonite being about directly proportional to the ratio of liquid hydrocarbon:water, by volume, respectively, and between 1 and about 10% aliphatic alcohol having between 1 and 8 carbon atoms based on the volume of said liquid hydrocarbon and wherein said composition comprises an unpourable, free standing solid.

6. The composition of claim 5 wherein said organic ammonium montmorillonite has at least 10 carbon atoms.

7. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon comprising placing said radioactive or hazardous liquid hydrocarbon composition in a container and mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight polar organic compound having between 1 and about 10 carbon atoms selected from the group consisting of aliphatic ketones, aliphatic acetates and aliphatic alcohols until the composition is substantially solid.

8. The method of claim 7 wherein said polar organic compound is selected from the group consisting of isopropyl alcohol, hexyl alcohol, ethyl acetate and methyl ethyl ketone. (italic start)

9. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon composition comprising mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms until the composition comprises a free standing solid. (italic end) (italic start)

10. A method of disposing of a hazardous or radioactive liquid composition consisting essentially of between about 5 and about 95% liquid hydrocarbon and between about 95 and about 5% water, by volume, respectively, comprising adding between about 2.3 and about 4.6 pounds of a mixture of an organic ammonium montmorillonite and sodium montmorillonite of at least 50% minus 200 mesh particle size per gallon of said liquid composition wherein the ratio of said organic ammonium montmorillonite:sodium montmorillonite is about directly proportional to the ratio of liquid hydrocarbon:water, by volume, respectively, and between 1 and about 10% aliphatic alcohol having between 1 and 8 carbon atoms based on the volume of said liquid hydrocarbon, while stirring to achieve a free standing solid. (italic end) (italic start)

11. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon comprising mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight polar organic compound having between 1 and about 10 carbon atoms selected from the group consisting of aliphatic ketones, aliphatic acetates and aliphatic alcohols until the composition is substantially solid. (italic end)

Citation 325

<DIALOG File 655: (c) 1992 BNA, Inc.>
00498983 DIALOG File 655: BNA DAILY NEWS
BNA national environment daily (Copr.) BNA, Inc.
May 10, 1993

Radioactive Waste
Generic NRC decommissioning standards urged by diverse workshop attendees

Citation 326

<DIALOG File 655: (c) 1992 BNA, Inc.>

00328403 DIALOG File 655: BNA DAILY NEWS
BNA environmental law update (copr.) Bna, inc.; formerly Bna environment daily
December 18, 1991

Radioactive Waste
Report says scrap current program, start planning for on-site storage

Citation 327

<DIALOG File 655: (c) 1992 BNA, Inc.>
00326420 DIALOG File 655: BNA DAILY NEWS
BNA environmental law update (Copr.) BNA, Inc.; formerly BNA environment daily
December 12, 1991

Radioctive Wastes
Private-sector report calls for revamping handling of radioactive wastes

Citation 328

<DIALOG File 102: (c) 1993 CIS>
084670 ASI ACCESSION NUMBER: 83-3354-5
TITLE: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics (Radioactive waste and spent fuel generation and sources, shipping costs, disposal sites and costs, and inventories, as of 1982 with projections to 2020, annual rpt)
CORPORATE SOURCE: Department of Energy: Nuclear Energy
SOURCE: Annual Sept. 1983 PAGES: xx+299 p. +; NTIS, price not given
FICHE: 6
SUPERINTENDENT OF DOCUMENTS CLASS NUMBER: E1.68:0017/2
REPORT NUMBER: DOE/NE-0017/2
DOCUMENT TYPE: ANNUAL
JOURNAL ANNOUNCEMENT: 8311
ABSTRACT: Fourth annual report on spent fuel and radioactive waste generation and sources, disposal sites, and inventories as of Dec. 31, 1982, with selected trends and projections to 2020. Inventory data throughout show volume, mass, radioactivity, thermal power, and annual accumulation rates. Report covers inventories at each of the 6 DOE disposal sites and 5 commercial sites, as applicable. Also covers radioactivity at active uranium mills and formerly used nuclear sites. Data are from DOE field office reports to the Oak Ridge National Laboratory Integrated Data Base, radiological surveys of inactive nuclear facilities, and numerous other sources. EIA projections of commercial nuclear energy growth and defense-related and other activities are used to project future waste and spent fuel generation. Spent fuel sources are commercial boiling and pressurized light-water reactors (LWRs) and special research and test reactors sponsored by Government, industry, and universities. Waste classifications are high-level and transuranic (TRU), mostly from defense activities and fuel reprocessing; low-level (LLW), from fuel fabrication and enrichment, LWR operation, research and medical processes (institutional), and Government defense and R&D activities; uranium mill tailings; material resulting from clean-up of contaminated sites (remedial action); and airborne particulates. Current data are as of Dec. 31, 1982, and projections are for each year 1983-2020, unless otherwise noted.
Contents:
Chapter 0. Summary. Includes 6 charts and 3 tables showing projection assumptions, and spent fuel and waste inventories. (p. 1-13)

Chapter 1. Spent fuel. Includes map, 4 charts, and 17 tables showing projected installed nuclear capacity, spent fuel inventory, fissile fuel demand, and burnup of commercial spent fuel, by reactor type, with trends from 1960; characteristics of shipping casks and fuel assemblies; and name, description, container and fuel element material and dimensions, processing schedule, and radioactivity of special reactor fuel. (p. 15-50)

Chapter 2. High-level waste. Includes 1 map, 5 charts, and 19 tables showing current and projected inventory data, including average chemical composition and physical properties, total commercial and for DOE by site, variously by waste form, radionuclide, and element, selected years 1982-2020. (p. 53-87)

Chapter 3. TRU waste. Includes 2 maps, 6 charts, and 20 tables showing inventory data for contact- and remote-handled waste and buried waste, and volume of contaminated soil, at DOE and commercial sites, selected years 1944-2020; isotopic and physical composition for DOE sites; shipments from DOE sites, 1988-2006; volume of storage and transportation containers; and average rate of generation for contract- and remote-handled waste at 20 sites, 1983-92. (p. 89-125)

Chapter 4. LLW. Includes 4 maps, 5 charts, and 25 tables showing inventory data, by source and LWR type; available and utilized land at DOE and commercial sites; ocean and other disposal of LLW, by site, various periods 1962-82; LLW shipments, by source, waste form, LWR type, and State, various periods 1978-82; and LLW characteristics, by source, various periods 1943-82. (p. 127-168)

Chapter 5. Uranium mill tailings. Includes 1 map, 2 charts, and 5 tables showing tailings inventory; location, operating company, daily capacity, tailings pond area, and tailings characteristics including amount from Government contracts, for 26 operating mills by State; and milling rates and uranium recovery, 1973-82. (p. 169-179)

Chapter 6. Airborne waste. Includes 7 tables showing inventory from commercial reprocessing, selected years 1989-2020; nuclear properties; and annual release rates for 16 DOE facilities and 5 reactor types; for 3-4 isotopes. (p. 181-188)

Chapter 7. Remedial action waste. Includes 3 maps, 3 charts, and 7 tables showing current inventory of soil, rubble, metal, and other LLW and TRU waste, and dates of scheduled remedial action, by type of site, field office, project, and State. (p. 189-218)

Chapter 8. Decommissioning commercial facilities. Includes 5 tables showing typical capacity and waste generated, total and for selected fuel cycle facilities; and scheduled reactor shutdowns, by reactor type selected years 1974-2020. (p. 219-227)

Chapter 9. Management and disposal costs. Includes 1 chart and 15 tables showing storage, processing, transportation, management, and disposal costs, by waste type, in 1983-84 dollars; and LLW disposal fees, for 3 facilities, selected dates Jan.-Mar. 1983. (p. 229-249)

App. A-B. Waste stream composition and source terms; and characteristics of selected radionuclides. Includes 12 flow charts and 22 tables. (p. 251-278)

App. C. Spent fuel and HLW projected cooling age at time of emplacement
and inventories. Includes 8 charts. (p. 279-289)
Distribution list. (p. 291-299)

DESCRIPTORS: radioactive waste; nuclear power; nuclear weapons projections; land use; energy research and development; research; medical research; defense research; soil pollution; marine pollution; freight business income and expenses, specific industries

CATEGORIES: Individual Company or Institution

Citation 329

<DIALOG File 102: (c) 1993 CIS>
075590 ASI ACCESSION NUMBER: 82-3354-5
TITLE: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics (Radioactive waste and spent fuel generation and sources, shipping costs, disposal sites and costs, and inventories, as of 1981 with projections to 2020, annual rpt)
CORPORATE SOURCE: Department of Energy: Nuclear Energy
SOURCE: Annual Oct. 1982 PAGES: xxiv+341 p. +; NTIS, price not given
FICHE: 6 ITEM NO: 474-B
SUPERINTENDENT OF DOCUMENTS CLASS NUMBER: E1.68:0017-1 REPORT NUMBER:
DOE/NE-0017/1
DOCUMENT TYPE: ANNUAL
JOURNAL ANNOUNCEMENT: 8210
ABSTRACT: Third annual report on spent fuel and radioactive waste generation and sources, disposal sites, and inventories as of Dec. 31, 1981, with selected trends and projections to 2020. Inventory data presented throughout are volume, mass, radioactivity, thermal power, and annual accumulation rates. Report covers inventories at each of the 8 DOE disposal sites and 6 commercial sites, as applicable. Also covers radioactivity at active uranium mills and formerly used nuclear sites. Data are from DOE field office reports to the Oak Ridge National Laboratory Integrated Data Base, radiological surveys of inactive nuclear facilities, and numerous other sources. Report uses models of nuclear energy development, spent fuel discharges, and isotope generation and depletion to project future inventories. Spent fuel sources are commercial boiling and pressurized light-water reactors (LWRs) and special research and test reactors sponsored by Government, industry, and universities. Waste classifications are high-level and transuranic (TRU), mostly from defense activities and fuel reprocessing; low-level (LLW), from fuel fabrication and enrichment, LWR operation, research and medical processes (institutional), and Government defense and R&D activities; uranium mill tailings; material resulting from clean-up of contaminated sites (remedial action); and airborne particulates. Current data are as of Dec. 31, 1981, and projections are for each year 1982-2020, unless otherwise noted.
Contents:
Chapter 0. Summary. Includes 6 charts and 3 tables showing projection assumptions, and spent fuel and waste inventories. (p. 1-17)

Chapter 1. Spent fuel. Includes map, 3 charts, and 15 tables showing projected installed nuclear capacity and spent fuel inventory, by reactor type, with trends from 1960; characteristics of shipping casks and fuel assemblies; and name, description, container and fuel element material and dimensions, processing schedule, and radioactivity of special reactor fuel. (p. 19-60)

Chapter 2. High-level waste. Includes 1 map, 4 charts, and 30 tables showing current and projected inventory data, including average chemical composition and density, total commercial and for DOE by site, variously by waste form, radionuclide, and element, selected years 1978-2020. (p. 61-107)

Chapter 3. TRU waste. Includes 1 map, 4 charts, and 18 tables showing inventory data for contact- and remote-handled waste and buried waste, and volume of contaminated soil, at DOE and commercial sites, selected years 1944-2020; isotopic and physical composition for DOE sites; shipments from DOE sites, 1989-2014; and average rate of generation for contact- and remote-handled waste at 21 sites, 1982-91. (p. 109-143)

Chapter 4. LLW. Includes 3 maps, 3 charts, and 41 tables showing inventory data by source, and available and utilized land at DOE and commercial sites, selected years 1962-2020; LLW generation by source and State, 1981; ocean and other disposal of DOE/defense LLW, various periods 1946-80; electricity generated and LLW characteristics and shipments, by LWR type, 1959-80; and forms, sources, volume, and shipments of institutional LLW. (p. 145-200)

Chapter 5. Remedial action waste. Includes 3 maps, 2 charts, and 18 tables showing current inventory of soil, rubble, metal, and other LLW and TRU waste, and dates of scheduled remedial action, by field office, project, and State. (p. 201-250)

Chapter 6. Uranium mill tailings. Includes 1 map, 2 charts, and 5 tables showing projected DOE and commercial tailings inventory; location, operating company, daily capacity, tailings pond area, and tailings characteristics including amount from Government contracts, for 26 operating mills by State; and milling rates and uranium recovery, 1973-81. (p. 251-263)

Chapter 7. Airborne waste. Includes 6 tables showing inventory from commercial reprocessing, selected years 1989-2020; nuclear properties; and annual release rates for 16 DOE facilities and 5 reactor types; for 2-5 isotopes. (p. 264-272)

Chapter 8. Decommissioning commercial facilities. Includes 2 tables showing, for selected fuel cycle facilities, typical capacity and waste generated; and scheduled reactor shutdowns, by reactor type; selected years 1976-2020. (p. 273-277)

Chapter 9. Management and disposal costs. Includes 6 tables showing spent fuel shipping costs by mode, and itemized costs for disposal and transportation of fuel reprocessing and TRU waste, in 1980-81 dollars; and LLW disposal fees, by waste volume and radioactivity level, for 3 facilities, 1982. (p. 278-294)

App. A-B. Waste stream composition and source terms; and characteristics of selected radionuclides. Includes 8 flow charts and 13 tables. (p. 296-322)

App. C. Commercial power plant projected demand for uranium milling and fuel fabrication and enrichment. Includes 4 tables. (p. 323-325)

App. D. Includes list of authors and Intergrated Data Base steering committee members. (p. 326-341)
Previous report, with data as of Dec. 31, 1980, was titled Spent Fuel and Radioactive Waste Inventories and Projections (see ASI 1981 Annual under this number).

DESCRIPTORS: radioactive waste; nuclear power; radioactive materials nuclear weapons; projections; land use; energy research and development research; medical research; defense research; soil pollution; marine pollution; freight; business income and expenses, specific industries
CATEGORIES: Individual Company or Institution

Citation 330

<DIALOG File 102: (c) 1993 CIS>
066806 ASI ACCESSION NUMBER: 81-3354-5
TITLE: Spent Fuel and Radioactive Waste Inventories and Projections As of Dec. 31, 1980 (Spent fuel and radioactive waste generation and sources, disposal sites, and inventories, as of 1980 and projected to 2000, annual rpt)
CORPORATE SOURCE: Department of Energy: Nuclear Energy
SOURCE: Annual Sept. 1981 PAGES: xvi+279 p. NTIS $21.50
FICHE: 5
REPORT NUMBER: DOE/NE-0017
DOCUMENT TYPE: ANNUAL
JOURNAL ANNOUNCEMENT: 8112
ABSTRACT: By Oak Ridge National Laboratory (ORNL). Second annual report on spent fuel and radioactive waste generation and sources, disposal sites, and inventories as of Dec. 31, 1980, and projected to 2000. Inventory data presented throughout are volume, mass, radioactivity, thermal power, and annual accumulation rates. Report covers inventories at each of the 9 DOE disposal sites and 6 commercial sites, as applicable. Also covers radioactivity at inactive uranium mills and formerly used nuclear sites. Data are from DOE field office reports to the ORNL Integrated Data Base, radiological surveys of inactive nuclear facilities, and various other sources. Report uses EIA models of nuclear energy development and ORNL models of spent fuel discharges and

isotope generation and depletion to project future inventories. Spent fuel sources are commercial boiling and pressurized light-water reactors (LWRs) and special research and test reactors sponsored by Government, industry, and universities. Waste classifications are high-level and transuranic, mostly from defense activities and fuel reprocessing; low-level (LLW), from fuel fabrication and enrichment, LWR operation, research and medical processes (institutional), and Government defense and R&D activities; uranium mill tailings; material resulting from clean-up of contaminated sites (remedial action); and airborne particulates. Current data are as of Dec. 31, 1980, and projections are for each year 1980-2000, unless otherwise noted.
Contents:
Chapter 1-2. Introduction and summary, including calculated volume and weight per metric ton of heavy metal and per gigawatt-years of electricity, for products of spent fuel reprocessing, with 11 charts and 15 tables. (p. 1-37)

Chapter 3-4. Spent fuel and high-level waste, including projected installed nuclear capacity; fuel assemblies discharged; and name, description, container or fuel element material and dimensions, processing schedule, and radioactivity of special reactor fuel; with 8 tables. (p. 38-56)

Chapter 5. Transuranic waste, including inventory data and volume of contaminated soil at DOE sites; amounts buried at commercial sites projected average rate of generation for contract- and remote-handled waste at 22 sites, 1981-90; and isotopic composition for DOE sites and all industrial waste; with 9 tables. (p. 57-75)

Chapter 6-7. LLW and remedial action waste, including forms, sources, and volume of institutional waste; current inventory data and available and utilized land at LLW sites; and projected DOE land use, selected years 1981-2000; with 14 tables. (p. 76-109)

Chapter 8. Active uranium mill sites, with 2 tables showing location operating company; maximum daily capacity; leaching process; tailings pond area; and tailings characteristics, including amount from Government contracts; for 22 operating mills, by State, 1979; and projected tailings inventory data. (p. 110-115)

Chapter 9. Airborne waste, with 4 tables showing nuclear properties, release rates for 16 DOE facilities and 4 types of reactor, and quantities in spent fuel from activation and fission in 4 types of reactor, for 4-5 isotopes. (p. 116-122)

App. A. Spent fuel, with 7 tables showing projected inventory data; and data by element and isotope, 1980 and 2000. (p. 124-148)

App. B. High-level waste, with 23 tables showing current and projected inventory data, including average chemical composition and density, variously by waste form, radionuclide, and element, selected years 1978-2000. (p. 149-177)

App. C. Transuranic waste, with 12 tables showing current and projected retrievable inventory data for contract- and remote-handled defense waste at DOE sites and for all industrial waste; and projected DOE land use, selected years 1985-2000. (p. 178-195)

App. D. LLW, with 15 tables showing electricity generated and LLW shipped, 1959-80, and LLW types and radioactivity, all by LWR type radioactive properties of institutional LLW; projected LLW characteristics, by source; and types and volume of Government LLW and volume of LLW added to DOE sites, annually 1979-81 and annual average 1982-2000. (p. 196-219)

App. E. Inactive uranium mill sites, with 3 tables showing process and date of last operation; volume, mass, area, pH, uranium content, and actinide thermal power and radioactivity, for tailings, contaminated soil, and other materials; and types, average, and range of tailings radioactivity, by date of survey, late 1970s-80; for 25 sites. (p. 220-239)

App. F. Formerly used production, storage, and other nuclear sites; with 9 tables showing location; historical and present use; area; survey date and type of amount of radioactivity present in soil, atmosphere, water, and parts of buildings, with comparisons to off-site soil; for sites in 9 States, late 1970s. (p. 240-260)

App. G. Remedial-action waste, with 2 tables showing estimated generation rate and volume of soil, rubble, metal, and other LLW and transuranic waste, and dates of scheduled remedial action, by field office, project, and State. (p. 261-267)

App. H. Includes list of authors and Integrated Data Base steering committee members. (p. 268-279) First annual report, titled Spent Fuel and Waste Inventories and Projections, with inventories as of Dec. 31, 1979, has also been received and is available on ASI microfiche under this number <Aug. 1980. viii+81 p. ORO-778. NTIS $9.50. ASI/MF/3>.
DESCRIPTORS: oak ridge national laboratory; radioactive waste power-generating plants and equipment; nuclear weapons; uranium projections; land use; energy research and development; research; medical research; defense research; soil pollution
CATEGORIES: Individual Company or Institution

Citation 331

<DIALOG File 194: >
1683286
Title: Develop a suitable waste classification sys commensurate with the potential hazard and adequate disposal methods
Abstract: The Nuclear Waste Policy Act of 1082 (NWRP) provided a general definition of High Level Waste (HLW). The NRC is presently considering rulemaking activities that would define ""other materials'' to be included in the definition. Organize a group of key representatives from industrial, federal, and other appropriate organizations to facilitate the exchange of ideas for the resolution of problems affecting mixed radioactive and hazardous wastes. The primary topics to be addressed are those associated with the disposal of hazadous radioactive and/or chemical wastes. Foster the definition and implementation of a classification sys for hazardous wastes, and explore methods of permanent disposal. Consider applicable environmental regulations and statutes included in the review process. Provide other technical support, as necessary, to ANL and DOE as assigned by ANL. The purpose of this announcement is to est a bidders list. Interested firms or individuals will be placed on the bidders list by requesting in writing, Attn; Robert Houghton, Bldg 201, PRO, BL003. This announcement closes 15 days after publication of this notice. (078)
SPONSOR: Argonne Nat'l Laboratory, Procurement Dept, 9700 South Cass ave., Argonne, IL 60439-4873
SUBFILE: PSE (U.S. Government procurements, services)
SECTION HEADING: H Expert and Consultant Services
PUBLICATION DATE: MARCH 24, 1987
ISSUE: PSA-9302

Citation 332

<DIALOG File 669: (c) U.S. Govt Printing Office>

00423724
Title: State of Maine: Staff Assessment of Proposed Agreement Between the Nuclear Regulatory Commission and the State of Maine, Vol. 56, No. 247, 56 FR 66654
Date: Tuesday, December 24, 1991
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Notices
Comments must be received on or before January 2, 1992.
CONTACT: Kathleen N. Schneider, State Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone: 301-492-0320. Submit comments to the Chief, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, Washington, DC 20555. Comments may also be delivered to 7920 Norfolk Avenue, Bethesda, Maryland from 7:30 a.m. to 4:15 p.m. Monday through Friday. Copies of comments received by NRC may be examined at the NRC Public Document Room, 2120 L Street, NW., (Lower Level), Washington, DC. A copy of the proposed agreement, program narrative, including the referenced appendices, applicable State legislation and Maine regulations, is available for public inspection in the NRC's Public Document Room, 2120 L Street, NW., (Lower Level), Washington, DC, telephone: (202) 634-3273. Notice of Proposed Agreement with the State of Maine. The U.S. Nuclear Regulatory Commission is publishing for public comment the NRC staff assessment of a proposed agreement received from the Governor of the State of Maine for the assumption of certain of the Commission's regulatory authority pursuant to section 274 of the Atomic Energy Act of 1954, as amended. Comments are requested on the public health and safety aspects of the proposal.

Exemptions from the Commission's regulatory authority, which would implement this proposed agreement, have been published in the Federal Register and codified as part 150 of the Commission's regulations in Title 10 of the Code of Federal Regulations.

WORD COUNT: 10,756
TEXT:
SUPPLEMENTARY INFORMATION: Assessment of Proposed Maine Program to Regulate Certain Radioactive Materials pursuant to section 274 of the Atomic Energy Act of 1954, as amended (the Act).

The Commission has received a proposal from the Governor of Maine for the State to enter into an agreement with the NRC whereby the NRC would relinquish and the State would assume certain regulatory authority pursuant to section 274 of the Act.

Section 274e of the Act requires that the terms of the proposed agreement be published for public comment once each week for four consecutive weeks. Accordingly, this notice will be published four times in the Federal Register.
I. Background

A. Section 274 of the Act provides a mechanism whereby the NRC may transfer to the States certain regulatory authority over agreement materials fn 1 (pg 66655) when a State desires to assume this authority and the Governor certifies that the State has an adequate regulatory program, and when the Commission finds that the State's program is compatible with that of the NRC and is adequate to protect the public health and safety. Section 274g directs the Commission to cooperate with the States in the formulation of standards for protection against radiation hazards to assure that State and Commission programs for radiation protection will be coordinated and compatible. Further, section 274j provides that the Commission shall periodically review such agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this

section.

fn 1 A. Byproduct materials as defined in 11e.(1)
B. Byproduct materials as defined in 11e.(2)

C. Source materials; and

D. Special nuclear materials in quantities not sufficient to form a critical mass

B. In a letter dated March 5, 1990, Governor John P. McKernan, Jr. of the State of Maine requested that the Commission enter into an agreement with the State pursuant to section 274 of the Act. The Governor certified that the State of Maine has a program for control of radiation hazards which is adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State of Maine desires to assume regulatory responsibility for such materials. The text of the proposed agreement is shown in Appendix A to this document.

The specific authority requested is for (1) byproduct material as defined in section 11e.(1) of the Act, (2) source material, and (3) special nuclear material in quantities not sufficient to form a critical mass. The State does not wish to assume authority over (1) land disposal of source, byproduct and special nuclear material received from other persons; and (2) uranium recovery activities (byproduct material as defined in section 11e(2)). The State, however, reserves the right to apply at a future date to NRC for an amended agreement to assume authority in these areas. The nine articles of the proposed agreement-

Lists the materials covered by the agreement.

Lists the Commission's continued authority and responsibility for certain activities.

Allows for future amendment of the agreement.

Allows for certain regulatory changes by the Commission.

References the continued authority of the Commission for common defense and security for safeguard purposes.

Pledge the best efforts of the Commission and the State to achieve coordinated and compatible programs.

Recognizes reciprocity of licenses issued by the respective agencies.

Sets forth criteria for termination or suspension of the agreement.

Specifies the effective date of the agreement.

C. Maine Radiation Protection Act, sections 671 through 690, the enabling statute for the Maine Department of Human Services, authorizes the Department to issue licenses to, and perform inspections of, users of radioactive materials under the proposed agreement and otherwise carry out a total radiation control program. Maine regulations for radiation protection were adopted on January 1, 1986, with revisions dated January 1, 1988 and December 1, 1990, under authority of the enabling statute and provide standards, licensing, inspection, enforcement and administrative procedures for agreement and non-agreement materials. In addition, editorial revisions recommended by NRC are presently under consideration in Maine and are expected to be finalized in November 1991. Pursuant to Maine's regulations, section C.19, the regulations will apply to agreement materials on the effective date of the agreement. In addition to the material covered under the proposed agreement, the regulations provide for the State to license and inspect users of naturally-occurring and accelerator-produced radioactive materials.

D. The NRC staff assessment finds the proposed Maine program will provide adequately for public health and safety.

II. NRC Staff Assessment of the Proposed Maine Program for Control of Agreement Materials

Reference: Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement. fn 2

fn 2 NRC Statement of Policy published in the Federal Register January 23, 1981 (46 FR 7540-7546), a correction was published July 16, 1981 (46 FR 36969) and a revision of Criterion 9 published in the Federal Register July 21, 1983 (48 FR 33376).

Objectives

1. Protection. A State regulatory program shall be designed to protect the health and safety of the people against radiation hazards.

Based upon the analysis of the State's proposed regulatory program, the staff believes the Maine proposed

regulatory program for agreement materials is adequately designed to protect the health and safety of the public against radiation hazards.

Reference: Maine Program Statement, Application for Agreement State Status.

Radiation Protection Standards
2. Standards. The State regulatory program shall adopt a set of standards for protection against radiation which shall apply to byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass.

Statutory authority to formulate and promulgate rules for controlling exposure to sources of radiation is contained in the enabling statute. In accordance with that authority, the State adopted radiation control regulations on January 1, 1986, and with revisions dated January 1, 1988, and December 1, 1990, which include radiation protection standards which would apply to byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass upon the effective date of an agreement between the State and the Commission pursuant to Section 274b of the Atomic Energy Act of 1954, as amended. In addition, editorial revisions recommended by NRC are presently under consideration by the State and are expected to be finalized in November 1991.

Reference: State of Maine Rules Relating to Radiation Protection Parts A, B, C, D, E, G, J, K, L, Letter dated October 15, 1991.

3. Uniformity in Radiation Standards. It is important to strive for uniformity in technical definitions and terminology, particularly as related to such things as units of measurement and radiation dose. There shall be uniformity on maximum permissible doses and levels of radiation and concentrations of radioactivity, as fixed by 10 CFR part 20 of the NRC regulations based on officially approved radiation protection guides.

Technical definitions and terminology contained in the Maine Radiation Control Regulations including those related to units of measurement and radiation doses are uniform with those contained in 10 CFR part 20.
Reference: State of Maine Rules Relating to Radiation Protection Sections A.2, D.2, E.3, G.2, K.3, L.2.

4. Total Occupational Radiation Exposure. The regulatory authority shall consider the total occupational radiation exposure of individuals, including that from sources which are not regulated by it. The Maine regulations cover all sources of radiation within the State's jurisdiction and provide for consideration of the total radiation exposure of individuals from all sources of radiation in the possession of a licensee or registrant. {pg 66656}

Reference: State of Maine Rules Relating to Radiation Protection
Sections D.2 to D.7.

5. Surveys, Monitoring. Appropriate surveys and personnel monitoring under the close supervision of technically competent people are essential in achieving radiological protection and shall be made in determining compliance with safety regulations.

The Maine requirements for surveys to evaluate potential exposures from sources of radiation and the personnel monitoring requirements are uniform with those contained in 10 CFR part 20.

References: State of Maine Rules Relating to Radiation Protection Sections D.9, D.10 and D.15.

6. Labels, Signs, Symbols. It is desirable to achieve uniformity in labels, signs, and symbols, and the posting thereof. However, it is essential that there be uniformity in labels, signs, and symbols affixed to radioactive products which are transferred from person to person.

The prescribed radiation labels, signs and symbols are uniform with those contained in 10 CFR parts 20, 30 thru 32 and 34. The Maine posting requirements are also uniform with those of 10 CFR part 20.

References: State of Maine Rules Relating to Radiation Protection Sections C.6.E, C.6.F, C.11.D, D.11 and D.12.

7. Instruction. Persons working in or frequenting restricted areas shall be instructed with respect to the health risks associated with exposure to radioactive materials and in precautions to minimize exposure. Workers shall have the right to request regulatory authority inspections as per 10 CFR 19.16 and to be represented during inspections as specified in 10 CFR 19.14.
The Maine regulations contain requirements for instructions and notices to workers that are uniform with those of 10 CFR part 19.

Reference: State of Maine Rules Relating to Radiation Protection Section J.

8. Storage. Licensed radioactive material in storage shall be secured against unauthorized removal.

The Maine regulations contain a requirement for security of stored radioactive material.

Reference: State of Maine Rules Relating to Radiation Protection Section D.14.

9. *Radioactive Waste Disposal.*

(a) Waste disposal by material users. The standards for the disposal of radioactive materials into the air, water and sewer, and burial in the soil shall be in accordance with 10 CFR part 20. Holders of radioactive material desiring to release or dispose of quantities or concentrations of radioactive materials in excess of prescribed limits shall be required to obtain special permission from the appropriate regulatory authority.

Requirements for transfer of waste for the purpose of ultimate disposal at a land disposal facility (waste transfer and manifest system) shall be in accordance with 10 CFR part 20.

The waste disposal standards shall include a waste classification scheme and provisions for waste form, applicable to waste generators, that is equivalent to that contained in 10 CFR part 61.

(b) Land Disposal of waste received from other persons. The State shall promulgate regulations containing licensing requirements for land disposal of radioactive waste received from other persons which are compatible with the applicable technical definitions, performance objectives, technical requirements and applicable supporting sections set forth in 10 CFR part 61. Adequate financial arrangements (under terms established by regulation) shall be required for each waste disposal site licensee to ensure sufficient funds for decontamination, closure and stabilization of a disposal site. In addition, Agreement State financial arrangements for long-term monitoring and maintenance of a specific site must be reviewed and approved by the Commission prior to relieving the site operator of licensed responsibility (Section 151(a)(2), Pub. L. 97- 425).

The Maine regulations contain provisions relating to the disposal of radioactive materials into the air, water and sewer and burial in soil which are essentially uniform with those of 10 CFR part 20. Waste transfer and manifest system requirements for transfer of waste for ultimate disposal at a land disposal facility are included in the Maine regulations. The waste disposal requirements include a waste classification scheme and provisions for waste form equivalent to that in 10 CFR part 61.

Maine does not plan on seeking authority for the regulation of land disposal of source, byproduct and special nuclear material received from other persons.
References: State of Maine Rules Relating to Radiation Protection Sections D.7, and D.16 to D.26.

10. Regulations Governing Shipment of Radioactive Materials. The State shall to the extent of its jurisdiction promulgate regulations applicable to the shipment of radioactive materials, such regulations to be compatible with those established by the U.S. Department of Transportation and other agencies of the United States whose jurisdiction over interstate shipment of such materials necessarily continues. State regulations regarding transportation of radioactive materials must be compatible with 10 CFR part 71.

The Maine regulations are uniform with those contained in NRC regulations 10 CFR part 71.

References: State of Maine Rules Relating to Radiation Protection Section L.

11. Records and Reports. The State regulatory program shall require that holders and users of radioactive materials (a) maintain records covering personnel radiation exposures, radiation surveys, and disposals of materials; (b) keep records of the receipt and transfer of the materials (c) report significant incidents involving the materials, as prescribed by the regulatory authority; (d) make available upon request of a former employee a report of the employee's exposure to radiation; (e) at request of an employee advise the employee of his or her annual radiation exposure and (f) inform each employee in writing when the employee has received radiation exposure in excess of the prescribed limits.

The Maine regulations require the following records and reports of the licensees and registrants:

(a) Records covering personnel radiation exposures, radiation surveys, and disposals of materials.

(b) Records of receipt and transfer of materials.

(c) Reports concerning incidents involving radioactive materials.

(d) Reports to former employees of their radiation exposure.

(e) Reports to employees of their annual radiation exposure.

(f) Reports to employees of radiation exposure in excess of prescribed limits.

Reference: State of Maine Rules Relating to Radiation Protection Sections A.4, D.27, D.29, D.30, and J.4.

12. Additional Requirements and Exemptions. Consistent with the overall criteria here enumerated and to accommodate special cases and circumstances, the State regulatory authority shall be authorized in individual cases to impose additional requirements to protect health and safety, or to grant necessary exemptions which will not jeopardize health and safety.

The Maine Radiation Control Program is authorized to impose upon any licensee or registrant by rule, regulation, or order such requirements in addition (pg 66657) to those established in the regulations as it deems appropriate or necessary to minimize danger to public health and safety or property.

Reference: State of Maine Rules Relating to Radiation Protection Section A.7.

The Department may also grant such exemptions from the requirements of the regulations as it determines are authorized by law and will not result in undue hazard to public health and safety or property.

Reference: State of Maine Rules Relating to Radiation Protection Section A.3.

Prior Evaluation of Uses of Radioactive Materials

13. Prior Evaluation of Hazards and Uses, Exceptions. In the present state of knowledge, it is necessary in regulating the possession and use of byproduct, source and special nuclear materials that the State regulatory authority require the submission of information on, and evaluation of, the potential hazards and the capability of the user or possessor prior to his receipt of the materials. This criterion is subject to certain exceptions and to continuing reappraisal as knowledge and experience in the atomic energy field increase. Frequently there are, and increasingly in the future there may be, categories of materials and uses as to which there is sufficient knowledge to permit possession and use without prior evaluation of the hazards and the capability of the possessor and user. These categories fall into two groups-those materials and uses which may be completely exempt from regulatory controls, and those materials and uses in which sanctions for misuse are maintained without pre-evaluation of the individual possession or use. In authorizing research and development or other activities involving multiple uses of radioactive materials, where an institution has people with extensive training and experience, the State regulatory authority may wish to provide a means for authorizing broad use of materials without evaluating each specific use.

Prior to the issuance of a specific license for the use of radioactive materials, the Maine Radiation Control Program will require the submission of information on, and will make an evaluation of, the potential hazards of such uses, and the capability of the applicant.
References: State of Maine Rules Relating to Radiation Protection Sections C.7 and C.17 and the Maine Program Statement.

Provision is made for the issuance of general licenses for byproduct, source and special nuclear materials in situations where prior evaluation of the licensee's qualifications, facilities, equipment and procedures is not required. The regulations grant general licenses under the same circumstances as those under which general licenses are granted in the Commission's regulations.

References: State of Maine Rules Relating to Radiation Protection Sections C.5 and C.6.

The Maine regulations contain provisions for exempting of certain source and other radioactive materials and devices containing radioactive materials. These exemptions, for materials covered by the agreement, are the same as those granted by NRC regulations.

References: State of Maine Rules Relating to Radiation Protection Sections C.2 and C.3.

14. Evaluation Criteria . In evaluating a proposal to use radioactive materials, the regulatory authority shall determine the adequacy of the applicant's facilities and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. This guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

In evaluating a proposal to use agreement materials, the Maine Radiation Control Program will determine that:

(1) The applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with the regulations in such a manner as to minimize danger to public health and safety or property

(2) The applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property; and

(3) The issuance of the license will not be inimical to the health and safety of the public.

Other special requirements for the issuance of specific licenses are contained in the regulations.

References: State of Maine Rules Relating to Radiation Protection Sections C.8 to C.11 and the Maine Program Statement.

15. Human Use. The use of radioactive materials and radiation on or in humans shall not be permitted except by properly qualified persons (normally licensed physicians) possessing prescribed minimum experience in the use of radioisotopes or radiation.

The Maine regulations require that the use or radioactive materials (including sealed sources) on or in humans shall be by a physician having substantial experience in the handling and administration of radioactive material and, where applicable, the clinical management of radioactive patients.

Reference: State of Maine Rules Relating to Radiation Protection Sections G.66 to G.76.

Inspection

16. Purpose, Frequency. The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine and to assist in obtaining compliance with regulatory requirements. Frequency of inspection shall be related directly to the amount and kind of materials and type of operation licensed, and it shall be adequate to insure compliance.

Maine materials licensees will be subject to inspection by Radiation Control Program, Division of Health Engineering, the Department of Human Services. Upon instruction from the Department, licensees shall perform or permit the Department to perform any reasonable test and survey the Department considers appropriate or necessary. The frequency of inspections is dependent upon the type and scope of the licensed activities and will be at least as frequent as inspections of similar licensees by NRC. Generally, inspections will be unannounced.

References: State of Maine Rules Relating to Radiation Protection Sections A.5, A.6, A.7 and J.5.A; Maine Program Statement.

17. Inspection Compulsory. Licensees shall be under obligation by law to provide access to inspectors.

Maine regulations state that licensees shall afford the Department, at all reasonable times, opportunity to inspect sources of radiation and the premises and facilities wherein such sources of radiation are used or stored.

Reference: State of Maine Rules Relating to Radiation Protection Section A.5.

18. Notification of Results of Inspection. Licensees are entitled to be advised of the results of inspections and to notice as to whether or not they are in compliance.

Following Radiation Control Program inspections, each licensee will be notified in writing of the results of the (pg 66658) inspection. The letters and written notices indicate if the licensee is in compliance and if not, list the areas of noncompliance.

Reference: Maine Program Statement.

Enforcement

19. Enforcement. Possession and use of radioactive materials should be amenable to enforcement through legal sanctions, and the regulatory authority shall be equipped or assisted by law with the necessary powers for prompt enforcement. This may include, as appropriate, administrative remedies looking toward issuance of orders requiring affirmative action or suspension or revocation of the right to possess and use materials, and the impounding of materials; the obtaining of injunctive relief; and the imposing of civil or criminal penalties.

The Maine Radiation Control Program is equipped with the necessary powers for prompt enforcement of the regulations. Where conditions exist that create a clear presence of a hazard to the public health that requires immediate action to protect human health and safety, Maine may issue orders to reduce, discontinue or eliminate such conditions. The Radiation Control Program actions may also include impounding of radioactive material, imposition of a civil penalty, revocation of a license, and requesting the State Attorney General to seek injunctions and convictions for criminal violations.

References: State of Maine Rules Relating to Radiation Protection Sections A.7, A.8, A.9, Part B and C.22; Maine Radiation Protection Act Sections 688 and 690; Maine Program Statement.

Personnel

20. Qualifications of Regulatory and Inspection Personnel. The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspections of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments-their selection, use, and calibration-laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology, and engineering disciplines.

To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear material which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such person have a bachelor's degree or equivalent in the physical or life sciences, and specific training in radiation protection.

It is recognized that there will also be persons performing a more limited function in evaluation and inspection. These persons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's degree or equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.

The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with the regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the radiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirement for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will requires skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or as its command, not only for routine functions, but also for emergency cases.

(a) Number of Personnel.

There are approximately 110 NRC specific licenses in the State of Maine. Under the proposed agreement, the State would assume responsibility for about 105 of these licenses. The Division of Health Engineering is currently staffed with 8 professional persons.

Donald Hoxie-Director, Division of Health Engineering. Responsible for the overall supervision of four State-wide regulatory programs, including the Radiological Health Program.

Wallace Hinckley-Assistant Director of Health Engineering. Responsible as Assistant Director for the overall supervision of four Statewide regulatory programs, including the Radiation Control Program. Wellington Clough Toppan, Jr.-Manager, Radiation Control Program. Responsible for overall supervision of the Radiation Control Program, which regulates x-ray equipment and radionuclide users and conducts environmental monitoring of nuclear power facilities.

Rober Schell-Nuclear Engineering Specialist, Radiation Control Program. Responsible for environmental surveillance of and emergency planning for Maine Yankee Atomic Power Company.

David Breau-Sanitary Engineer II, Drinking Water Program. Responsible for review and approval of engineering plans for water treatment facilities. Backup staff available to the Radiation Control Program.

Linda A. Plausquellic-Radiation Specialist, Radiation Control Program. Performs compliance inspections and registration for x-ray machines. Assists in radioactive materials licensing program.

Jay Carl Hyland-Health Physicist, Radiological Health Program. Responsible for radioactive materials licensing and inspection program.

Cheryl Baker-Chemist II. Responsible for implementation of all radiological testing.

(b) Training.

Reference: Maine Program Statement.

21. Conditions Applicable to Special Nuclear Material, Source Material and Tritium. Nothing in the State's regulatory program shall interfere with the duties imposed on the holder of the materials by the NRC, for example, the duty to report to the NRC, on NRC prescribed forms (1) transfers of special nuclear material, source material and tritium and (2) periodic inventory data.

The State's regulations do not prohibit or interfere with the duties imposed by the NRC on holders of special nuclear material owned by the U.S. Department of Energy or licensed by NRC, such as the responsibility of licensees to supply to the NRC reports of transfer and inventory.

Reference: State of Maine Rules Relating to Radiation Protection Section A.1.

22. Special Nuclear Material Defined. Special nuclear material, in quantities not sufficient to form a critical mass, for present purposes means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium 233 in quantities not exceeding 200 grams: Plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination should not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

175 (grams contained U-235)/350

50 (grams U- 233)/200

50 (grams Pu) 1/200

(This definition is subject to change by future Commission rule or regulation.)

The definition of special nuclear material in quantities not sufficient to form a critical mass, as contained in the Maine regulations, is uniform with the definition in 10 CFR Part 150.

Reference: State of Maine Rules Relating to Radiation Protection Section A.2.A(62), Definition of Special Nuclear Material in Quantities Not Sufficient to Form a Critical Mass.

Administration

23. Fair and Impartial Administration. State practices for assuring the fair and impartial administration of regulatory law, including provision for public participation where appropriate, should be incorporated in procedures for:

(a) Formulation of rules of general applicability

(b) Approving or denying applications for licenses or authorization to possess and use radioactive materials, and

(c) Taking disciplinary actions against licensees.

The Maine statute and regulations provide for administrative and judicial review of actions taken by the Division of Health Engineering which includes the Maine Radiation Control Program. Reference: Maine Administrative Procedure Act, State of Maine Rules Relating to Radiation Protection Sections A.9, A.11, C.22, and J.

24. State Agency Designation. The State should indicate which agency or agencies will have authority for carrying on the program and should provide the NRC with a summary of that legal authority. There should be assurances against duplicate regulation and licensing by State and local authorities, and it may be desirable that there be a single or central regulatory authority.

The Maine Department of Human Services in which the Maine Radiation Control Program is located has been designated as the State's radiation control agency.

References: Maine Radiation Protection Act, Section 674.1 and 686.

25. Existing NRC Licenses and Pending Applications. In effecting the discontinuance of jurisdiction, appropriate arrangements will be made by NRC and the State to ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer. For example, one approach might be that the State, in assuming jurisdiction, could recognize and continue in effect, for an appropriate period of time under State law, existing NRC licenses, including licenses for which timely applications for renewal have been filed, except where good cause warrants the earlier reexamination or termination of the license.

Maine regulations have provisions for NRC licensees to possess a like license issued under the Maine regulations and the Maine Act. These licenses will expire either 90 days after receipt from the Agency of a notice of expiration of such license or on the date of expiration specified in the NRC license, whichever is earlier.

Reference: State of Maine Rules Relating to Radiation Protection Section C.19. {pg 66661}

26. Relations With Federal Government and Other States. There should be an interchange of Federal and State information and assistance in connection with the issuance of regulations and licenses or authorizations, inspection of licensees, reporting of incidents and violations, and training and education problems.

The proposed agreement declares that the State will use its best efforts to cooperate with the NRC and the other Agreement States in the formulation of standards and regulatory programs for the protection against the hazards of radiation and to assure that the State's program will continue to be compatible with the Commission's program for the regulation of like materials.

Reference: Proposed Agreement between the State of Maine and the Nuclear Regulatory Commission, Article VI.

27. Coverage, Amendments, Reciprocity. The proposed Maine agreement provides for the assumption of regulatory authority over the following categories of materials within the State:

(a) Byproduct material, as defined by Section 11e.(1) of the Atomic Energy Act, as amended.

(b) *Source* materials.

(c) Special nuclear materials in quantities not sufficient to form a critical mass.

Reference: Proposed Agreement, Article I.

Provision has been made by Maine for the reciprocal recognition of licenses to permit activities within Maine of persons licensed by other jurisdictions. This reciprocity is like that granted under 10 CFR part 150.

Reference: State of Maine Rules Relating to Radiation Protection Section 3.X.

28. NRC and Department of Energy Contractors. The State's regulations provide that certain NRC and DOE contractors or subcontractors are exempt from the State's requirements for licensing and registration of sources of radiation which such persons receive, possess, use, transfer, or acquire.

Reference: State of Maine Rules Relating to Radiation Protection Section A.3.B.

III. Staff Conclusion

Section 274d of the Atomic Energy Act of 1954, as amended, states:

The Commission shall enter into an agreement under subsection b of this section with any State if:

(1) The Governor of the State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

(2) The Commission finds that the State program is in accordance with the requirements of subsection o. and in all other respects compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed amendment. The staff has concluded that the State of Maine meets the requirements of section 274 of the Act. The State's statutes, regulations, personnel, licensing, inspection and administrative procedures are compatible with those of the Commission and adequate to protect the public health and safety with respect to the materials covered by the proposed agreement. Since the State is not seeking authority over uranium milling activities, subsection o. is not applicable to the proposed Maine agreement.

Dated at Rockville, Maryland, this 22nd day of November 1991.

For the U.S. Nuclear Regulatory Commission.

Carlton Kammerer,
Director, Office of State Programs.

Appendix A-Agreement Between the United States Nuclear Regulatory Commission and the State of Maine for Discontinuance of Certain Commission Regulatory Authority and Responsibility Within the State Pursuant to Section 274 of the Atomic Energy Act of 1954, as Amended

Whereas, The United States Nuclear Regulatory Commission (hereinafter referred to as the Commission) is authorized under section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act), to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8, and section 161 of the Act with respect to byproduct materials as defined in sections 11e.(1) and (2) of the Act, source materials, and special nuclear materials in quantities not sufficient to form a critical mass; and,

Whereas, The Governor of the State of Maine is authorized under Maine Revised Statutes Annotated section 284 to enter into this Agreement with the Commission; and,

Whereas, The Governor of the State of Maine certified on March 5, 1990, that the State of Maine (hereinafter referred to as the State) has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by this Agreement, and that the State desires to assume regulatory responsibility for such materials; and,

Whereas, The State and the Commission recognize the desirability and importance of cooperation between the Commission and the State in the formulation of standards for protection against hazards of radiation and in assuring that State and Commission programs for protection against hazards of radiation will be coordinated and compatible; and,

Whereas, The Commission and the State recognize the desirability of reciprocal recognition of licenses and exemptions from licensing of those materials subject to this Agreement; and Whereas, This Agreement is entered into pursuant to the provisions of the Act, as amended

Now Therefore, it is hereby agreed between the Commission and the Governor of the State, acting in behalf of the State, as follows:

Article I

Subject to the exceptions provided in Articles II, IV, and V, the Commission shall discontinue, as of the effective date of this Agreement, the regulatory authority of the Commission in the State under chapters 6, 7, and 8, and section 161 of the Act with respect to the following materials:

A. Byproduct materials as defined in section 11e.(1) of the Act

B. Source materials; and

C. Special nuclear materials in quantities not sufficient to form a critical mass.

Article II

This Agreement does not provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of:

A. The construction and operation of any production or utilization facility

B. The export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility

C. The disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission

D. The disposal of such other byproduct, source, or special nuclear material as the Commission from time to time determines by regulation or order should, because of the hazards or (pg 66662) potential hazards thereof, not be so disposed of without a license from the Commission

E. The land disposal of source, byproduct and special nuclear material received from other persons; and,

F. The extraction or concentration of source material from source material ore and the management and disposal of the resulting byproduct material.

Article III

This Agreement may be amended, upon application by the State and approval by the Commission, to include the additional area(s) specified in Article II, paragraph E or F, whereby the State can exert regulatory control over the materials stated herein.

Article IV

Notwithstanding this Agreement, the Commission may from time to time by rule, regulation, or order, require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license or an exemption from licensing issued by the Commission.

Article V

This Agreement shall not affect the authority of the Commission under subsection 161 b. or i. of the Act to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material.

Article VI

The Commission will use its best efforts to cooperate with the State and other Agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible. The State will use its best efforts to cooperate with the Commission and other Agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that the State's program will continue to be compatible with the program of the Commission for the regulation of like materials. The State and the Commission will use their best efforts to keep each other informed of proposed changes in their respective rules and regulations and licensing, inspection and enforcement policies and criteria, and to obtain the comments and assistance of the other party thereon.

Article VII

The Commission and the State agree that it is desirable to provide reciprocal recognition of licenses for the materials listed in Article I licensed by the other party or by any Agreement State. Accordingly, the Commission and the State agree to use their best efforts to develop appropriate rules, regulations, and procedures by which such reciprocity will be accorded.

Article VIII
The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State, or upon request of the Governor of the State, may terminate or suspend all or part of this Agreement and reassert the licensing and regulatory authority vested in it under the Act if the Commission finds that (1) such termination or suspension is required to protect the public health and safety, or (2) the State has not complied with one or more of the requirements of section 274 of the Act. The Commission may also, pursuant to section 274j of the Act, temporarily suspend all or part of this Agreement if, in the judgement of the Commission, an emergency situation exists requiring immediate action to protect public health and safety and the State has failed to take necessary steps. The Commission shall periodically review this Agreement and actions taken by the State under this Agreement to ensure compliance with section 274 of the Act.
Article IX

This Agreement shall become effective on XXX, and shall remain in effect unless and until such time as it is terminated pursuant to Article VIII.

Done at Augusta, Maine, in triplicate, this XXX, 1991.

For the U.S. Nuclear Regulatory Commission.

Ivan Selin,

Chairman.

For the State of Maine.

John R. McKernan, Jr.,
Governor.
INTERNAL DATA: FR Doc. 91-30696; Filed 12-23-91; 8:45 am; BILLING CODE
7590-01-M

Citation 333

<DIALOG File 6: (c) 1993 NTIS>
1182914 NTIS Accession Number: DE86900357/XAB
Title: Health Physics Considerations in Decontamination and Decommissioning
Author: Health Physics Society, Knoxville, TN. East Tennessee Chapter.
Corp. Source Codes: 085558001; 9520145
Report No.: CONF-860203-
Date: Dec 85 553p
Languages: English Document Type: Conference proceeding
Journal Announcement: GRAI8611; NSA1100
Note: Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted. NTIS Prices: PC$23.00/MF A01
Country of Publication: United States
Abstract: These proceedings contain papers on legal considerations, environmental aspects, decommissioning equipment and methods, instrumentation, applied health physics, waste classification and disposal, and project experience. Separate abstracts have been prepared for individual papers. (ERA citation 11:012837)
Descriptors: *decommissioning; *decontamination; leading abstract; legal aspects; meetings; nuclear facilities; radiation monitoring; radiation protection
Identifiers: ERDA/054000; ERDA/220900; ERDA/290600; NTISDEE
Section Headings: 18G (Nuclear Science and Technology--Radioactive Wastes and Fission Products); 6R (Biological and Medical Sciences--Radiobiology) 77G (Nuclear Science and Technology--Radioactive Wastes and Radioactivity) 57V (Medicine and Biology--Radiobiology)

Citation 334

<DIALOG File 669: (c) U.S. Govt Printing Office>

00475477
Titel: Science Advisory Board, Radiation Advisory Committee; Public Meeting and Conference Calls, Vol. 58, No. 103, 58 FR 31201
Date: Tuesday, June 01, 1993
AGENCY: ENVIRONMENTAL PROTECTION AGENCY (EPA)
DOC TYPE: Notices
NUMBER: FRL-4661-3
CONTACT: FOR FURTHER INFORMATION CONTACT: Copies of the documents given to the Science Advisory Board for review are provided by the Agency to the public; they are not available from the Science Advisory Board staff. The contact persons for these documents are noted above. For technical or procedural information concerning these meetings or the RAC self-generated initiatives, please contact Dr. K. Jack Kooyoomjian, the Designated Federal Official for the RAC. For additional administrative information concerning these meetings, including draft agendas, please contact Mrs. Diana Pozun, Staff Secretary for the RAC, Science Advisory Board (A101F), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, Phone: (202) 260-6552; Fax: (202) 260-7118.

Written comments of any length (at least thirty-five copies) may be provided to the RAC up until the meetings. However, anyone who wishes to have the RAC receive their comments prior to the meeting should provide written public comments for any of the above announced meetings to Mrs. Pozun at the SAB staff office no later than ten days before the meeting copies received after that date will be provided to the RAC at the meeting. On the conference call, opportunities for oral comment will generally be limited to no more than five minutes per speaker and no more than fifteen minutes per conference call. A fixed number of conference lines have been reserved for the meeting. For the conventional meetings, opportunities for oral comment will generally be limited to no more than ten minutes per speaker and no more than thirty minutes per day. The SAB expects that public statements presented at its meetings will not be repetitive of previously submitted oral or written statements. Commenters should register with Mrs. Pozun at least ten days before the meeting, being sure to specify at which meeting they wish to provide comments, if they wish to be formally listed on the agenda.

The conference calls and meeting are open to the public, however seating at the July meeting, as well as telephone lines for the June conference calls, is limited and is available on a first come basis.

Dated: May 18, 1993.

A. Robert Flaak,

Acting Staff Director, Science Advisory Board.
SUMMARY: Pursuant to the Federal Advisory Committee Act, Public Law 92-463, notice is hereby given that the Science Advisory Board's (SAB's) Radiation Advisory Committee (RAC), will conduct the following public conference calls and meeting.

1. The RAC will meet by conference call Monday June 14, 1993 from 11 a.m. to 1 p.m. Eastern Time to discuss to discuss preparation for a review of a revised draft document which was prepared by the Office of Radiation and Indoor Air (ORIA), entitled "Diffuse NORM (naturally-occurring radioactive material)-Waste Characterization and Preliminary Risk Assessment," dated April 1993, as well as other topics planned for the Committee's July meeting. The RAC may also briefly discuss and follow-up on other topics that were discussed at its April 27 and 28, 1993 meeting. The number of conference lines available is limited, therefore, persons wishing to participate should telephone Mrs. Diana Pozun, SAB Secretary for the SAB's RAC, no later than 2 p.m. Eastern Time Monday June 7 at (202) 260-6552.

2. The RAC will meet by conference call Monday June 21, 1993 from 11 a.m. to 1 p.m. Eastern Time to continue its discussion from the June 14 conference {pg 31202} call. The number of conference lines available is limited, therefore, persons wishing to participate should telephone Mrs. Diana Pozun, SAB for the SAB's RAC, no later than 2 p.m. Eastern Time Monday June 14 at (202) 260-6552.

3. The RAC will meet July 19-21 from 9 Monday July 19 until 5 Wednesday on July 21 at the Quality Inn Capitol Hill Hotel, 415 New Jersey Ave., NW., Washington, DC (Tel. 202-638 1616). There are a number of topics before the Committee. A major review topic deals with review of ORIA's draft entitled "Diffuse NORM Wastes: Waste Characterization and Preliminary Risk Assessment."

The charge for this review identifies the following questions for the review.

1. Does the information in the document present an adequate characterization of processes and sources of NORM, including the adequacy of the data?

2. Are parameters used in the risk assessment reasonable? Are the references and justifications adequate? Does the presentation properly reflect the best available scientific information?

3. Does the preliminary risk assessment adequately identify and characterize the key scenarios needed for evaluating individual and population risks from the sources characterized?

4. Does the PATHRAE methodology presented in this document adequately quantify risks from the sources and scenarios characterized?

5. Risk estimates calculated using the PATHRAE methodology are estimated to be within a factor of three of calculations made with more detailed codes. Given this error band, the methodology employed, and the lack of knowledge associated with the waste streams; is the Agency's characterization of uncertainty and sensitivity adequate for the purpose of this scoping study?

6. In what areas does the SAB's RAC recommend the greatest priority be given for developing additional information?

The draft document entitled "Diffuse NORM (naturally- occurring radionuclide material)-Waste Characterization and Preliminary Risk Assessment," dated April 1993, is available from the EPA's Air Docket at 401 M Street, SW., Washington, DC 20460 (202-260-7548). The Docket Number is R-82-01, and the Item Number is IIA-38. For technical information on the NORM report, please contact Mr. William E. Russo of ORIA at (202-233-9215). The RAC may also consider three draft Committee self-generated initiatives, namely: The report of the Radon Science Initiative Subcommittee, a retrospective consideration of previous Radiation Advisory Committee reports, and a commentary on waste classification. The RAC plans to initiate a review of a Radon Protocol Evaluation Study, which evaluates the suitability of using short-term measurements for mitigation decision-making on indoor radon. For further technical information on this topic, call Mr. Frank Marcinowski of ORIA at (202-233-9437). ORIA will provide an information briefing on its program to develop standards for cleanup of sites contaminated by radioactivity, including option selection, and may request review of technical documents and other information related to this program. For technical information on this topic, please contact Ms. Barbara Hostage of ORIA at (202-233-9350). The RAC may be briefed on other ORIA initiatives, and may also consider other topics relating to radiation and the environment as time permits. INTERNAL DATA: FR Doc. 93-12836; Filed 5-28-93; 8:45 am;
BILLING CODE
6560-50-P

Citation 335

<DIALOG File 669: (c) U.S. Govt Printing Office>

00465951
Title: Science Advisory Board; Public Meetings, Vol. 58, No. 067, 58 FR 18393
Date: Friday, April 09, 1993
AGENCY: ENVIRONMENTAL PROTECTION AGENCY (EPA)
DOC TYPE: Notices
NUMBER: FRL-4612-3
WORD COUNT: 892
TEXT:
Under Public Law 92-463, notice is hereby given of the following two Science Advisory Board (SAB) meetings. These meetings are open to the public; however, seating is limited and is on a first-come basis.

1. The Radiation Advisory Committee (RAC) will meet April 27-28, 1993, Guest Quarters Suite Hotel, 100 South Reynolds Street, Alexandria, Virginia 22304, 703-370-9600. The meeting will begin at 9 a.m. on Tuesday April 27 and adjourn no later than 5 p.m. on Wednesday April 28. The draft agenda calls generally for discussion of waste issues on Tuesday and electric magnetic fields on Wednesday, as described below.

(A) Tuesday's meeting will begin with consideration of naturally-occurring radioactive materials (NORM), including a briefing by the Office of Radiation and Indoor Air (ORIA) on their draft preliminary risk assessment, with the intention of conducting a review of the topic at the July 1993 RAC meeting. {pg 18394}

(B) Tuesday's meeting will continue with discussion and presentations concerning source terms and waste classification systems, a briefing on the activities of the Radon Science Initiative Subcommittee, and progress briefings on radon research related activities of the Office of Radiation and Indoor Air.

(C) On Wednesday, the Agency will brief the RAC on progress towards implementing the recommendations found in its two earlier reports on electric and magnetic fields; i.e., EPA-SAB-RAC-92-013 (potential carcinogenicity) and EPA-SAB-RAC-LTR-92-009 (research needs); see (D) below for ordering information. RAC member Dr. Ricardo Gonzalez and ORIA staff will brief the Committee on the EPA's Radiofrequency Radiation Conference. Staff from the Office of Health Research will brief the Committee on Electric and Magnetic Fields: An EPA Perspective on Research Needs and Priorities for Improving Health Risk Assessment (EPA/600/9-91/016F), December 1992. Copies of this document are available from CERI (513) 569-7562. ORIA staff will update the RAC on the Office's citizen communication activities. The RAC will also begin planning for future
reviews.

(D) RAC member Dr. Oddvar Nygaard will lead a overview discussion on RAC reviews and Agency responses since the Committee's formation in 1985 and their implication for risk reduction. A list of RAC reports, with ordering

numbers, can be obtained from Mrs. Dorothy Clark (202) 260-6552 the reports themselves are available by calling (202) 260-4126.

(E) The Committee may also discuss other issues relating to environmental radiation.

2. The RAC's Radon Science Initiative Subcommittee will meet on May 20-21, 1993, Guest Quarters Suite Hotel, 100 South Reynolds Street, Alexandria, Virginia 22304, 703-370-9600. The meeting will begin at 9 a.m. on Thursday and adjourn no later than 4 p.m. on Friday. The Subcommittee will discuss written materials they have prepared as a result of their earlier meetings on radon research, including radon risk and exposure assessment, radon reduction, and radon communication. Copies of this material will be available to the public in May through Mrs. Diana Pozun (202/260-6552).

The proposed charge for the Subcommittee is: (a) What are the remaining important areas of scientific uncertainty that affect (1) the estimates of exposure and risk associated with radon, and (2) risk reduction strategies (such as mitigation)?; (b) broadly, what scientific efforts are currently underway, both within the Agency and outside, that would address these areas?; and (c) what are the priorities for near- and longer-term research needs for the Agency's own programs.

Anyone wishing to provide written public comments for the April 27-28 meeting or the May 20-21 meeting should forward at least thirty-five copies to Mrs. Dorothy Clark or Mrs. Diana Pozun respectively. Both can be reached at (A-101F), Science Advisory Board, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. Copies of these statements received in the SAB Staff Office ten days prior to a meeting will be mailed to the Committee before that meeting; copies received after that date will be provided to the Committee at the meeting. Commenters should register with Mrs. Clark or Mrs. Pozun at least ten days before the meeting, being sure to specify at which meeting they wish to provide comments, the nature of the comments, and audiovisual requirements.

Dated: April 1, 1993.
A.R. Flaak,

Acting Staff Director, Science Advisory Board.
INTERNAL DATA: FR Doc. 93-8396 Filed 4-8-93; 8:45 am; BILLING CODE
6560-50-P

Citation 336

<DIALOG File 669: (c) U.S. Govt Printing Office>

00461996
Title: States of Washington and Oregon: Denial of Petition for Rulemaking, Vol. 58, No. 041, 58 FR 12342
Date: Thursday, March 04, 1993
AGENCY: NUCLEAR REGULATORY COMMISSION (NRC)
DOC TYPE: Proposed Rules
CFR: 10 CFR Part 60
NUMBER: Docket No. PRM-60-4
CONTACT: FOR FURTHER INFORMATION CONTACT: Naiem S. Tanious, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3878. ADDRESSES: Copies of the petition for rulemaking, the public comments received, and the NRC's letter to the petitioner are available for public inspection or copying in the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC.
ACTION: Denial of petition for rulemaking.

SUMMARY: The Nuclear Regulatory Commission (NRC) is denying a petition for rulemaking (PRM-60-4), submitted by the States of Washington and Oregon, which deals with the process and criteria for classifying radioactive waste materials at defense facilities as high-level radioactive waste (HLW) or as non-HLW. (As noted in the petition, certain facilities for the storage of HLW are subject to NRC licensing authority.) The petition is being denied because the NRC concludes that the principles for waste classification are well established and can be applied on a case-by-case basis without revision to the regulations.

WORD COUNT: 7,833
TEXT:
SUPPLEMENTARY INFORMATION:
I. The Petition

The States of Washington and Oregon, and the Yakima Indian Nation, initially submitted a petition for rulemaking on this subject on January 2, 1990. On February 7, 1990, the NRC staff conferred with the petitioners as contemplated by paragraph (b) of 10 CFR 2.802. In response to suggestions by the NRC staff, the petition was clarified and resubmitted (by the States of Washington and Oregon) on July 27, 1990.

On December 17, 1990, the Nuclear Regulatory Commission published a notice of receipt of the petition for rulemaking (55 FR 51732). The petition requested that the Commission revise the definition of "high-level radioactive waste" (HLW) so as to establish a procedural framework and substantive standards by which the

Commission will determine whether reprocessing waste, including in particular certain waste stored at the U.S. Department of Energy's (DOE) site at Hanford, Washington, is HLW and, therefore, subject to the Commission's licensing authority.

The petitioners request that the Commission amend 10 CFR 60.2 to clarify the definition of HLW and the definition of "HLW facility." The petitioners specifically request that the Commission:

1. Establish a process to evaluate the treatment of defense reprocessing wastes in tanks so that such wastes will not be considered HLW if, prior to disposal, each tank is treated to remove the largest technically achievable amount of radioactivity; and

2. Require that the heat produced by residual radionuclides, together with the heat of reaction during grout processing (if employed as a treatment technology), will be within limits established to ensure that grout meets temperature requirements for long-term stability for low-level waste forms.

The petitioners state that the petition for rulemaking is based, in part, on Section 202 of the Energy Reorganization Act of 1974 (ERA), which provides for the Commission to exercise licensing and related regulatory authority over "facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive wastes generated by DOE which are not used for, or are part of, research and development activities."

According to the petitioners, the legislative history of the ERA reveals that Congress intended the Commission to license defense reprocessing tank wastes at the point of long-term storage or disposal. The petitioners note that "low-fraction wastes" resulting from pretreatment of tank wastes are scheduled to be grouted and disposed of in land-based grout vaults on the Hanford site in accordance with regulations developed under the Resource Conservation and Recovery Act (RCRA). The petitioners believe that if these wastes are HLW, they clearly fall under the Commission's licensing jurisdiction under Section 202(4) of the Energy Reorganization Act of 1974 (42 U.S.C. 5842(4)).

The petitioners acknowledge that the present definition of HLW in the Commission's regulations is based upon the source of the waste, and that "incidental waste" generated in the course of reprocessing is not HLW. (The latter point is evident from the proposal to amend 10 CFR 60.2 to provide that a residual fraction would be "considered an incidental waste and, therefore, not HLW.") The petitioners claim, however, that wastes stored in tanks at Hanford cannot practicably be classified as incidental waste (as opposed to HLW) because the tanks contain a mixture of wastes from a number of sources, including reprocessing of reactor fuel. Moreover, the petitioners state that radionuclide inventories are estimates subject to substantial uncertainty, owing to lack of accurate records. Further, the petitioners assert that neither DOE, the Commission, nor the petitioners have adequate information regarding the source and composition of the tank waste. Hence, the petitioners believe that the Commission needs to establish both a procedure and a standard for making an evaluation as to whether wastes are HLW on a tank-by- tank basis.

The petitioners assert that the proposed amendment is essential to provide protection of the future health and safety of the citizens of the Pacific Northwest.

II. Classification of DOE Reprocessing Wastes

At Hanford and other sites, questions have arisen regarding the classification of reprocessing wastes for which DOE must provide disposal. In the long-standing view of the Commission, these questions must be resolved by examining the source of the wastes in question. The reason for this is that when Congress assigned to NRC the licensing authority over certain DOE facilities for "high-level radioactive wastes," the Congress was referring to those materials encompassed within the meaning of the term "high- level radioactive waste" in Appendix F of 10 CFR Part 50. (For a full statement of this position, see the discussion presented in the Commission's advance notice of proposed rulemaking, "Definition of High-Level Radioactive Waste" (52 FR 5993, February 27, 1987).) Accordingly, any facility to be used for the disposal of "those aqueous wastes resulting from the operation of the first cycle solvent extraction system, or equivalent . . ." as HLW is defined in Appendix F to Part 50, must be licensed by the NRC. Most of the waste storage tanks at Savannah River (South Carolina), West Valley (New York), and Hanford contain wastes that meet this definition, and the facilities to be used for disposal of these wastes are, therefore, potentially subject to NRC licensing jurisdiction. 12343

However, when the Appendix F definition was promulgated, the Atomic Energy Commission specifically noted that the term HLW did not include "incidental" waste resulting from reprocessing plant operations, such as ion exchange beds, sludges, and contaminated laboratory items, such as clothing, tools, and equipment. Neither were radioactive hulls and other irradiated and contaminated fuel structural hardware encompassed by the Appendix F definition. Under the same reasoning, as the Commission has previously indicated, incidental wastes generated in further treatment of HLW (e.g., salt residues or miscellaneous trash from waste glass processing) would be outside the Appendix F definition.

In the cases of Savannah River and West Valley wastes, DOE plans to retrieve the wastes from their storage tanks and to separate essentially all of the radioactive materials for eventual disposal in a deep-geologic HLW repository. fn 1 Accordingly, the projected recovery of HLW from the wastes in tank storage at those sites will be sufficiently complete that the decontaminated salts and other residual wastes are classified as "incidental" (i.e., non-HLW). The NRC will have no regulatory authority, under Section 202 of the Energy Reorganization Act,

over DOE's facilities to be used for processing and disposal of the incidental waste.

fn 1 See 52 FR 5992, February 27, 1987 (definition of "high-level waste"), n. 1, where the Commission characterizes as "incidental waste," the decontaminated salt with residual activities on the order of 1,500 nCi/g Cs-137, 30 nCi/g Sr- 90, 2 nCi/g Pu, as described in the Department of Energy's FEIS on long-term management of defense HLW at the Savannah River Plant, DOE/EIS-0023, 1979. Although an EIS has not yet been published for the West Valley Demonstration Project, preliminary estimates indicate the likelihood of an equivalent degree of separation.

At Hanford, DOE plans to process the wastes presently stored in double- shell tanks in a manner similar to that planned for the wastes at Savannah River and West Valley. Such processing would separate most of the radioactive constituents of the wastes for eventual deep- geologic repository disposal and, the residual salts would be disposed of onsite in a shallow, near-surface concrete-like grout facility. (Plans for processing of single-shell tank wastes have been deferred.) However, classification of the Hanford double-shell tank wastes has proven more difficult than classification of Savannah River and West Valley wastes. At Hanford, many of the primary reprocessing wastes were generated using older separation technologies, which resulted in substantial dilution of those wastes with nonradioactive materials. In addition, many of the tanks at Hanford contain mixtures of wastes from both reprocessing sources and other sources. Finally, recordkeeping at Hanford was not always thorough enough to allow precise determinations of the origins of the wastes now present in specific tanks at Hanford. For these reasons, some of the Hanford tank wastes cannot be readily classified as either HLW or incidental wastes using only the definitions and concepts discussed above.

Taking into account these uncertainties and their implications with respect to NRC jurisdiction, the NRC and DOE staff held several meetings to explore the situation in detail. A principal objective of these meetings was to ascertain, to the extent practicable, whether some or all of the wastes should be regarded as HLW and whether, on the other hand, some or all of the wastes should be classified as non-HLW. Several things became clear as a result of these meetings.

First, management records were adequate for DOE to determine that two double-shell waste tanks do not contain wastes from reprocessing of reactor fuels. Therefore, these wastes clearly do not contain HLW within the Appendix F definition. The NRC agreed with DOE that any disposal facility intended exclusively for these wastes would not be subject to NRC licensing authority.

Second, DOE has carried out a "material balance" analysis of waste management activities at Hanford. This analysis estimated the total amount of "first cycle reprocessing wastes" generated at Hanford and, to the extent practical, the current location of those wastes. The DOE proposed onsite grout disposal of the residual waste from the double-shell tank waste processing would be only a small fraction of the reprocessing wastes originally generated at the site.

Finally, DOE studied possible technologies for additional waste processing, and agreed to remove the largest practical amount of radioactive material from double-shell tank wastes prior to disposal in onsite grout facilities. This commitment by DOE, coupled with the material- balance study indicating that most of the originally-generated radioactive material would be recovered, led the NRC staff to conclude that the residual waste material should be classified as incidental waste, since they are wastes incidental to the process of recovering HLW. With this classification, DOE could proceed with onsite disposal of such incidental wastes in a grout facility without licensing by the NRC. It should be noted that if the DOE processing operations go as planned, the residual activity of these incidental wastes would be below the concentration limits for Class C wastes under the waste classification criteria of 10 CFR part 61.

Following its review, the NRC staff, by letter dated September 25, 1989, from R.M. Bernero, Director, Office of Nuclear Material Safety and Safeguards, NRC, to A.J. Rizzo, Assistant Manager for Operations, Richland Operations Office, DOE, endorsed DOE's plans to sample and analyze the grout feeds before disposal in an effort to control the final composition of the grout feed. However, the staff indicated that if DOE were to find, in the course of conducting the sampling program, that the inventories of key radionuclides entering the grout facility are significantly higher than previously estimated, DOE should notify the NRC and other affected parties in a timely manner.

It should be noted that the appropriate classification of some Hanford wastes remains to be determined -- specifically, any single-shell tank wastes, and any empty but still contaminated waste tanks DOE might dispose of in-place. For both types of wastes, a case-by-case determination of the appropriate waste classification might be necessary.

III. Discussion

The petition for rulemaking presents two basic issues. The question is not whether "high-level waste" should be interpreted by reference to the source-based concepts derived from appendix F to 10 CFR part 50. The petitioners agree that this is proper. Nor is there any fundamental challenge to the concept that "incidental wastes" are excluded from the definition of "high-level waste." The issues are much narrower ones. The first issue is a substantive one -- the criteria to be applied in differentiating incidental waste from high-level waste. The second issue is a procedural one -- the process that should be employed by the Commission in arriving at a judgment whether or not it has jurisdiction over particular facilities. These will be addressed in turn.

A. The Standard for Classification

We first address the standard that should be employed in distinguishing high-level waste from incidental waste. In doing so, we strive to apply the policies that underlie the adoption of appendix F to 10 CFR part 50 (and, hence, section 202 of the Energy Reorganization Act). 12344

The petitioners suggest that the proper standard, to be applied on a tank-by-tank basis, is to consider all processing streams to be high-level waste unless they have been treated, prior to disposal, "to remove the largest technically achievable amount of radioactivity." Adoption of such a criterion would certainly serve the goal, which had been contemplated by the Commission, of removing the hazardous process streams to a geologic repository for permanent storage. It is not the only standard, however, that would suffice for this purpose, particularly when it is viewed in a broader regulatory context. The clearest expression of the overall regulatory objectives is the Atomic Energy Commission's (AEC's) explanatory statement when it promulgated appendix F -- namely, "that the public interest requires that a high degree of decontamination capability be included in such facilities and that any residual radioactive contamination after decommissioning be sufficiently low as not to represent a hazard to the public health and safety." 35 FR 17530, November 14, 1970. As we read the AEC's intent, the reference to "a high degree of decontamination capability" leaves a substantial degree of discretion. It certainly does not rule out consideration of economic factors as well as technical ones. It was the AEC's contemporaneous practice to consider financial impacts as, for example, in controlling releases of radioactive materials from licensed facilities to the lowest levels "technically and economically practical." AEC Manual Chapter 0511. When the AEC spoke of a "high degree" of decontamination capability, we believe that it was guided by similar considerations. Moreover, from a policy standpoint, this makes good sense, for so long as there is adequate protection of public health and safety, it would not be prudent to expend potentially vast sums without a commensurate expectation of benefit to health and the environment.

Achieving a "high degree of decontamination capability" implies, then, that the facility should separate for disposal as much of the radioactivity as possible, using processes that are technically and economically practical. In addition, however, as the AEC's statement indicates, the residual radioactive contamination should be sufficiently low as not to endanger public health and safety.

These principles -- high decontamination capability and protection of health and safety -- are the essential benchmarks that have influenced the development of NRC's position vis-a-vis DOE on the question of the proper classification of the tank wastes and grout at Hanford.

When the question regarding classification of wastes was first raised, the NRC staff identified to DOE some approaches that might be used in distinguishing HLW from incidental waste. One approach was expressed as follows: fn 2

fn 2 Letter from Michael J. Bell, Chief, Regulatory Branch, Division of Low-Level Waste Management and Decommissioning, Office of Nuclear Material Safety and Safeguards, NRC, to Ronald E. Gerton, Director, Waste Management Division, Richland Operations Office, DOE, November 29, 1988. The letter included some "suggested criteria" involving a "good faith" effort to achieve isolation of HLW from nonradioactive salts, such an effort to be judged, as a practical matter, by considering (among other things) alternative separation processes.

As an alternative approach, we suggest that DOE attempt an overall material balance for HLW at the Hanford site, using the source-based meaning of HLW. It is hoped that this approach might provide a more efficient means of identifying those wastes subject to licensing by NRC under terms of the 1974 Energy Reorganization Act. Under this approach, if DOE could demonstrate that the largest practical amount of the total site activity attributable to "first-cycle solvent extraction" wastes has been segregated for disposal as HLW, then NRC would view the residual as a non-HLW. We would anticipate that at least 90 percent of the activity would have been separated in this way. Thus, if it can be shown that DOE has processed the waste with the intent to dispose of the HLW in a repository or other appropriate licensed facility, leaving behind only a small fraction of only moderately radioactive material, then the goals stated in 10 CFR part 50 appendix F and incorporated in the Energy Reorganization Act would have been satisfied; and the disposal of the residual would accordingly not be subject to NRC licensing.

In response, DOE considered the practicality of various waste processing alternatives and presented the results of its study by letter dated March 6, 1989. fn 3 The results were also presented at a meeting among interested parties, including the petitioners, held on August 4, 1989. (Minutes of the meeting are available for public inspection in the NRC Public Document Room) DOE's "baseline" disposal plans would have recovered all but about 12-13 million curies of cesium-137, together with lesser activities of strontium-90, transuranics, and other radionuclides. fn 4 DOE's study indicated the practicality of removing an additional 6 million curies of cesium-137 for repository disposal. DOE proposed to remove this additional 6 million curies of cesium-137. DOE also identified additional treatment alternatives, with their associated costs, which it viewed as not being economically practical. DOE's material balance showed that, after the residue from the double-shell tank wastes is grouted, 2 to 3 percent of the key radionuclides which originally entered all Hanford tanks would be disposed of as LLW in near-surface vaults. The concentrations of radionuclides in the grout would be comparable to Class C for cesium and transuranic wastes, and to Class A or B for the remainder. fn 5 DOE also noted certain engineering and institutional factors that might compensate, especially as to potential intrusion hazards, for the possibility that the total amount of waste that would be grouted would be greater than the amount of Class C waste that might be contained in a typical commercial burial ground.

fn 3 Letter from A. J. Rizzo, Assistant Manager for Operations, Richland Operations Office, DOE, to Robert M. Bernero, Director, Office of Nuclear Materials Safety and Safeguards, NRC, March 6, 1989.

fn 4 DOE noted in the March 6, 1989 letter from Rizzo to Bernero that, based on limited available analytical data, the total cesium-137 could be as much as 20 million curies versus the 12-13 million estimate. fn 5 NRC understood this statement to connote that cesium-137 and transuranic radionuclides in the residual waste would be less than the concentration limits for Class C low-level waste, as defined in NRC's requirements in 10 CFR Part 61, and that the concentration of other radionuclides would be less than the concentration limits for Class A or B low-level waste.

Based on its review of DOE's March 6, 1989 submission, the NRC staff concluded that DOE's proposed processing would remove the largest practical amount of total site activity, attributable to HLW, for disposal in a deep geologic repository. This finding was based on: (1) Past and planned treatment of the tank wastes; (2) radionuclide concentration and material balance; and (3) cost- effectiveness of additional radionuclide removal. These conclusions reflected DOE's undertakings both to achieve a high degree of separation and to provide protection of public health and safety. As a result, the staff concluded that the expected residual waste would not be high-level waste and would thus not be subject to NRC licensing authority. The staff thereupon advised DOE that NRC agreed that the criteria used by DOE for classification of the grout feed are appropriate and that the grout facility for the disposal of the double-shell tank waste would not be subject to NRC licensing authority. fn 6

fn 6 Letter from Robert M. Bernero, Director, Office of Nuclear Material Safety and Safeguards, NRC, to A. J. Rizzo, Assistant Manager for Operations, Richland Operations Office, DOE, September 25, 1989. The letter also called upon DOE to advise NRC periodically of the analytical results of samples of key radionuclides entering the grout facility, so that the classification of the waste might be reconsidered if the inventories were significantly higher than DOE had estimated. 12345

At a meeting in Richland, Washington on July 16, 1992, DOE staff presented more detailed double-shell tank waste processing options and, based on recent analyses, summarized available information on the characteristics of waste within the tanks. DOE's current estimate of the total amount of radioactivity proposed for disposal in grout in near-surface vaults is within earlier range estimates but is now believed to be nearer the upper end of the range. DOE also clarified its intention to apply criteria comparable to the Performance Objectives set out in 10 CFR part 61. Among other things, these performance objectives include numerical radiation exposure limits for protection of the general population from releases of radioactivity and requires a design to achieve long-term stability of the disposal site.

DOE intends to complete a reassessment of the tank waste processing options by March 1993. This reassessment, the NRC staff understands, will include a reexamination of the practicality of achieving higher degrees of separation, particularly with respect to those tanks that contain substantial quantities of key radionuclides.

Assuming implementation of DOE's plans as described above, the Commission concludes that any radioactive material from the double shell tanks that is deposited in the grout facility would not be high-level radioactive waste subject to NRC's licensing jurisdiction. The responsibility for safely managing those wastes rests with the Department of Energy. The basis for the Commission's conclusion is that the reprocessing wastes disposed of in the grout facility would be "incidental" wastes because of DOE's assurances that they: (1) Have been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical; (2) will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C low-level waste as set out in 10 CFR part 61; and (3) are to be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR part 61 are satisfied.

The petitioners also requested that the Commission exercise oversight to assure that the grout meets temperature requirements for low-level waste forms. They acknowledge that DOE's vault design is protective of human health and the environment if heat produced by residual radioactivity, together with heat generated from reactions during the grout process, is kept within defined limits. They present no technical data to suggest that achievement of these temperature controls presents any unusual engineering challenge. In any event, inasmuch as the Commission does not consider the grout produced in accordance with DOE's plans to be high-level waste, it does not have the authority to carry out this oversight function.

B. Procedural Issues

1. Whether Rulemaking Is Necessary and Desirable

The petitioners urge that the Commission initiate rulemaking procedures that would result in the establishment of substantive criteria for determining whether particular radioactive wastes either are or are not high-level waste. Generally, a decision whether to proceed by rulemaking (as requested) or to make determinations in individual, ad hoc litigation lies within the informed discretion of the cognizant administrative agency. Rulemaking is most appropriate where an agency seeks to establish a general principle, having prospective effect, to be applied in a wide variety of factual contexts. Where the issue before an agency involves the application of law to a very specific existing fact situation, especially where that situation is not representative of other matters that may need to be decided by the agency, then it is clearly more efficient and more to the point to decide by a process of adjudication (i.e., on a case-by-case basis).

Applying these principles to the petition at hand, the Commission has little difficulty in concluding that rulemaking is neither necessary nor desirable. Reprocessing wastes are located at only four principal locations in the United States. The Commission has previously determined that the residual contamination anticipated from proposed operations at Savannah River should be characterized as incidental waste and not high-level waste (see 52 FR 5993, Feb. 27, 1987, cited above, at footnote 1.) Wastes generated at the Idaho Chemical Processing Plant are markedly different from those at Hanford and Savannah. Therefore, if questions about classification of the Idaho wastes should arise, precedents established at Savannah River and Hanford might be difficult to apply. Any wastes at the Western New York Nuclear Service Center will require treatment in accordance with the applicable provisions of the West Valley Demonstration Project Act.

The limited practical effect of the decision -- i.e., restricted to the Hanford tanks -- is reason enough to proceed by way of adjudication instead of rulemaking. The Commission is persuaded further by the need to avoid making premature decisions with respect to the wastes stored at Hanford in single-shell tanks that are not the subject of pending treatment plans. If the Commission were to establish rules to apply to the wastes remaining in those tanks, our inquiry would have to be greatly broadened; and it might become necessary to consider a wide range of situations that might or might not ever come to pass in the future.

2. Whether the Commission Is Adequately Informed

Petitioners suggest that their proposed procedures, which include detailed tank-by-tank assessments, are necessary to ensure confidence in the treatment process employed by DOE and to build confidence that the treatment standard is being met.

The issue to be decided by the Commission is a much narrower one: It is merely to determine whether the activities being undertaken by the Department of Energy fall within the NRC's statutory jurisdiction. As in the case of other persons whose activities may fall within our regulatory sphere, the Commission may from time to time demand information so as to be able to determine whether or not to initiate an enforcement action. The NRC staff has acted in this manner in its inquiries to DOE. It has obtained and evaluated information that is relevant and material to a determination whether or not the proposed activities of the DOE are subject to NRC licensing jurisdiction. All the information obtained and evaluated has been made available contemporaneously to the public.

Moreover, as a practical matter, NRC recognized the uncertainties associated with the projected radionuclide inventories in the tank wastes and endorsed DOE plans for sampling and analyzing the grout feeds before disposal. The objective of these efforts is to control the final composition of the grout wastes. If DOE finds that it can no longer assure that these wastes will be managed in accordance with the criteria previously discussed, DOE should notify NRC.

If a standard of "largest technically achievable amount * * * will be isolated" were to be applied, then the facts submitted by DOE might not be sufficient to conclude that NRC lacked jurisdiction. However, the proper standard includes considerations of economical practicality as well. As 12345 indicated in an earlier part of this decision, the Commission has obtained information that is sufficient for this purpose.

3. Future Adjudications

The petitioners contemplate that if a rule were to be adopted in accordance with their proposal, particular determinations of how specific wastes would be characterized would be "left to individual adjudicative proceedings." The NRC infers that the "proceedings" contemplated by petitioners are licensing activities of the kinds specified in Section 189 of the Atomic Energy Act, as amended, 42 U.S.C. 2239. Adjudications in this type of proceeding are in some cases to be conducted in accordance with the hearing provisions of subpart L of 10 CFR part 2.

These procedures are often appropriate with respect to activities that are subject to NRC regulatory and licensing authority. However, the NRC is reluctant to employ them in the context that is proposed -- to determine whether NRC has jurisdiction in the first place. To do so would entail the conduct of an adjudicatory proceeding in order to see whether another adjudicatory licensing proceeding must be held. More importantly, the Commission considers that the existing record contains all the factual information needed for a decision and that no unresolved material factual issues remain that would require further proceedings.

4. Other Considerations

While both NRC and DOE have focused their attention upon the meaning of the statutory term "high-level waste" and its application to the materials in storage at Hanford, other considerations might come into play in determining whether or not DOE activities are subject to licensing. In particular, it should be recalled that NRC exercises licensing authority under section 202(4) only as to "facilities authorized for the express purpose of subsequent long-term storage of DOE- generated high-level waste." The content of individual waste tanks is by no means dispositive of the question whether the facilities for storage of the treated waste are subject to licensing. A number of other factors may be relevant and material as well: (1) What are the limits, geographically and functionally, of "facilities"; (2) have those facilities been "authorized" (and by whom is such authorization required); and (3) have those facilities been authorized "for the express purpose of subsequent long-term storage of high-level waste" where those who may authorize the facility make no express mention of high-level waste? It is not necessary for the Commission to address these questions at length in

order to dispose of the pending petition.

IV. Public Comments on the Petition

The NRC received letters from 12 commenters. Two letters were from other Federal agencies, two were from public interest groups, one was from a nuclear industry corporation, and seven were from private individuals. Most comments were opposed to the petition.

A. Process and Standards Proposed in Petition

Several comments expressed concern that granting the petition would have an adverse effect on the timely disposal of radioactive waste at Hanford. This was a concern because many of the Hanford waste tanks were seen as nearing or exceeding their design life. The provisions of the rulemaking proposed in the petition were viewed as limiting DOE's flexibility in selecting the most effective processes for waste treatment and disposal. The petitioner's request that "best available technology" be used in removing HLW material from the tank wastes was seen as ignoring costs of disposal, exposures to workers, and environmental impacts.

Some comments disputed the petitioner's claim that the rulemaking proposed in the petition would offer a better process for classification and disposal of the Hanford tank wastes. These commenters did not see any advantage in the proposed process over the process for classification and disposal currently in use. One comment suggested that the Commission's rulemaking requiring disposal of Greater-than-Class C waste in a geologic repository or Commission-approved alternative (53 FR 17710, May 19, 1989) might force DOE to allocate resources to handle the hazards, rather than to waste further time fruitlessly searching for ways to remove more and more activity from one part of the waste. The action proposed by the petitioners was viewed as not increasing the safety of disposal of the waste.

The Commission believes that adherence to the standard of technical and economic practicality generally reflects agreement with these comments.

B. Creation of a Risk-Based Classification System

Several comments, while noting that the rulemaking proposed by the petition would not do so, favored creation of a risk-based system of radioactive waste classification.

The Commission has previously addressed the costs and benefits of creating a new system of radioactive waste classification. Its rationale for not doing so is outlined in the statement of considerations to the proposed part 61 rulemaking on disposal of Greater-than Class C waste (53 FR 17709, May 18, 1988). Further consideration of these issues is beyond the scope of this proposed rulemaking action.

C. NRC Licensing Authority

Some comments focused on the licensing authority of NRC over the Hanford tank wastes. DOE stated that the rulemaking suggested in the petition would involve NRC in regulation of DOE's predisposal waste treatment and processing activities, which would be inconsistent with NRC authority to license specific DOE facilities under the Energy Reorganization Act of 1974. Another commenter stated that the proposed rulemaking was inconsistent with the statutory responsibilities of DOE and NRC. These arguments have already been discussed, and require no further response. It may be emphasized, however, that even if the Commission were found to have jurisdiction over the disposal facilities, it would not regulate either the tanks themselves or the facilities being used to process the wastes in these tanks; and there is reason for concern that implementation of the petitioner's proposal might draw the Commission improperly into regulation of those facilities.

A commenter concluded that DOE was currently in violation of 10 CFR part 30 requirements for a license because various near-surface waste disposal facilities at Hanford are being used for "long-term storage" of high-level radioactive waste. The issue is not pertinent to the subject matter of the petition. However, in any case, the comment does not take into consideration the judicial interpretation of the term in Natural Resources Defense Council, Inc. v. U.S. Nuclear Regulatory Commission, 606 F.2d 1261 (D.C. Cir., 1979). The D.C. Circuit Court of Appeals ruled in this case in support of NRC's position that the tanks have not been authorized for use as long-term storage or disposal and are, therefore, not subject to NRC licensing.

D. Public Input

A number of comments stressed the importance of adequate public input into decision making regarding disposal of the Hanford tank wastes. Some called for public hearings on this subject to be held in the Pacific Northwest. One commenter noted that the EIS which was done for Hanford provided the 12347 opportunity for public comment. Another commenter believed that the Commission's rulemaking procedures did not offer the public a better opportunity for input than does the current licensing procedure.

As indicated in the Discussion above, the NRC's review of the situation with respect to the double-walled tanks has been carried out publicly from the start. Meetings with DOE have been open, and at least one of the petitioners (the State of Washington) has been provided advance notice and an opportunity to attend. Documents have been placed in the Public Document Room and have been made available for public inspection. It appears to the Commission that the essence of the issue concerns the appropriate standard for evaluating whether certain

wastes should be regarded as high-level waste or not. Sufficient factual information is available to carry out these evaluations. Also, the petition for rulemaking has afforded an opportunity for views to be expressed with respect to the appropriateness of the standard.

A decision that NRC lacks licensing jurisdiction does not mean that opportunities for public input will be denied. As DOE undertakes its waste management activities, it will afford opportunities for public participation to the extent required by its own enabling statutes, regulations, and orders.

E. Other Comments
One commenter took exception to the petitioner's claim that the radioactive inventory of the Hanford tank wastes was inadequately known. The commenter believed that the contents of the tanks can be bounded well enough to judge the relative safety of various disposal options.

The Commission considers the available information to be sufficiently bounded to enable it to conclude that DOE's proposed operations (with respect to the material stored in the double-shell tanks) can result in the removal from the Hanford double-shell tanks of as much of the radioactive waste as may be technically and economically practical, and that the applicable regulatory objectives have been satisfied. Once these judgments are made, it is not the NRC's role to judge the relative safety of various disposal options, and we decline to do so.

One comment stated that while the petition was aimed solely at the Hanford tank wastes, its provisions could potentially affect all radioactive wastes from reprocessing, including those at Savannah River, West Valley, and the Idaho National Engineering Laboratory. As the waste management programs at these other sites are in different stages of implementation, the impacts of the provisions would vary from site to site. As indicated above, the Commission is sensitive to this consideration yet believes that the specific case at hand only needs to be addressed at this time.

Some comments urged the Commission not to change the present definition of HLW. The Commission is not changing the present definition.

V. Conclusion

For the reasons presented in this document, the petition for rulemaking is denied.

Dated at Rockville, Maryland this 26th day of February, 1993.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,
Secretary of the Commission.
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00450329
Title: Receipt of Byproduct and Special Nuclear Material, Vol. 57, No. 204, 57 FR 47978
Date: Wednesday October 21, 1992
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Rules and Regulations
CFR: 10 CFR Part 50
NUMBER: RIN 3150-AE04
November 20, 1992.
CONTACT: LeMoine J. Cunningham, telephone (301) 504-1086, or Paul H. Lohaus on (301) 504-2553. U.S. Nuclear Regulatory Commission, Washington, DC 20555.
Final rule.
The Nuclear Regulatory Commission is amending its regulations governing the condition of licenses for production and utilization facilities to allow a reactor licensee to receive back byproduct and special nuclear material that is produced by operating the reactor after that material has been sent off-site for processing, such as compaction or incineration.

WORD COUNT: 7,447
TEXT:
SUPPLEMENTARY INFORMATION:

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I. Background.

II. Response to Public Comments on the Proposed Rule.

I. Background

On April 24, 1992 (57 FR 15034), the Commission published a proposed rule that would amend its regulations in 10 CFR 50.54, ''Conditions of licenses.'' This addition to the regulations is needed primarily because of changing circumstances surrounding the treatment, storage, and disposal of low-level radioactive waste (LLW) generated by operating nuclear power reactors. At the time when most operating licenses were issued, the Commission expected that LLW would be promptly treated and sent off-site for disposal in a licensed LLW disposal facility. Therefore, licensees were not authorized to receive byproduct or special nuclear material except in the form of sealed sources for analysis, calibration, or other special purposes, in the form of fuel for use in the reactor, or associated with radioactive apparatus or components.

Except for LLW generated in Michigan, where generators have been denied access to LLW disposal capacity since November 10, 1990, companies providing nuclear power reactors with off-site LLW processing and volume-reduction services currently transfer treated waste directly to one of three operating commercial LLW disposal facilities. These companies providing off- site treatment and volume-reduction services may have several reasons for needing to return treated LLW to the generator, rather than shipping it to a disposal site. First, access to LLW disposal facilities may be restricted for the generator whose waste has been treated. Under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA), States with operating disposal facilities may deny access to generators in other States. Second, the licensee offering off-site services may not have adequate capacity for storing the waste until disposal. Finally, the legal relationships among States and regions, established under the various compacts ratified by Congress, in conjunction with the LLRWPAA, may force return of treated LLW to the generator in order to ensure that the waste is disposed of at the appropriate disposal facility. Accordingly, although a reactor licensee may send its LLW off-site to another licensee for treatment (e.g, compaction, or incineration), the licensee treating the waste will have a need to return the waste to the generator, but may not do so because the generator lacks authority to receive it.

The Commission identified two principal options for addressing this issue. The first option was to use a case-by-case licensing-action approach, either by amending each facility license, or by issuing a separate license under 10 CFR part 30. This action would require each facility licensee either to request an amendment to its operating license, authorizing the receipt of processed LLW, or to request a separate license. However, addressing the issue for each licensee individually would be inefficient, requiring both the licensee and NRC to expend significant resources.

The second option, adopted by the Commission as the final rule, amends 10 CFR 50.54, ''Conditions of licenses,'' to allow reactor licensees to receive back LLW generated at the plant and shipped off-site for processing. This approach not only resolves the authorization issue, but also eliminates the need for significant NRC and licensee efforts to complete and approve the amendment requests to part 50 licenses, and ensures that a uniform approach is applied in all cases.

The Commission considers the final rule a minor amendment that does not represent any change in Commission regulatory policy regarding radioactive waste. On October 16, 1981, the Commission published its policy statement on LLW volume-reduction (pg 47979) (46 FR 51100), in which it called upon all generators of radioactive waste to reduce the volume of LLW for disposal, to extend the life of disposal sites and alleviate storage concerns. The final rule will further enhance licensees' options to reduce the volume of waste, by using services performed off-site and permitting the return of the treated waste to the generator. The Commission anticipates that many reactor licensees will take steps to process or reduce the volume of generated LLW, typically by off-site compaction and incineration, before storing the waste at their facilities, on an interim basis.

However, the Commission does not look favorably on long-term on-site storage. The final rule is intended to ensure that licensees will have adequate short-term on-site storage capacity for self- generated LLW, until permanent disposal capacity is available. The commission does not believe this minor amendment represents a change in the stated Commission position that it '' does not look favorably on long-term on-site storage.'' The Commission expects licensees to ship generated wastes for disposal to the extent possible. Storage of LLW should be used only for the short-term management of LLW, when disposal is interrupted or unavailable.

The final rule applies to both power and non-power reactor licensees. The final rule does not authorize the receipt of any material recovered from the reprocessing of irradiated fuel.

In addition to publishing the proposed rule in the April 24, 1992,Federal Register NRC sent a copy of the proposed rule to all Agreement and non-Agreement State radiation control program directors, all State liaison officers, and those organizations on the low-level waste compact distribution list, on May 26, 1992. The comment period ended on July 8, 1992. Various comments were received, all of which were evaluated in developing the final rule.

II. Response to Public Comments on the Proposed Rule

The Commission received a total of 31 comment letters on the proposed rule. Responses were received from utilities or their counsel (19); nuclear power and nuclear material user-groups (2); State departments of health and radiation protection agencies (2); public interest groups (2); disposal facility operators and developers

(2); and private citizens (4). Copies of these letters are available for public inspection and copying for a fee at the NRC Public Document Room at 2120 L Street NW. (Lower Level), Washington, DC.

Of the 31 letters received, 26 endorsed adoption of the proposed rule. Many of these commenters cited the benefits from off- site waste processing technology that allows operating reactor licensees to maximize current storage capacity and minimize radioactive waste volumes. They emphasized that implementation of the rule is an efficient and cost-effective solution to a practical problem, and several favorably cited the rule's timeliness and potential benefits in light of future uncertainties concerning LLW disposal capacity. One commenter, after endorsing the proposed rule, encouraged NRC to become more involved in the licensing process for new disposal sites. Both Illinois and Arkansas, the only states to provide comments concerning the proposed rule, endorsed the rule. Approximately 20 specific questions or suggestions were received that address the proposed rule. The majority of comments received may be grouped into one of four basic categories that include:
(1) Clarification and enhancement of the proposed rule,
(2) Waste accountability at the processor licensee,
(3) Radioactive waste transportation concerns, and
(4) Worker health and safety.

Public comments and NRC responses follow:

Comment: Six commenters requested that the rule be clarified to authorize reactor licensees to receive back processed waste originally generated by any reactor or reactors located at the same site. Commenters pointed out that some plants do not distinguish one unit's waste from an adjacent unit's waste when shipping off-site for treatment, and that oftentimes, wastes generated at a particular site with multiple operating reactors will be commingled. They argued that the proposed rule, if strictly interpreted, would not allow a reactor licensee to receive back processed waste containing waste from another reactor located at the same site. Three commenters explicitly requested that NRC change the proposed rule to permit wastes generated at a single site to be consolidated. Two of the three, Edison Electric Institute and the law firm of Winston & Strawn, provided NRC with specific language for such clarification. Three other commenters concurred with this recommendation by citing Edison Electric Institute's submittal to NRC concerning the proposed rule.

Response: The Commission agrees that the rule should permit radioactive waste from multiple units of one licensee at a particular site to be received back under the license of any of the units at that site. The Commission has revised the final rule to reflect this change. The following language is added to modify Sec. 50.54(ee)(1) of the final rule: ''Each license issued under this part authorizing the possession of byproduct and special nuclear material produced in the operation of the licensed reactor includes, whether stated in the license or not, the authorization to receive back that same material, in the same or altered form or combined with byproduct of special nuclear material produced in the operation of another reactor of the same licensee located at that site '' Comment: One commenter suggested that the proposed rule be modified to authorize the receipt back of byproduct or special nuclear material from a non-licensed entity that is authorized to possess the radioactive material, but is not ''a licensee of the Commission or an Agreement State,'' as the proposed rule had originally stipulated. The commenter suggested that a common or contract carrier transporting source or byproduct radioactive material may not be able to return such material to the reactor licensee generating the material, although this may be necessary in several situations, such as the return of waste because of ineffectual waste packaging. Similarly, the commenter contended, a non-licensed government agency, such as the Department of Energy, may be unable to return treated waste to a reactor licensee if a strict interpretation of the proposed rule were adopted.

Response: The Commission agrees that the rule should permit receipt back, by a reactor licensee, of byproduct and special nuclear material produced by the reactor licensee from a non- licensed entity that is authorized to possess the material. The Commission has revised the final rule to reflect this enhancement. In Sec. 50.54(ee)(1) of the final rule, authority has been granted to power and non-power reactor licensees to receive back byproduct and special nuclear material produced in the operation of the reactor ''from a non-licensed entity authority to possess the material,'' as well as from Commission or Agreement State licensees.

Comment: One commenter suggested that NRC modify the proposed rule to authorize the transfer of byproduct or special nuclear material for volume-reduction or decontamination purposes among reactor sites with a common licensee. The commenter stated that '' under the Commission's restrictive interpretation of the scope of reactor operating licensees, a reactor (pg 47980) licensee may not receive LLW for processing that was produced in the operation of a reactor for which it also has license responsibilities.''

Response: The Commission believes authorization permitting a reactor licensee to receive byproduct or special nuclear material, at one reactor site, that is produced at another reactor site for which it also has licensee responsibilities for the purpose of performing decontamination or volume-reduction services, is beyond the scope of this rulemaking. The Commission does not agree that the proposed rule should be modified to allow transfer of byproduct and special nuclear material among reactor sites for this purpose. As a matter of policy, the Commission opposes practices at reactor facilities that may divert the attention of licensee management from the primary task of safe operation of the power reactor. Accordingly, the Commission believes that such situations should continue to be reviewed and authorized on a case-specific basis.

Comment: One commenter suggested that NRC clarify that, if the proposed rule is adopted, the final rule will also authorize the transfer of decontamination equipment that is slightly contaminated with byproduct or special nuclear material among reactor sites with a common license.

Response: The Commission believes this suggestion is beyond the scope and intent of the rulemaking. Accordingly, the Commission does not agree that the proposed rule should address this issue. However, part 50 licenses typically contain conditions that permit transfer of decontamination equipment among reactor sites with a common license. Licenses which permit the licensee to '' receive, possess any byproduct, source or special nuclear material associated with radioactive apparatus or components,'' may authorize the receipt of transferred decontamination equipment.

Comment: Three commenters expressed concern that the rule will result in an increase in the number of miles traveled by radioactive waste on our nation's highways, and that this is not in the public interest. One commenter suggested that potential hazards are greater from the transportation of radioactive waste on the return leg from a processor to a generator, because the radioactive material within the waste has been concentrated.

Response: The proposed rule may result in an increase in the number of miles radioactive waste is transported. The additional dose associated with this transportation, however, represents only a small increase in doses (that are already small) from transportation activities. Further, all waste shipments must meet the applicable regulatory requirements of the U.S. Department of Transportation and the U.S. Nuclear Regulatory Commission. The regulations require the packaging to be commensurate with the potential hazard of the contents.

Comment: Two commenters suggest that off-site processing creates health risks to ''additional attending personnel.'' One commenter, therefore, advocates on-site processing of waste. This commenter contends that on-site processing minimizes the number of people exposed to the hazards of radiation; additional handling, storage, and transportation will result in higher exposure to personnel and greater risks of harmful effects to the public.

Response: All processing, storage, and transportation of LLW must meet regulatory requirements. This minor rule change, which authorizes receipt of waste, does not change any of the requirements concerning waste processing, storage, and transportation. The collective occupational exposure (dose) would be essentially the same for the waste processing whether the processing were done on-site or off-site, assuming that the same process were used in either location. Additional handling for shipping and receiving of wastes sent off- site for processing is needed; however, this incremental dose from this activity would be a small fraction of the dose for waste processing and other shipping and receiving activities. The corresponding doses to members of the public would also represent a very small incremental increase in doses that already are very small.

Comment: Several comments were received about accountability of waste at the waste processor, and subsequent changes to the waste as a result of waste processing activities. Specifically, two commenters suggested that the possible intermingling of wastes at the processor facility would make difficult the task of ensuring that waste received from a particular generator is returned to that generator alone, as required by the rule. Another commenter expressed concern that accompanying waste manifests may become inaccurate as a result of changes to the waste by the processor licensee.

Response: An individual reactor licensee's decision to ship waste off-site for processing, with the intention of receiving back such LLW for temporary storage, will require the reactor licensee to coordinate with the waste processor, to ensure that waste shipped back to the facility fulfills the criteria of the new rule and any other applicable regulations. Processors who choose to accept reactor waste intended for return back to the reactor site licensee currently satisfy a host of substantive requirements governing transfer and recordkeeping of radioactive waste cited in 10 CFR 20.311, ''Transfer for disposal and manifests,'' or appendix F to new Secs. 20.1001 through 20.2401, ''Requirements For Low- Level-Waste Transfer for Disposal at Land Disposal Facilities and Manifests.'' These rules require that manifests accompanying radioactive waste shipments to licensed waste processors and land disposal facilities. The manifest must indicate the identification of the waste generator, the physical description of the waste, waste volume, waste radionuclide identity and quantity, total radioactivity, and the principal chemical form of the waste. In addition to the manifesting requirements, licensed waste processors who treat or repackage waste must also fulfill waste classification, identification and labeling requirements found in 10 CFR 61.55, 61.56, and 61.57.

The final rule exclusively authorizes reactor licensees to receive back LLW sent off-site for treatment. The final rule does not allow a reactor site to accept any waste that is not originally generated at the site, and the processor must fashion its operations to comply with this condition. The individual processor licensee, when receiving waste intended for return to the reactor site, may have to perform individual ''batch'' processing, for the reactor licensee to accept processed waste in compliance with the rule.

Comment: One commenter pointed out that waste processing may result in changes to waste classification, and in fact, may concentrate radioactivity enough to approach or exceed greater-than- class-C waste concentrations. This commenter was concerned that these potential shifts in waste classification might go unreviewed. This commenter also expressed concern that waste processing operations may produce waste products containing mixed waste and may result in the release of gases or particulates into the atmosphere. Waste processing operations may increase the toxicity or concentration of the waste, this commenter argued, suggesting that this is an undesirable outcome from the perspective of the Host State responsible for ultimate disposal of the treated waste.

Response: If a reactor licensee intends to receive back LLW shipped off-site from its facilities and is to comply with the rule, the processor licensee will have {pg 47981} to segregate wastes by individual reactor

licensee. Excluding this segregation operation, the rule will not affect waste processor licensee generated waste product or operations. The final rule will not result in changes to waste product currently generated by waste processors. The final rule may lead processors to treat some reactor-generated wastes in individual ''batches,'' to allow return of the waste back to the reactor licensee, but otherwise, processor licensees will simply continue performing LLW volume-reduction activities, as they have before promulgation of the final rule. NRC and Agreement State regulations are in effect which authorize treatment and handling operations at waste processor licensee facilities and ensure that these operations are conducted safely and without adverse effects on the environment. These conditions are not affected by the final rule, and will continue in force after promulgation of the final rule.

Comment: One commenter expressed concern that it was unclear what authority had responsibility to oversee waste processing and enforcement at the processor. This same commenter questioned whether waste ownership or title to the waste may, in fact, become obscured as a result of waste being shipped and managed by several licensees.

Response: NRC will continue to license and inspect processor licensees in non-Agreement States, and the Agreement State authorities will continue to license and inspect their licensees. Tracking and manifest requirements will continue to apply to reactor-generated wastes, and title to the waste and waste ownership can be adequately communicated and documented between reactor licensees and processor licensees. Before the final rule, waste processors have received waste from reactor licensees, have processed the waste to reduce its volume, and have repackaged and shipped for disposal the final, volume-reduced waste product. The transfer of waste from generator to processor and/or broker, and from processor and/or broker to a disposal facility licensee, has not resulted in a significant number of disputes concerning transfer of title or possession of radioactive wastes, among licensees. The contractual arrangements between licensees and the laws of the various States pertaining to transfer of ownership continue to provide licensees with the means by which they can negotiate the transfer of title to the waste. The Commission does not envision any difficulties concerning radioactive waste title transfer originating from promulgation of the final rule.

Comment: One commenter asked whether the language in the proposed rule prohibiting receipt back of material ''recovered from the reprocessing of irradiated fuel'' could be applied to LLW containing fuel fines from damaged fuel rods. The commenter questioned whether NRC prohibits off-site treatment of such wastes, and whether the generator of such wastes may refuse to accept back such wastes once processed. The commenter asked whether the term ''reprocessing of irradiated fuel'' is ''narrowly'' interpreted by the NRC to refer only to the reprocessing of spent fuel rods.

Response: The proposed rule contains no new authorizations for, or prohibitions against, LLW processing. The term ''material recovered from the reprocessing of irradiated fuel'' does refer to the reprocessing of ''spent fuel rods'' and does not apply to LLW containing fuel fines from damaged fuel rods. NRC does not prohibit off-site treatment of LLW that may contain very small quantities of fuel fines from damaged fuel rods. The rule authorizes, but does not require, the receipt of waste. Reactor licensees are not authorized to reprocess irradiated fuel or to possess the wastes from such reprocessing. (Wastes from fuel reprocessing are, by regulatory definition, high-level wastes, not LLW.) The intent of the proposed rule is to allow reactor licensees to receive the radioactive materials that they produce and that they already are allowed to possess. The sentence in question, concerning fuel reprocessing, was added to the proposed rule to make it clear that reactor licensees are not authorized to receive materials that they are not already authorized to possess (reprocessing wastes).

Comment: One commenter expressed concern that by allowing all reactor licensees to receive back waste after processing, many States will simply require these licensees to store all other LLW generated within the State.

Response: The Commission does not believe this issue is germane to the final rule. The final rule affects license conditions allowing receipt of radioactive material, but does not alter conditions concerning storage of radioactive waste. The rule addresses the receipt back of LLW generated only at reactor sites, and shipped off-site for processing. The rule does not authorize the storage of LLW, generated throughout the State, at reactor sites.

Comment: One commenter inquired as to the actions to be taken if a generator refuses to accept waste back after processing.

Response: NRC does not consider this a likely scenario. Both the generator and the processor involved in the transfer of waste for treatment will likely have agreed, by contract, on the terms of treatment and transfer of the LLW. If the waste, on return to the generator, is not accepted by the generator, the processor licensee would have grounds to seek legal recourse to force the generator to take possession of the treated LLW. However, if a threat to the public health and safety were to present itself at any time as a result of a reactor licensee's refusal to accept waste from a processor shipped off-site for processing, NRC would use its authority to compel the appropriate party to take possession of the waste, and store it safely.

Comment: One commenter suggested that a loophole in the Low-Level Radioactive Waste Policy Act of 1980 allows a licensee to forward a shipment of radioactive material to another State to be stored or treated, and then avoid all responsibility for disposal of the material by declaring the material a waste. The 1980 Act places the receiving State in an untenable position by requiring it to provide disposal capacity for wastes its licensees become burdened with in this manner.

Response: The 1980 Act encourages States to form regional compacts to collectively provide for disposal capacity of LLW. These compacts, authorized by Congress, were allowed to exclude waste generated outside their borders, beginning January 1, 1986. This date was later extended to January 1, 1993, when Congress approved the Low-Level Radioactive Waste Policy Amendments Act of 1985. The 1985 Act further authorizes that each State shall provide disposal capacity for LLW '' generated within '' the State. Accordingly, generators who ship radioactive material out-of-state for processing, and then declare that material to be LLW, will likely be unable to shift responsibility for the disposal of their waste. Therefore, the Commission does not consider this to be a significant issue, nor one which is affected, in any way, by the final rule.

Comment: One commenter suggested that the rule clarify considerations for non- reactor licensees concerning receipt of waste back at their facilities after processing.

Response: The Commission has drafted the final rule to apply to reactor licensees, only. Reactor licensees have reported that processor licensees are (pg 47982) unwilling to accept reactor-generated waste without some assurance that reactor licensees will be authorized to receive back processed LLW initially generated at the reactor facility. Currently, no problems have been identified concerning parts 30, 40, and 70 licensees and the return of processed LLW to their facilities. The Commission can address this issue in the future if parts 30, 40, and 70 licensees encounter problems in this area.

Comment: One commenter noted that currently available on-site volume-reduction technology is more cost-effective than the ''double-handling'' mandated by off-site processing. Response: This rule does not mandate off-site processing. The licensee is free to evaluate the cost effectiveness of a given technology or process and choose either on-site or off-site processing.

Comment: Two commenters suggested that the rule be decided in conjunction with the proposed rule on export and import of radioactive waste. Commenters were concerned that wastes may be imported for disposal from NRC licensees operating abroad.

Response: The Commission does not agree that these concerns are applicable to the final rule. The Commission does not believe the final rule will have any impact on the proposed rule on export and import of radioactive waste, nor will the proposed rule on export and import of radioactive waste impact this rulemaking.

Comment: Two commenters argued that the implications of the rule are uncertain in the aftermath of the Supreme Court's decision rejecting the ''Take Title'' provision of the LLRWPAA. One commenter asked whether States, under the proposed rule and in light of the Supreme Court's decision inNew York v. United States, could refuse to allow interim on-site LLW storage.

Response: On June 19, 1992, the U.S. Supreme Court issued its decision on the New York challenge to the constitutionality of the LLRWPAA. Although the Supreme Court decision, in this case, is currently being evaluated for its possible general impact on the management of LLW in this country, the Supreme Court decision does not impact the final rule.

Comment: One commenter expressed concerns that volume reduction of a ''source'' containing some intrinsic value would lose its remaining value after being compacted to reduce the volume of the waste.

Response: The Commission does not believe this issue is pertinent to the final rule.

Comment: One commenter in Florida expressed concern that the proposed amendment would allow nuclear power plants, including Turkey Point in Florida, to store LLW on- site for an indefinite period. The commenter believes that South Florida's unique hydrology and geology raise serious questions about its suitability for storage of LLW. The commenter states that any decisions by NRC to allow LLW to be stored at reactor sites should be made on a site-specific basis and that an environmental impact statement (EIS) should be prepared under the National Environmental Policy Act (NEPA) for Turkey Point, because the original EIS (in 1972) did not address storage of LLW. One commenter, from Michigan, expressed concern that, given the importance of the Great Lakes, nuclear power plants in the Great Lakes area be phased out so that no further waste accumulates.

Response: Current reactor license conditions allow licensees to store wastes to store wastes generated in the operation of the reactor. While the rule authorizes reactor licensees to receive back waste shipped off-site for processing, the final rule makes no changes to existing requirements concerning storage of LLW, nor does it modify waste processing or transportation requirements. Site-specific concerns associated with storage of wastes authorized under terms of existing licenses should be addressed on a case-specific basis.

Finding of No Significant Impact: Availability

The Commission previously determined that the selected action was of the type described in the categorical exclusion of 10 CFR 51.22(c)(2). After having received several comments addressing the transport and storage of processed LLW, however, the Commission has chosen to conduct an environmental assessment pertaining to these environmental concerns and the consequences of the proposed rule.

The Commission has determined, under the National Environmental Policy Act of 1969, and the Commission regulations in subpart A of 10 CFR part 51, that this rule would not be a major Federal action significantly affecting the quality of the human environment and therefore, an environmental impact statement is not required. The handling and temporary storage of concentrated waste will not significantly increase risks to workers or

the public. Similarly, this rule will not pose significant risks to the public or the environment resulting from additional miles traveled by radioactive wastes on our Nation's highways. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection and/or copying for a fee at the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC. Single copies of the environmental assessment and the finding of no significant impact are available from Richard H. Turtil, U.S. Nuclear Regulatory Commission, Washington, DC 20555, (301) 504-3447.

Paperwork Reduction Act Statement

This final rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501et seq.). Existing requirements were approved by the Office of Management and Budget approval number 3150-0011.

Regulatory Analysis

The Commission has considered alternatives to, as well as the costs and benefits of, the final regulation. There is no alternative to amending the regulations that would satisfy questions concerning the legality of transfer on a generic basis. The final regulation will not impose any additional cost nor burden on a licensee or other individual. The final rule is intended to facilitate actions necessary to ensure that licensees will have adequate short-term on-site storage capacity for LLW, until permanent disposal is available. The Commission does not look favorably on long-term on-site storage. The foregoing constitutes the regulatory analysis for the final rule.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this rule does not have a significant economic impact on a substantial number of small entities. The rule does not affect small entities. The final regulation is entirely permissive in nature and will predominately affect large entities, nuclear power reactor licensees, and persons who provide volume-reduction services to these licensees.

Backfit Analysis

The Commission has determined that the backfit rule, 10 CFR 50.109, does not apply to this final rule, and therefore, that a backfit analysis is not required for this final rule, because these amendments do not involve any provisions that would impose backfits, as defined in 10 CFR 50.109(a)(1). {pg 47983}

List of Subjects in 10 CFR Part 50

Antitrust, Classified information, Criminal penalty, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 552 and 553, NRC is adopting the following amendment to 10 CFR part 50.

PART 50- DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. The authority record for part 50 continues to read as follows:

Authority: Secs. 102, 103, 104, 105, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 50.10 also issued under secs. 101, 185, 68 Stat. 936, 955, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.13, and 50.54(dd), and 50.103 also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138). Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 88 Stat. 1245 (42 U.S.C. 5844). Sections 50.58, 50.91, and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80-50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); Secs. 50.5, 50.46(a) and (b), and 50.54(c) are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); Secs. 50.5, 50.7(a), 50.10(a)-(c), 50.34(a) and (e), 50.44(a)-(c), 50.46(a) and (b), 50.47(b), 50.48(a), (c), (d), and (e), 50.49(a), 50.54(a), (i), (i)(1), (l)-(n), (p), (q), (t), (v), and (y), 50.55(f), 50.55a(a), (c)-(e), (g), and (h), 50.59(c), 50.60(a), 50.62(b), 50.64(b), 50.65, and 50.80 (a) and (b) are issued under sec. 161i, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and Secs. 50.9, 50.49(d), (h), and (j), 50.54(w), (z), (bb), (cc), and (dd), 50.55(e), 50.59(b), 50.61(b), 50.62(b), 50.70(a), 50.71(a)-(c) and (e), 50.72(a), 50.73(a) and (b), 50.74, 50.78, and 50.90 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. In 50.54, paragraph (ee) is added to read as follows:
Sec. 50.54 Conditions of licenses.
(ee)(1) Each license issued under this part authorizing the possession of byproduct and special nuclear material produced in the operation of the licensed reactor includes, whether stated in the license or not, the authorization to receive back that same material, in the same or altered form or combined with byproduct or special nuclear material produced in the operation of another reactor of the same licensee located at that site, from a licensee of the Commission or an Agreement State, or from a non-licensed entity authorized to possess the material.

(2) The authorizations in this subsection are subject to the same limitations and requirements applicable to the original possession of the material.

(3) This paragraph does not authorize the receipt of any material recovered from the reprocessing of irradiated fuel.

Dated at Rockville, Maryland, this 14th day of October, 1992.
For the Nuclear Regulatory Commission.
James M. Taylor,

Executive Director for Operations.
INTERNAL DATA: FR Doc. 92-25504; Filed 10-20-92; 8:45 am; BILLING CODE
7590-01-M

Citation 338

<DIALOG File 669: (c) U.S. Govt Printing Office>
00442088
Title: New England Coalition on Nuclear Pollution, Inc.; Receipt of Petition for Rulemaking, Vol. 57, No. 142, 57 FR 32743
Date: Thursday, July 23, 1992
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Proposed Rules
CFR: 10 CFR Part 61
NUMBER: Docket No. PRM-61-2
Submit comments by September 21, 1992. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.
CONTACT: Michael T. Lesar, Chief, Rules Review Section, Rules and Directives Review Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7758 or Toll Free: 800-368-5642. Submit written comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.

For a copy of the petition, write the Rules and Directives Review Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

The petition and copies of comments received may be inspected and copied for a fee at the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC.
Petition for rulemaking; Notice of receipt.
The Nuclear Regulatory Commission (NRC) is publishing for public comment a notice of receipt of a petition for rulemaking dated April 25, 1992, which was filed with the Commission by New England Coalition on Nuclear Pollution, Inc. The petition was docketed by the NRC on May 4, 1992, and has been assigned Docket No. PRM-61-2. The petitioner requests that the NRC amend its regulations regarding waste classification of low-level radioactive waste to restrict the number and types of waste streams which can be disposed of in near- surface disposal facilities. The petitioner also requests that the NRC prepare a supplemental Environmental Impact Statement (EIS) to the original EIS prepared for 10 CFR part 61 (December 27, 1982; 47 FR 57446).

WORD COUNT: 1,745
TEXT:
SUPPLEMENTARY INFORMATION:

Background
The Nuclear Regulatory Commission (NRC) has established specific requirements for licensing the land disposal of radioactive waste in 10 CFR part 61. These regulations specify the technical requirements that must be met for the near-surface disposal of waste. The technical requirements for waste classification are contained in 10 CFR 61.55.

Classification of waste for near-surface disposal is determined by the concentration of long-lived radionuclides whose potential hazard will continue long after precautions such as institutional controls, improved waste form, and deeper disposal are no longer effective and the concentration of short-lived radionuclides for which these precautions are effective. The three major classifications of waste for near-surface disposal are described as follows:

(1) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in Sec. 61.56(a). If Class A waste also meets the stability requirements set forth in Sec. 61.56(b), it is not necessary to segregate the waste for disposal.

(2) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in Sec. 61.56.

(3) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirement set forth in Sec. 61.56.

Petitioner

The New England Coalition on Nuclear Pollution, Inc., is a non-profit, tax-exempt organization which was incorporated in April 1971. The organization is based in Brattleboro, Vermont, and has members throughout the country. The Coalition has members in the following states hosting, or considering hosting, a low-level radioactive waste disposal facility: California, Connecticut, Illinois, Massachusetts, Maine, North Carolina, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, South Carolina, Texas, and Vermont.

Reasons for the Petition

The petitioner believes that the waste classified for near-surface disposal, which the petitioner terms ''low-level'' waste, comprises both long-lived and short-lived material. The petitioner believes that this combination of material would make facility engineering extremely difficult, if not impossible. The petitioner stated that recent studies by Rogers & Associates for the Vermont Low-Level Radioactive Waste Authority have shown that, in the state of Vermont, 6 already-separate waste streams account for more than 99% of all of the long-lived activity in the ''low-level'' waste stream, but only about 12% of the total waste volume. The petitioner believes that these studies also showed that, under modeling scenarios different from those used by NRC, these waste streams would cause an earth mounded concrete vault facility to fail. The petitioner believes that the results would not be any different for any near-surface facility design. The studies also showed that of the 6 waste streams, 3 are Class A, 2 Class B, and only 1 Class C. The petitioner believes that the problematic waste streams do not directly correspond to the current NRC waste classification system, though most of the activity is found in the Class C waste stream. The petitioner believes that siting these long-lived materials in near-surface facilities, such as those planned in most areas of the country, is unwise. {pg 32744}

The Petition

The petitioner requests that the NRC revise its regulations concerning the classification of waste for near-surface disposal to restrict the number and type of waste streams which may be disposed of in near-surface disposal facilities. The petitioner believes the requested changes are necessary because of significant new information concerning inadvertent intrusion into low-level radioactive disposal facilities that was not available at the time the original environmental impact statement for 10 CFR Part 61 was developed. The petitioner also believes that the NRC must develop a supplemental environmental impact statement (EIS) concerning the land disposal of radioactive waste because, according to the petitioner, the premises leading to the conclusions reached in the original EIS have substantively changed.

The petitioner is basing this petition on what the petitioner believes are three critical changes in the reasoning which resulted in the current regulations.

1. The original EIS was based on a 500 mrem/year dose to ''inadvertent intruders,'' derived from the then current guidance from ICRP, NCRP, EPA and NRC. The petitioner cites present guidance that would limit the dose to inadvertent intruders to a level of 100 mrem (See Sec. 20.1301, 56 FR 23375; May 21, 1991), rather than 500 mrem per year. The waste classification system NRC adopted was dependent on the level of intruder doses allowed at that time. The EIS analysis showed that setting the dose limits lower than 500 mrem would result in about 10% of the waste stream being declared unacceptable for disposal in the base case shallow-land burial facility. Therefore, the petitioner believes it is clear that lowering the dose limit would impact the final waste classification analysis.

2. The petitioner states that the NRC considered three intrusion events based on evaluation of the broad range of events possible, those considered by other investigators, and the likelihood of occurrence. According to the petitioner, the final EIS notes that NRC did not directly consider the probability of various intrusion events occurring except to the extent of considering reasonable, probable productive uses for which the land could be used. The petitioner believes that this was a matter of regulatory discretion rather than of scientific data. The original analysis was also based on the assumption that all intrusion would be inadvertent. However, the petitioner believes that this assumption is not valid because, according to the petitioner, there are many credible scenarios that would involve deliberate intrusion. The petitioner states that recent studies in Vermont show that, when intrusion is deliberate, the ability of near-surface facilities to contain all of the currently classified low-level radioactive waste stream is questioned. The petitioner requests that the NRC reconsider its decisions concerning possible intrusion scenarios.

3. The petitioner believes that the cost differential between the shallow-land burial facility and the geologic facilities needed to dispose of waste unacceptable for near-surface disposal was exaggerated and should be revised. At the time of the original EIS, it was assumed that low-level radioactive waste would be disposed of in shallow-land burial facilities on an ''eastern humid site,'' based on the ''shallow-land burial'' disposal design. Shallow-land burial was assumed to be substantially cheaper than alternative facility designs, and cost considerations were a factor in determining which wastes should be disposed of at facilities licensed under 10 CFR part 61. However, according to the petitioner, none of the states or compacts east of the Mississippi is contemplating use of the shallow-land burial design. All of these states and compacts intend to use some form of facility engineering that would increase the cost of low-level waste disposal.

The petitioner believes that the supplement to the EIS would result in a small component of the waste currently considered acceptable for near-surface disposal being declared unacceptable. By removing additional waste streams than those originally eliminated by NRC, the petitioner believes that two major difficulties can be addressed without benefit of substantial but baseless speculation. Potential intruder doses could be held well within regulatory limits, while mistakes in scenario prognostication would not result in harm to intruders or to the public.

The petitioner believes that the reclassification of the waste by NRC would enable the NRC to specify the materials that are truly ''low-level,'' and ensure that safety enhancements are required for that small portion of the ''low- level'' waste stream that cannot safely be disposed in near-surface facilities. Dated at Rockville, Maryland, this 16th day of July 1992.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.
INTERNAL DATA: FR Doc. 92-17262; Filed 7-22-92; 8:45 am; BILLING CODE
7590-01-M

Citation 339

<DIALOG File 669: (c) U.S. Govt Printing Office>
00439917
Title: Availability of Proposed Revision to Staff Technical Position Regarding Concentration Averaging and Encapsulation, Vol. 57, No. 126, 57 FR 29105
Date: Tuesday, June 30, 1992
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Notices
CONTACT: W.R. Lahs, Division of Low-Level Waste Management and
Decommissioning, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone (301) 504-2569.

Dated at Rockville, Maryland, this 17th day of June 1992.

For the Nuclear Regulatory Commission.

Paul H. Lohaus,

Chief Low-Level Waste Management Branch, Division of Low- Level Waste Management and Decommissioning, Office of Nuclear Material Safety and Safeguards.
Copies of the proposed Technical Position may be obtained by writing to W.R. Lahs at Mail Stop 5E-2 OWFN, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Comments on this proposed Technical Position are solicited and should be sent by August 26, 1992, to the Chief, Rules and Directives Review Branch, U.S. Nuclear Regulatory Commission, Washington, DC 20555. A final position will be issued following NRC staff review of the comments received.
Notice of availability.
The Nuclear Regulatory Commission (NRC) is announcing the availability of a proposed revision, in part, of the 1983 Staff Technical Position on Radioactive Waste Classification. The revision is entitled, Proposed ''Technical Position on Concentration Averaging and Encapsulation.'' The Position provides guidance on the interpretation of Secs. 61.55(a)(8) of 10 CFR part 61 as it applies to the classification (e.g., Class A, B, or C waste) of a variety of different types and forms of low-level radioactive waste.

The Technical Position on Radioactive Waste Classification was initially developed in 1983 to provide guidance to low-level radioactive waste generators on four specific topics regarding waste classification: (1) Acceptable Materials Accountability Programs; (2) Determination and Verification of Radionuclide Concentrations and Correlations; (3) Concentration Volumes and Masses; and (4) Reporting on Manifests. Because of the desirability of attempting to achieve consistent waste classification positions among the Commission and Agreement State regulatory authorities, and because of the impact of waste classification positions on other programs (e.g., DOE's program to accept greater-than Class C waste), a need was identified to expand upon, further define, and replace guidance provided on the third of the four topics, ''Concentration Volumes and

Masses.'' This need resulted in the development of a Proposed ''Technical Position on Concentration Averaging and Encapsulation.'' Copies of the proposed ''Technical Position on Concentration Averaging and Encapsulation'' are being distributed (under separate cover) to licensees. Copies are also being distributed (separately) by NRC's Office of State Programs to Agreement States, Non-Agreement States, State Liaison Officers, and others who are on the NRC's Compact Distribution List.
INTERNAL DATA: FR Doc. 92-15323; Filed 6-29-92; 8:45 am; BILLING CODE
7590-01-M

Citation 340

<DIALOG File 669: (c) U.S. Govt Printing Office>

00433821
Title: Low-Level Waste Shipment Manifest Information and Reporting, Vol. 57, No. 77, 57 FR 14500
Date: Tuesday, April 21, 1992
AGENCY: NUCLEAR REGULATORY COMMISSION
DOC TYPE: Proposed Rules
CFR: 10 CFR Parts 20 and 61
NUMBER: RIN 3150-AD33
Comment period expires July 20, 1992. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.
CONTACT: William Lahs, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 504-2569 or Mark Haisfield, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3877.
Send comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. Deliver comments to: One White Flint North, 11555 Rockville Pike, Rockville, Maryland, between 7:45 a.m. and 4:15 p.m. on Federal workdays. Comments received and the regulatory analysis can be examined at: The NRC Public Document Room, 2120 L Street NW (Lower Level), Washington, DC. Copies of the proposed Uniform Low-Level Radioactive Waste Manifest forms and the general instructions can be obtained from the contacts listed below. Proposed rule.
The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations in 10 CFR parts 20 and 61 to improve low-level waste (LLW) manifest information and reporting. The amendments would: (1) Improve the quality and uniformity of information contained in manifests which are required to control transfers of LLW intended for disposal at a land disposal facility

(2) Establish a set of forms to serve as a national Uniform Low-Level Radioactive Waste Manifest, in response to requests by Compacts and States

(3) Require the use of one of these forms as a mandatory shipping paper for LLW transport

(4) Require LLW disposal site operators to electronically store the information contained in the Uniform Manifest documents for each container; and

(5) Require the disposal site operators to report the Uniform Manifest information on a machine-readable medium (e.g., magnetic disks or tapes). The NRC is also requesting input on whether and how to establish a national data base for LLW.

WORD COUNT: 19,848
TEXT:
SUPPLEMENTARY INFORMATION:

I. Background.
Low-Level Waste Shipment and Disposal
Existing Shipment Manifests
Waste Processing and the Amendments Act

II. Need for Regulatory Action.
Proposed Regulatory Action
-Shipment manifest information.
-Uniform manifest.
- Reporting and storage of manifest information.
-Manifest information.
National Computer Data Base of LLW Shipment Manifest Information
-Operation of a National LLW Computer Data Base.
III. Proposed Action.
Part 20 Amendments
-Section 20.2006
-Appendix F to Secs. 20.1001 through 20.2401, Section I.
-Appendix F to Secs. 20.1001 through 20.2401, Section II.
-Appendix F to Secs. 20.1001 through 20.2401, Section III.
Part 61 Amendments

-Section 61.12.
-Section 61.80
-Manifest number.
Compatibility of Agreement State Regulations
Application of Amended Regulations to Existing Disposal Facilities

IV. Environmental Impact: Categorical Exclusion.

V. Paperwork Reduction Act Statement.

VI. Regulatory Analysis.
VII. Regulatory Flexibility Certification.

VIII. Backfit Analysis.

I. Background

Low-Level Waste Shipment and Disposal

Low-Level Radioactive Waste (LLW) may be shipped to a LLW disposal facility in a number of ways. Waste may be shipped directly from a waste generator or may be shipped from a waste collector or processor. The collector is a licensee who typically handles prepackaged waste from hospitals, laboratories, or other licensees who generate only small volumes of waste. A shipment from a collector may have been temporarily stored at the collector's facility and, when eventually transported to a disposal facility, shipped with other containers of waste obtained from several generators.

Waste may be shipped from a waste processor who has received waste from other licensees (generators, collectors, or other processors) and has either repackaged the waste or changed its chemical or physical characteristics. For example, the waste processor may have compacted or incinerated the waste, or segregated contaminated waste from non-contaminated waste. A single container of waste shipped from a waste processor may contain wastes from a number of different generators.

Some waste processors also conduct decontamination activities. In this case, contaminated material is delivered to the facility and, after processing, essentially two ''output streams'' are produced. A product ''stream'' contains material that has been sufficiently decontaminated so it can be reused in some manner. The other ''stream'' contains the waste that is characterized, processed, packaged, and shipped to the disposal facility.

Thus, from its original generation to its final delivery to a disposal facility, LLW may have changed hands more than once. Indeed, recent data indicates that about 25% of all LLW delivered to disposal facilities was handled by collectors and processors. Any step in the waste management chain-temporary storage by a collector, processing, or disposal-may have occurred in a State different from that in which the waste was generated. Companies collecting, processing, or disposing of the waste are licensed either by the Nuclear Regulatory Commission or by an Agreement State. fn 1

fn 1Pursuant to the Atomic Energy Act of 1954, as amended, the Commission has the authority to relinquish part of its regulatory authority to a State, contingent upon making a determination that the State's regulatory program is compatible with the Commission's. Twenty-nine States, under formal agreements with the Commission, have assumed this regulatory responsibility. Negotiations with other States are underway.

Each shipment of LLW is currently accompanied by a multi-page manifest that describes the shipment contents. Manifests are large multi-copy detailed documents containing information required by Commission regulations in 10 CFR part 20, fn 2 Department of Transportation (DOT) regulations in 49 CFR part 172, and State requirements imposed as conditions on disposal facility licensees. fn 2The Commission's LLW manifest and tracking requirements reside in Sec. 20.311 of the part 20 regulations. But on May 21, 1991 (56 FR 23360), the Commission promulgated an amended part 20 that, among numerous other modifications, transferred the LLW manifest and tracking requirements to a new Sec. 20.2006 and a new appendix F to Secs. 20.1001 through 20.2401. The new Sec. 20.2006 and appendix F changed the wording of the manifest and tracking requirements but not their meanings.

Three LLW disposal facilities are currently in operation. The Barnwell, SC disposal facility is operated by Chem-Nuclear Systems, Inc., and the Richland, WA, and Beatty, NV facilities are operated by U.S. Ecology, Inc. (All these facilities dispose of waste using the shallow land burial approach).

Upon receipt of a shipment of LLW at these facilities, operators perform quality control checks on the shipment and the information in the manifest. Portions of the manifest information are transferred into their computer recordkeeping systems. Disposal facility operators have developed computer systems to store and process the voluminous manifest information because each year the operators receive thousands of these shipment manifests.

In the future, there may be many more disposal facilities of various designs. Pursuant to the Low-Level Radioactive Waste Policy Amendments Act of 1985 (Amendments Act), and to the Low-Level Radioactive Waste Policy Act of 1980, States have organized into regional Compacts to site and operate new disposal facilities. The Amendments Act established a series of milestones, penalties, and incentives to ensure that the States will be able to manage waste generated within their Compacts. While new disposal capacity is being developed, the three

sited States (Nevada, South Carolina, and Washington) may impose surcharges on waste from outside their Compacts and allocate waste from nuclear utilities. After December 31, 1992, the Compacts are responsible for managing their own wastes and can prohibit disposal of waste generated from outside their compacts. (The Barnwell, SC, facility is scheduled to close on this date, and a new facility will be sited in the Southeast Compact. The Beatty, NV, facility is scheduled to close in 1993.) The Commission is uncertain how many disposal facilities will be sited pursuant to the Amendments Act. Currently nine Compacts have been formed and each Compact intends to site a disposal facility. In addition, nine States and other entities (Puerto Rico and the District of Columbia) are unaffiliated, i.e., are not members of compacts. Some unaffiliated States plan to site new disposal facilities. Others plan or hope to contract disposal capacity with existing Compacts. If these present plans were all carried to completion, there could be up to 14 disposal facilities.

One of the principal mechanisms by which the NRC staff has been interacting with the Compacts and unaffiliated States is through the Low-Level Radioactive Waste Forum and the Host State Technical Coordinating Committee (TCC). At its regular meeting in March 1990, the TCC passed a motion stating their belief that a uniform manifest is necessary and justifiable for use with all shipments of low-level radioactive waste and requested that the Commission consider its inclusion in this rulemaking action. An example manifest, together with supporting material, was subsequently transmitted to the NRC by the TCC on November 9, 1990. The NRC staff seriously considered the recommendations of the TCC in developing the uniform manifest referred to in this proposed rulemaking. The NRC staff has also consulted with DOT on those parts of the rule and uniform manifest that address DOT shipping paper requirements. Confirmation has been received from DOT that their shipping paper requirements have been addressed in a satisfactory manner. Copies of the Uniform Low-Level Radioactive Waste Manifest forms and the general instructions can be obtained from the contacts previously identified.

Existing Shipment Manifests

The NRC has identified needed improvements in the procedures for reporting information on LLW shipments. The information in existing shipment manifests is inconsistent and does not include detailed information on the types of waste expected to be disposed at LLW disposal facilities. Such information would most efficiently support evaluations of the source term for use in independent performance assessment and the potential needs for other regulatory actions. Moreover, the NRC needs to generate the data base as waste is disposed to avoid situations (pg 14502) where reconstruction of the data is needed well after waste disposal. It is prudent and less burdensome to request and store data in a machine readable medium relatively soon after waste disposal. In this manner, a data base can be developed and maintained for current use, future use, and for potential unanticipated uses without undue burden on licensees.

As part of licensing new LLW disposal facilities, applicants and regulatory agencies will need to assess the expected performance of the disposal facilities. Similar assessments would be performed for disposal facility license renewals and closure. To make these assessments, one must understand the potential mechanisms and rates by which radioactivity can move from the waste and potentially be released into the environment. The chemical, physical, and radiological characteristics of the disposed LLW, the quantity disposed, and the waste retention capabilities of various disposal containers and waste forms must be considered in these assessments. That is, there must be a quantitative source term for performance assessment. A greater understanding of these factors should lead to the use of more realistic assumptions in performance assessment calculations. In this regard, the NRC staff notes that existing LLW manifests
generally contain less information than needed to optimally assess the performance and operations of LLW disposal facilities. For example, existing manifests frequently describe the waste container in only general terms. However, container degradation can be a major consideration in LLW performance assessments. Further, manifests frequently describe the physical and chemical characteristics of waste in vague terms. For example, in 1987, 38% of the volume of all LLW (and 11% of the activity) was described in manifests as a "dry solid." In 1988, this description characterized 13% of the waste volume and 4% of the activity. Vague waste (and disposal container) descriptions make it difficult to predict the possible movement of radioactivity under normal or accident conditions, and may lead to less realistic assumptions about such potential movements.

Finally, existing manifests describe wastes differently. This increases the difficulty of comparing data from different manifests. As new disposal facilities are licensed, this problem can only become worse if needed information requirements are not more specifically defined. Waste Processing and the Amendments Act Tracking the identity of the waste generator and festering the objectives of the Amendments Act as imposed on States and Compacts, become more complicated when the waste forms, dimensions, or packagings are changed by a waste processor. To reduce waste disposal costs, generators increasingly ship LLW to offsite waste processing facilities frequently located in a State different from that of the waste generator. The processed waste, often significantly reduced in volume, is then shipped to a disposal facility. Each container of waste shipped from a waste processor may contain waste from several different generators.

Currently, 10 CFR part 20 requires that waste processors maintain records of LLW delivered to the processing facility, and when shipping the processed waste to a disposal facility, that the processor prepare a new shipment manifest. Although these records are available for inspection by the responsible regulatory agency, there is no requirement in 10 CFR part 20 to include any specific information from the waste generator records with shipments of LLW to disposal facilities. According to the existing 10 CFR part 20 regulations, the processor could be considered the waste generator.

Yet States and Compacts need to identify the generators of low-level waste so as to establish whether the waste has been generated in the State or Compact in which the LLW disposal facility is located. While new disposal

capacity is being developed, the Amendments Act permits the three sited States to impose surcharges on wastes from outside their Compact region and to allocate wastes from utilities. Thus, all three sited States have required that shipment manifests from waste processors identify the waste generators, as well as the quantities of wastes contributed by each generator. In the future, Compacts will have the authority to bar waste from outside the Compact. Therefore, the Compacts must also be able to track waste delivered from processors back to the waste generators. The NRC staff believes this rulemaking will assist States and Compacts in reaching their objectives and will also minimize or prevent the possible creation of ''orphan wastes.''

II. Need for Regulatory Action
The Commission is proposing to amend its regulations to-

(1) Upgrade the quality and uniformity of information contained in manifests required to control and describe shipments of LLW

(2) Establish a set of forms to serve as a national Uniform Law-Level Radioactive Waste Manifest to the NRC, DOT, and State information requirements

(3) Require the use of one of these forms as a mandatory shipping paper for LLW transport

(4) Require electronic storage of shipment manifest information for each container in recordkeeping systems for LLW disposal facilities; and

(5) Require that NRC-licensed disposal facility operators submit reports of manifest information on a machine readable medium (e.g., magnetic disks or tapes).

This proposed action could foster the development of a national computer data base containing complete and uniform data on LLW shipped to disposal facilities. However, these amendments do not create this national LLW data base. The proposed amendments would also amend Commission regulations to be consistent with the waste generator tracking authority provided to Compacts in the Amendments Act. Further, those parts of the proposed Uniform Low-Level Radioactive Waste Manifest that include DOT shipping paper requirements would reflect the proposed regulation (49 CFR part 171 et. al.) published by DOT in the Federal Register on November 14, 1989 (54 FR 47454). For purposes of issuing the proposed rulemaking, confirmation has been received from DOT that shipping paper requirements are satisfactorily addressed by this proposed rule and the proposed uniform manifest (July 19, 1991, letter from Alan Roberts, Associate Administrator for Hazardous Materials Safety to Eric Beckjord, Director, Office of Nuclear Regulatory Research).

Proposed Regulatory Action

The Commission proposes to take the aforementioned regulatory action to enhance the ability of the NRC and State regulatory agencies to control and safely regulate disposal of LLW. The Commission's reasons for taking this regulatory action follow:

Shipment Manifest Information

The NRC staff believes that improvements are needed in the information provided through LLW shipment manifests. Although existing LLW shipment manifests contain considerable information, their descriptions of waste are inconsistent and frequently vague. The existing (pg 14503) shipment manifests generally do not contain the types of information in sufficent detail needed to make more realistic assumptions in conducting performance assessment evaluations, or project other impacts from the LLW during or following disposal operations. Hence in identifying the information to be contained on the Uniform Low- Level Radioactive Waste Manifest, the NRC staff considered the data needs of the Low-Level waste disposal performance assessment models under development which are aimed at providing more realistic LLW performance assessments. Uniform manifest

In the future, up to 14 disposal facilities may be operating. Without uniform information on shipment manifests, LLW is likely to be described in a a number of inconsistent ways. Because the chemical, physical, and radiological properties of LLW directly determine both the expected performance of disposal facilities, as well as actual impacts of LLW disposal during operations and post closure, inconsistent descriptions of emplaced LLW may render realistic assessments of LLW disposal impacts more difficult.

Hence, the Commission is proposing to require use of its uniform manifest (NRC Forms 540, 540A, 541, 541A, 542 and 542A) to assure uniformity of content and detail of LLW shipment manifests. However, the manifest itself will not be made part of the NRC's regulations in order to retain the flexibility to change the manifest to reflect changes in practice without rulemaking. Significant changes to information requirement in the uniform manifest would require a rulemaking action. For most wastes, a container of waste can be adequately described using proposed NRC Forms 540 and 541 (and NRC Forms 540A and 541A, if reguired). The principal purpose of NRC Form 540 (and NRC Form 540A) is to satisfy DOT shipping paper requirements contained in 49 CFR part 172 and the waste tracking requirements contained in 10 CFR part 20. The principal purpose of NRC Form 541 (and NRC Form 541A) would be to obtain the information necessary for disposal operations and for assessing and monitoring disposal of radioactive waste. A final additional form, NRC Form 542 (and NRC Form 542A, if required), would contain waste generator information for LLW shipped from a waste collector or processor. This information would not be much different than that reported under existing practices. By separating the information requirements by purpose and by ''Form,'' the Commission believes that DOT, NNC, and Agreement State requirements can be met

while minimizing the volume of paperwork, and specifically, paperwork required to physically accompany LLW shipments. The Commission's intent is to also provide the manifest in a multi-copy format suitable for use with computer systems. Implementation in this manner should satisfy a wide variety of information distribution needs which may be established by Agreement States or Compacts.

Reporting and Storage of Manifest Information

The Commission proposes to require that manifest information from NRC-licensed disposal facilities be stored and conveyed by a machine readable medium. (The specific content and schedule for these reports will be established as a condition of the license.) The types of reports expected would require the disposal facility operator to be able to track the origin, transport, disposition, and characteristics of individual disposal containers of waste. It will be expected that various groupings of the data would be necessary to address various regulatory needs. For example, disposal facility licensees must perform, and NRC or Agreement State regulatory authorities must review, approve, and be able to independently verify safety and environmental performance assessments for periodic license renewals and eventual facility closure (Sec. 61.27). Because many of these assessments will be similar to those performed when the facility was first licensed, regulators will need a detailed knowledge of the radionuclide inventories of disposed waste as a function of specific waste streams to assure continued safe operation of the facility. At some disposal facilities, maximum inventories of specific radionuclides will be established (Sec. 61.7(b)), and at these facilities, the licensee will need to maintain a running total of the disposed radionuclides. Electronic transmittal of information would also help regulatory agencies assess the significance of possible problems at a disposal facility (e.g., questions about the adequacy of particular disposal containers or solidification media). For the above assessment, it would be expected that parameters such as waste volume, radionuclide inventories, radiation levels, or chelating agent content would be determined as a function of other parameters such as the waste description, the solidification agent, the waste or stability class, the waste generator, or groups of waste generators (e.g., nuclear utilities, hospitals).

Of course, the Commission could require reporting of manifest information without specifying a machine readable medium. In such a case the data from paper copies would have to be transferred manually to an electronic medium. Transcription errors would undoubtedly occur, and costly checks and controls would have to be instituted to minimize these errors. Moreover, the volume of the data along may make such a process impractical. A requirement to submit information on a machine readable medium is consistent with the requirements of the Paperwork Reduction Act of 1980. One of the expressed purposes of this Act is to ensure that automatic data processing, telecommunication, and other information technologies are acquired and used by the Federal government in a manner that improves service delivery and program management, improves the quality of decisionmaking, and reduces the information processing burden for the Federal government and for persons who provide information to the Federal government. The requirement would also be consistent with the regulations of the Office of Management and Budget (OMB). In 5 CFR 1320.6, OMB directs Federal agencies to consider '' reducing the burden on respondents by use of automated collection techniques or other forms of information technology.''

To facilitate transfer of manifest information the Commission is proposing to require that this information also be stored electronically. The potential for errors or inconsistencies between the data in the operator's system and the transmitted data, as well as the delays that would be encountered in non-electronic transfers, would be unacceptable unless electronically transmitted data is also stored electronically.

In addition, under the proposed amendments, the Commission's proposed instructions for completing the Uniform Low-Level Radioactive Waste Manifest would state that the shipper has attached the appropriate Environmental Protection Agency (EPA) manifest (e.g., for any hazardous waste or, possibly medical waste). In practice, this means that shippers would have to provide two manifests for mixed waste or, possibly medical waste containing radioactive material. Thus, on the EPA uniform hazardous waste manifest, for example, the hazardous content of the waste would be identified according to EPA manifest instructions. If necessary, (pg 14504) a container identification number can be included in the shaded area of the EPA uniform hazardous waste manifest to key a waste disposal container back to the specific container described on NRC's Uniform Low-Level Radioactive Waste Manifest.

National Computer Data Base of LLW Shipment Manifest Information

The Commission is interested in public views on the benefits of a national computer LLW data base. As discussed below, the NRC staff envisions a number of possible needs for and uses of a national LLW computer data base. The national computer data base could contain LLW shipment manifest information collected from all operating disposal facilities and could be available to State Compacts and regulatory agencies as well as to the NRC and others that need the data. However, at this time the Commission has not decided on whether it is necessary and prudent to take this next step.

For any specific disposal facility licensed by the NRC, this data base could enhance the NRC's ability to monitor waste disposal at that facility and make suitable comparisons on a national basis. For example, the NRC staff could readily access up-to-date data on the total volumes of disposed waste, the total activities of disposed radionuclides, the waste volumes and activities contributed by specific generators, and other information. It would assist in evaluating a disposal licensee's safety and environmental assessments for periodic license renewal and eventual disposal facility closure. Similar benefits could accrue to Agreement State licensing authorities. Access to the computer data base may replace the need for disposal facility license conditions requiring licensees to report the same information to the NRC and/or the licensing Agreement State.

Furthermore, the NRC staff conducts a number of waste management activities, and has responsibilities, that are independent of the licensing of any specific disposal facility. A national LLW computer data base could help in conducting these activities in a manner which may better assure protection of public health and safety.

For example, a national LLW computer data base could-

1. Improve the NRC's national regulatory oversight program. The NRC's regulatory responsibilities include monitoring the adequacy of LLW disposal regulations, and as needed, developing additional regulations and guidance. The 10 CFR part 61, regulations, promulgated on December 27, 1982 (47 FR 57446), reflected the physical, chemical, and radiological characteristics of LLW at that time. These characteristics are changing, and the NRC needs to ensure that the existing regulations and guidance continue to protect public health and safety. For example, licensees are reducing waste volumes significantly, a trend that tends to increase waste radionuclide concentrations. Changes in technology tend to change waste radionuclide distributions. The increased use of chemical decontamination processes create wastes containing chelating agents that may enhance the movement of radioactivity from disposed waste.

2. Improve the inspection process for determining licensee's compliance with the NRC's requirements for waste characterization and classification, and for safe transportation of radioactive material. Currently, inspections of a licensee's waste classification and shipment programs are conducted by reviewing shipment records and other documents at the licensee's facility. If inspectors had access to a computer data base of shipment manifest information, then inspectors could use programs built into the computer system to quickly review the licensee's shipment records and calculations. Because problems or areas of concern could thus be identified before making the physical inspection, the actual inspection of a licensee's waste classification and shipment program could be conducted more efficiently and in greater detail.

3. Improve the NRC's ability to ensure accountability and control of radioactive material. Provided the computer data base tracked the identities of waste generators through waste processors, it would enhance the ability to independently confirm licensees' statements, pursuant to 10 CFR 30.36 and 31.5, regarding transfer of radioactive material and devices to disposal facilities. The data base would also assist the staff in tracking the disposal of certain wastes of interest such as activated metals and sealed sources.

The NRC staff has discussed the concept of a national LLW data base with representatives of Compact and regulatory agencies, with other Federal agencies, and with disposal facility operators. Many State entities have needs and uses for a national LLW data base that are similar to those of the NRC. For example, Agreement State regulatory agencies must monitor the disposal of LLW into State-licensed disposal facilities, and must inspect the waste management programs of their State licensees. Similar to the NRC, State regulatory agencies must occasionally promulgate regulations that address LLW management and must perform technical studies and analyses. A need has also been expressed to monitor the performance of LLW generators in reducing the generator of waste and in using available technology for this purpose.

Finally, many Compacts and State regulatory agencies have repeatedly called for a national LLW data base to improve the process of siting and licensing new disposal facilities. Compacts could use the data base to help develop projections of LLW to be disposed of in their Compacts. Like the NRC, State regulatory agencies could use the data base to assist them in evaluating the applicants' projections of the radioactive waste source term and in developing independent source terms to confirm these projections.

Operation of a National LLW Computer Data Base

If, after analysis of public comments, the Commission decides to establish a national data base, the next step would be to determine how to collect the data and who should operate the system. One approach on who should operate a national LLW data system would be to build upon the Manifest Information Management System (MIMS), already established by the Department of Energy (DOE) in response to the Amendments Act. However, DOE operates the MIMS system in support of States and Compacts carrying out the site selection and development provisions of the Amendments Act, and DOE has considered eventually passing responsibility for management of the system to the States and Compacts. Other approaches could include operation of the national system by the NRC or by a non-profit organization such as the LLW Forum.

The NRC staff estimates that it would require about$250,000 to acquire access to an appropriate computer and to develop the programming for a national data system, assuming that MIMS is not used as a basis. Costs would be reduced to the extent that MIMS could be used as a starting point. Operation of the system would likely require about$150,000 per year.

The Commission requests public comment on the appropriate entity to operate a national LLW computer data base and other assumptions regarding operation of this data base (i.e., frequency of submitting data) if it is felt this is a prudent next step. {pg 14505}

III. Proposed Action
Part 20 Amendments

Section 20.2206 and appendix F to Secs. 20.1001 through 20.2401 (subsequently referred to as appendix F) address transfer of radioactive waste to a land disposal facility and establishment of a manifest tracking system. Section 20.2006 outlines general requirements and refers to Appendix F for details. Appendix F is divided into

three sections, respectively addressing shipment manifests, certification of manifest contents, and waste control and tracking. The following discussion describes the proposed changes to 10 CFR part 20 and the supporting rationale.

Section 20.2006

The proposed amendment to this section involves a change to paragraph (b) which makes reference to preparation of manifest information as specified in appendix F.

Appendix F, Section 1

The existing section I of appendix F requires that shippers indicate, as completely as practicable, a physical description of the waste, the volume, the radionuclide identity and quantity, the total radioactivity, the principal chemical form, the solidification agent, the quantities of chelating agents, and the waste class. The existing requirements, however, are general and do not specify if the information is to be provided for each container of waste or summed over the entire shipment of waste.

The proposed amendments, in requiring completion of the Uniform Manifest, clarify the need to track waste through waste collectors (see definitions in appendix F of proposed rule) back to a license to whom the waste can be attributed. Although this is the intent of the existing regulations-to ensure that the chain of custody of wastes handled by waste collectors is known-there has been some confusion about this requirement. The proposed amendments, and specifically the proposed Uniform Low-Level Radioactive Waste Manifest, will eliminate this confusion. The proposed amendments clarify that the name, address, and telephone number of waste collectors be provided, as well as the name, address, and telephone number of each generator of waste contributing to the shipment. The manifest must indicate the license to whom a container of waste can be attributed.

For wastes handled by licensed waste processors, as defined in appendix F of the proposed rule, the Commission is proposing requirements based on the procedures currently in place at existing disposal facilities. The proposed section I and the proposed Uniform Low-Level Radioactive Waste Manifest require licensed waste processors to include their name, facility address, and telephone number, as well as the name, facility address, and telephone number of each licensee to whom the waste in the shipment can be attributed. For each container of waste, identification of, and contributions by, the individual generators to the shipment contents would be required, as would be the manifest number(s) under which the waste (or material) was received and the date of receipt. Under current regulations these manifests must be retained until the NRC terminates the license.

The proposed section I, which is divided into five subsections, is much more specific than the existing section I. Subsection A provides general requirements; Subsection B addresses information needed on a shipment basis; Subsection C addresses information to be provided for individual containers of waste; Subsection D applies if waste is delivered to the disposal facility in an uncontainerized form, as could be the case for bulk quantities of waste or for some contaminated components; and Subsection E applies to waste containers enclosing mixtures of the LLW originating from different waste generators.

1. Subsection A. General Information: Under existing regulations, the manifest must contain the name, address, and telephone number of the person generating the waste and the name, address, and telephone number or name and EPA hazardous waste identification number of the person transporting the waste to the land disposal facility. Information contained in shipping papers required by DOT can currently be considered in meeting existing manifest requirements.

In the proposed amendments, these requirements are clarified and expanded to capture the public health and safety information currently required on existing manifests by both Federal and State regulatory authorities. For example, as a matter of clarification, the waste generator ''address'' required in current regulations is changed to ''facility address.'' A number of waste generators generate waste from two or more facilities, such as a nuclear utility that operates two or more nuclear power stations. The clarification is made to ensure that waste can be tracked back to a specific facility.

2. Subsection B. Shipment Information: A number of items of information would be required for each shipment. These include: the date of waste shipment; the total volume and weight of the shipment; the total radioactivity in the shipment, including the activities of each of the radionuclides H-3, C-14, Tc- 99, and I-129; the total number of package/disposal containers; the total mass of uranium and thorium in source material; and the masses of U-233, U-235, and plutonium in special nuclear material. All these items of information are required by existing NRC or DOT regulations or are supplied on existing shipment manifests. This information would continue to be required on NRC Form 540 (and NRC Form 540A) and Form 541 (and NRC Form 541A).

3. Subsection C. Disposal Container Information: This subsection describes disposal container information (and transport packaging, if the disposal container is also the packaging as defined by DOT). The requirements in this subsection are (1) those that are currently contained in 10 CFR part 20 (including clarifications to existing requirements), (2) those that would require reporting manifest data that are currently not explicitly required by 10 CFR part 20, but typically are included in existing manifests, and (3) those that would require additional or better information beyond that currently required or reported on existing manifests. The above requirements are discussed separately. The first set of requirements would result in essentially no reporting changes and are listed below:

1. The volume displaced by the disposal container

2. The classification of the waste pursuant to Sec. 61.55

3. The identities and activities (quantities) of individual radionuclides; and

4. The total radioactivity within the disposal container.

The second set of requirements which would now be specifically included in NRC regulations is listed below, followed by a discussion of each specific item:

1. A unique identification of each disposal container within a waste shipment

2. Identification of waste not meeting the structural stability requirements of Sec. 61.56(b)

3. The gross weight of the waste plus the disposal container

4. The masses of uranium and thorium in source material and the masses of U-233, U-235, and plutonium in special nuclear material; and {pg 14506}

5. The maximum radiation levels at the surface of each disposal container.

Disposal container identification is needed so that a specific container of waste can be matched with a specific physical, chemical, and radiological description on the manifest and ultimately traced to the waste generator. The disposal container identification on the manifest must correspond to that marked on the container.

The structural stability of the waste must be included so that disposal facility operators can ensure that unstable class A waste does not get mixed with stable class B and C waste. Pursuant to Sec. 61.51(a)(1), stable Class B and C wastes must be segregated during disposal from unstable Class A waste. Stable Class A waste, however, may be mixed with the Class B and C wastes. This information requirement is satisfied on the proposed uniform manifest by requiring an input into the ''waste classification'' column on NRC Form 541 (and NRC Form 541A, if required) which defines whether Class A waste meets only minimum requirements (AU) or the additional stability requirements (AS) of Sec. 61.56.

The gross weight of the disposal container is needed for multiple reasons. The gross weight helps to ensure accountability and control of the waste, because it is a basic descriptive element of the shipped material. Further, the gross weight can be used along with a physical description of the container to estimate the mass of the waste within the container. (The waste mass, along with the waste volume, determines waste density, a parameter used in some performance assessment calculations).

Information about the masses of source and special nuclear material delivered to a disposal facility will assist in ensuring compliance with disposal facility license conditions that impose limits on material possession and in filing reports as required by regulations. In addition, the information also is a basic descriptive element of the waste.

Disposal container radiation levels are needed for a variety of reasons. To begin, radiation levels are a basic descriptive element of the shipped material. The information also is needed for demonstration of compliance with DOT regulations. Further, a data base of disposal container radiation levels would assist operators and regulators in performing environmental assessments of waste transportation activities (e.g., container radiation levels dictate the amount of shielding required during waste transportation, which in turn dictates the types of packagings which must be used, and the number of shipments). Container radiation levels are also highly useful in determining waste handling operational procedures to minimize occupational exposures during the chain of activities resulting in eventual disposal. Operational considerations, in turn, influence disposal facility rate structures and other economic factors.

Finally, the proposed amendments of this subsection that would require additional or better information beyond that currently required or reported on existing manifests are:

1. A physical description of the disposal container, including information which would identify a high-integrity container, if utilized

2. A physical and chemical description of the waste

3. Definitive sorption or solidification agent information; and 4. The total weight percentage of all chelating agents in the waste, if contained in concentrations exceeding 0.1 percent by weight, plus the identity of the most prevalent of these agents.

A physical description of the disposal container is a basic descriptive element of the shipped material. Further, a physical description of the disposal containers is used in estimates of the weight of the waste itself, a data element used in performance assessment calculations. Finally, the physical description of the disposal container is a necessary element in assessing the contribution to long-term performance of waste disposal.

The physical description of disposal containers must be sufficiently specific so as to satisfy the uses noted above, but be sufficiently general so as not to be burdensome on those preparing and using the manifest. Hence, vague descriptions such as ''strong tight container,'' as are sometimes found on existing manifests, would not be considered acceptable. Yet, a wide variety of disposal containers are currently being used, and the NRC staff expects that additional containers will be used in the future. The Commission has decided to propose a general requirement in the proposed regulation and to request public comment on a list of container descriptions which it believes satisfies both the above constraints. From comments received, the Commission intends to update the list for use with the Uniform Low-Level Radioactive Waste Manifest. The NRC's list of disposal container descriptions is provided below:

Wooden box or crate
Metal box
Plastic drum or pail
Metal drum or pail
Metal tank or liner
Concrete tank or liner
Polyethylene tank or liner
Fiberglass tank or liner
Demineralizer
Gas cylinder
Bulk, unpackaged waste
Unpackaged components
High Integrity containers
Other (describe as necessary)

It should be noted that certain disposal containers may not be accepted at some disposal facilities.

The above list includes the possibility that the disposal container is a high-integrity container (HIC). A specific requirement to identify the make and model number of any HIC is included because, although HICs are not specifically required by the 10 CFR part 61 regulations, they are commonly used by licensees to meet the structural stability requirements of Sec. 61.56. Further, HICs are commonly designed to contain waste within a disposal environment for a minimum of 300 years, and to meet DOT requirements for a Type A package. Hence, potentially to an even greater extent than ordinary disposal containers, the specifics of HICs are needed for realistic performance assessments.

An understanding of the physical and chemical form of the waste is important for performance and environmental assessments. This is because the release of radioactivity from waste depends on the waste's physical and chemical characteristics. For this reason, existing 10 CFR part 20 regulations require that shipment manifests provide a physical description of the waste as well as the principal chemical form. DOT regulations in 49 CFR 172.203(d)(ii) require ''a description of the physical and chemical form of the material, if the material is not in special form .'' To refrain from burdening waste generators with excessive reporting requirements, the proposed uniform manifest provides space on proposed NRC Forms 540 and 540A for the physical and chemical form required by DOT regulations. The uniform manifest also provides additional space on NRC Forms 541 and 541A for a more detailed description of the waste. An index is proposed for documenting the physical description of the waste in the ''waste descriptor'' column.

This list is provided below:
Charcoal
Incinerator ash
Soil
Sealed source/device
Gas
Oil
Aqueous liquid
Filter media
Cation ion- exchange media
Anion ion-exchange media
Mixed bed ion-exchange media
Contaminated equipment
Evaporator bottom/sludge/concentrate
Glassware or labware
Organic liquid (except oil)
Mechanical filter
Compactible trash
Noncompactible trash
Demolition rubble
Animal carcasses
Biological material (except animal carcass)
Paint or plating
Activated material
EPA hazardous
Other (describe as necessary)

Note that if the waste is absorbed or solidified, this fact would be indicated by specifying a solidification

or sorption agent in the column provided on NRC Forms 541 and 541A.

The Commission specifically requests public comment on this list.

If two or more waste forms are contained in a single disposal container, an acceptable approach would be to list the most prevalent forms of waste by using an appropriate number of index codes which predominate by waste volume. (Current instructions for NRC Form 541 limit this number to three). As noted above, space has been provided on NRC Forms 541 and 541A to expand upon the chemical description of the waste provided on NRC Forms 540 and 540A.

The sorption or solidification agent must be specified to help determine the rates of release of radionuclides from disposed waste. Because leaching of radionuclides from different solidification agents occurs at different rates, the identity of the solidification agent is currently required by 10 CFR part 20. Provision for identification or sorbing or generic solidification medias is provided on NRC Forms 541 and 541A. A listing of these codes is provided below and the Commission requests comments on this list.

Sorption
Speedi Dri
Celetom
Floor Dry/Superfine
Hi Dri
Safe T Sorb
Safe N Dri
Florco
Florco X
Solid A Sorb
Chemsil 30
Chemsil 50
Chemsil 3030
Dicaperl HP200
Dicaperl HP500
Zonolite Gd4
Petroset
Petroset II
Aquaset
Aquaset II
Other (describe as necessary)

Solidification
Cement
Concrete (encapsultation)
Bitumen
Vinyl Toluene
Vinyl Ester Styrene
Other (describe as necessary)

Different vendors use different chemical formulations. If a problem with a solidification agent approved as an acceptable stabilization media was detected, a data base on the most commonly used solidification/stabilization media would help the NRC, State regulatory authorities and disposal facility operators determine the extent of the problem and potential remedial actions.

The NRC staff has considered to what extent information about solidified/stabilized wastes should be included in shipment manifests. There have been suggestions, for example, that the NRC require the reporting of curing time and the waste percent loading. Research by Brookhaven National Laboratory, and others has indicated that leaching from cement waste forms is dependent on these factors. For solidified wastes originating from large-scale decontamination operations, such as those carried out at nuclear reactors to reduce radiation fields around coolant piping, some have suggested requiring information such as the identity of the decontamination process and vendor, or the identity of the decontaminated reactor system. However, the Commission is not at this time proposing to require that all this additional information be included on shipment manifests. To include detailed solidification data on all shipment manifests could significantly increase the size and complexity of the manifests, and the Commission is not convinced that the information would significantly improve performance assessment evaluations.

The Commission believes that a better approach would be to impose additional reporting requirements, if appropriate, only on those solidified wastes that are determined to be of most significance in terms of potential movements of radioactivity within a LLW disposal facility (e.g., shallow land burial facility). Thus, the proposed amendments require (1) reporting of additional information only for solidification/stabilization media used with Class B and C wastes and (2) a quantification of the activity of individual isotopes contained in each unique media.

Regarding chelating agents, the Commission proposes to make a small change in existing regulations. Current regulations require that shippers identify waste containing more than 0.1% chelating agents by weight and

estimate the weight percentage of the chelating agent. But experimental research indicates that the release of radionuclides from wastes containing chelating agents depends on the type of chelating agent. The Commission, therefore, proposes to require that shippers not only estimate the weight percentage of all chelating agents within the disposal container, but to identify the principal chelating agents. The Commission believes that this requirement can be met with little difficulty and the uniform low-level radioactive waste manifest, on NRC Forms 541 and 541A, provides for identification of these agents.

4. Subsection D. Uncontainerized Waste Information: In the great majority of cases, waste will be delivered to disposal facilities in disposal containers. However, this might not be the case with loads of contaminated soil or large components such as a heat exchanger from a nuclear power plant. To avoid confusion, the Commission has modified the requirements proposed for uncontainerized waste to reflect the physical characteristics of this alternative waste form.

5. Subsection E. Multi-Generator Disposal Container Information: This section is included to specify the information to be provided for disposal containers which enclose mixtures of LLW originating from different LLW generators. It would also apply to those unusual situations in which wastes are shipped to the disposal facility in an uncontainerized form, and portions of the uncontainerized wastes are contributed by different generators.

The Commission believes that there are two general cases that must be considered. The first case involves a homogeneous mixture such as incinerator ash. In this case, ash would be considered an essentially uniform waste type, radically different from the waste type originally delivered to the processor. All that is required is to provide the required disposal container and waste description information, and identify the generators and the volume {pg 14508} of the waste contributed by each generator.

The second, more complex, case involves heterogeneous mixtures of waste. An example would be a container filled with a half dozen compressed containers, the products of a high-pressure compactor. In this case, each disposal container may contain more than one waste type. The various waste types, moreover, are largely unchanged from those wastes delivered to the processor's facility, except for obvious differences in waste dimensions and density.

In this case, the proposed requirements contained on NRC Forms 541 and 541A, 542 and 542A serve to track the physical, chemical, and radiological characteristics of the individual compressed containers along with the identities of the waste generator. This is done for two reasons. First, the specified characteristics serve to identify the radioactive material so that its chain of custody can be readily tracked. Second, the specified characteristics are needed so that any potential releases of radioactive material from the waste can be evaluated.

Appendix F, Section II

Section II of appendix F is being amended to clarify that collectors and processors (as well as generators) must certify that the material is properly classified, described, packaged, marked, and labeled to meet DOT and Commission regulations. Since a collector will not have firsthand knowledge of the waste material, a collector would be certifying that nothing has been done to the waste that would negate a generator or processor certification.

Appendix F, Section III

Section III of appendix F contains specific requirements for the control and tracking of low- level waste by generators, collectors, processors, and the land disposal facility. These requirements include packaging, labeling, quality control, shipping and verification, and record retention.

The proposed amendments to this section are those dealing with shipping and verification and the amendments needed to incorporate the NRC Uniform Low-Level Radioactive Waste Manifest.

1. Subsection A: This subsection deals with generators of low-level waste. The subsection is being amended to require the use of NRC's Uniform Low-Level Radioactive Waste Manifest and to allow the generator to forward NRC Forms 541 and 541A ahead of the shipment (electronically, mail, etc.). Manifests may be large cumbersome documents, but only certain information is actually required by DOT to physically accompany the LLW shipment for transportation safety purposes. This information has been incorporated into NRC Form 540. The rest of the information is needed by the processor, collector, disposal site operator, or regulating agency, but would not be needed in the event of a transportation accident. The Commission is therefore allowing generators, in conjunction with the consignee, to develop systems that could reduce the requirements that all manifest information physically accompany LLW shipments. This new optional feature adds flexibility to the control and tracking system and would not affect those facilities who choose to use the existing manifest transfer methods.

2. Subsection B: This subsection deals with waste collectors who handle only prepacked waste. This subsection is being amended to require the use of NRC's Uniform Low-Level Radioactive Waste Manifest, to allow the collector to forward NRC Forms 541 and 541A, and 542 and 542A ahead of the shipment, and to require that the collector notify the generator and the NRC in the event that a waste shipment has not been received within 60 days of the collector's receipt of an advance manifest. These changes parallel those made in subsection A. The requirement to notify the generator and the NRC in the event an advance manifest has been received, but no shipment has arrived, will add additional tracking controls in the event this optional system is used.

3. Subsection C: This subsection deals with waste processors who treat or repackage waste. The changes proposed to this subsection parallel those made to the previous subsections with one additional clarification. Subsection C(2) is being amended to ensure that the identity of the waste generator, the preprocessed waste volume, plus other information, is tracked in manifests from waste processors. For the most part, this clarification continues existing practice.

4. Subsection D: This subsection covers responsibilities of the land disposal facility operator. The changes proposed in this subsection parallel those made in the previous subsections, except that the land disposal facility operator would be required to maintain copies of the manifests and related records in electronic storage.

Part 61 Amendments

In 10 CFR part 61, the licensing requirements for land disposal of radioactive waste, the following amendments are proposed.

Section 61.12

This section discusses specific technical information necessary to demonstrate that performance objectives and applicable technical requirements will be met. The Commission proposes to amend this section to require a description of the electronic recordkeeping system. This is needed so that when reviewing an application for a LLW disposal facility, the NRC, or appropriate Agreement State, will be able to evaluate the adequacy of the applicant's system and procedures for information collection and reporting.

Section 61.80

This section discusses maintenance of records, reports, and transfer of radioactive materials. The Commission proposes to amend this section to specify information to be electronically stored and require NRC licensees to report specified information on a machine readable medium. The information from the Uniform Low-Level Radioactive Waste Manifest (i.e., NRC Forms 540, 540A, 541, 541A, 542 and 542A) that must be electronically stored is that required in 10 CFR part 20, appendix F (discussed earlier) with the exception of shipper and carrier telephone numbers and shipper and consignee certifications. In addition, information must be stored that is not contained on the Uniform Low-Level Radioactive Waste Manifest. This information is to be recorded by the disposal facility operator when the waste is received, inspected, and disposed of. This information addresses the location of the disposed waste within the facility, the dates of waste receipt and disposal, a traceable manifest identification number, a description of any engineered barrier or structural overpack provided for disposal of the waste, and the volumes of any waste materials generated as part of disposal facility operation and disposed of onsite.

The date of disposal and the location of disposed waste must be recorded according to existing NRC regulations and are already stored in recordkeeping systems at existing disposal facilities. The date of waste receipt is needed to help ensure accountability of radioactive material and to assist staff in checking compliance with disposal facility material possession limits. The date of waste receipt, coupled with the shipment date, provides an estimate of the travel time of the waste shipment. {pg 14509} The date waste receipt must be recorded to comply with existing 10 CFR part 20 requirements, and disposal operators routinely record this information. A description of any engineered barrier or structural overpack provided for disposal of the waste is needed to know the volume used in the disposal site and to understand the performance capabilities (i.e., leaching rates) for the entire disposal container/waste system.

Disposal containers shipped to disposal facilities are frequently stacked on pallets or braced with plywood or other materials. Because these materials may contact the waste and are therefore suspected of contamination, the customary practice is to dispose of the materials as radioactive waste. These discarded materials take up space within disposal units, as would any contaminated material generated from recovery of onsite spills, decontamination of onsite buildings or other activities. The volumes of these discarded materials must be recorded and tracked to ensure proper bookeeping and material accountability.

Manifest Number

A traceable manifest number is needed so that information electronically stored can be accessed to, and matched with, the correct shipment and manifest. Operators already store this information in existing disposal facility recordkeeping systems.

The Commission is considering broadening the manifest number's purpose to provide additional useful information. For example, if the NRC were to issue unique identification numbers for all generators, processors, and collectors, the manifest number could include the shipper and consignee identification within the number. This would eliminate some current reporting requirements for organizations and ID numbers. The manifest could also indicate dates and sequential shipments from a shipper to the consignee. The Commission is particularly interested in public comments regarding broadening the manifest number's purpose, what a manifest number should include, and specific ideas on how to implement this concept.

Compatibility of Agreement State Regulations

The Commission is proposing that the Uniform Low-Level Radioactive Waste Manifest be used by all shippers of low-level radioactive waste; that is, by all waste generators, waste collectors, and waste processors licensed by both the Commission and Agreement States. The NRC and Agreement State licensees required to use the proposed manifest, therefore, would also be required to record the minimal information requirements as called for on the applicable uniform manifest forms.

In the development of the three sets of forms comprising the uniform manifest, the NRC staff has coordinated its efforts with staff at DOT and with Agreement and non-Agreement States. Most State representatives have indicated support for a base set of information needs and a uniform manifest. As indicated previously, the development of the Uniform Low-Level Radioactive Waste Manifest has fully considered recommendations made by the TCC. As a result, the Commission believes the information called for on the uniform manifest not only satisfies NRC requirements and DOT shipping paper requirements, but also the majority of requirements of Agreement State regulatory authorities (and land disposal facility operators).

The Commission recognizes that a particular Agreement State may require additional information for their unique regulatory purposes and that disposal site operators may require further information to satisfy operational and administrative considerations. Therefore, this proposed regulation does not prohibit Agreement States or disposal site operators from broadening manifest usage or from imposing additional manifest requirements which may be transmitted as additional pages to the proposed Uniform Low-Level Radioactive Waste Manifest. Serious consideration should be given to the need for specific additional vis-a-vis the advantages in maintaining a ''uniform'' manifesting system. Caution must be taken, however, to ensure that any additional requirements for information are reported in a format which does not conflict with DOT regulations for shipping papers (i.e., 49 CFR part 172).

It should be noted that in the amended Sec. 61.80, the Commission is proposing that its land disposal facility licensees will report stored information to the NRC on a machine readable medium. In an Agreement State, the reporting requirements for a land disposal facility to the Agreement State would be a prerogative of the appropriate Agreement State regulatory authority. The Commission requests public comment on this approach to the Agreement State compatibility issue.

Application of Amended Regulations to Existing Disposal Facilities In applying the amended regulations, the Commission plans to adopt a similar approach to that used when the 10 CFR part 20 manifest and 10 CFR part 61 disposal requirements were originally promulgated on December 27, 1982 (47 FR 57446). At that time, as now, three shallow land burial disposal facilities were operating, all located in Agreement States and all sited before promulgation of the 10 CFR part 61 rule. The 10 CFR part 20 manifest requirements were effective a year following the rule's promulgation for all licensees shipping waste. For the 10 CFR part 61 requirements, the NRC and State regulatory representative established those requirements that would be applied to the existing facilities as license conditions. (At two facilities, site activities were licensed by both the NRC and States.) This ensured that appropriate features of 10 CFR part 61 were implemented while compatible State regulations were being developed.

Similarly, while the 10 CFR part 20 amendments could be effective for all licensees at a suitable time following rule promulgation, the Commission would work out the application of the amended 10 CFR part 61 regulations to the existing disposal facilities in cooperation with the sited States. In so doing, the Commission plans to consider the length of time that the existing disposal facilities will operate after the final rule is promulgated. This approach will ensure that the benefits of improvements to shipping manifests would be fully realized for use by Compacts for licensing new disposal facilities. The benefits of improvements to existing disposal facility recordkeeping systems would only be required if justified in terms of the costs involved and the benefits achieved. The Commission requests public comment on this approach.

IV. Environmental Impact: Categorical Exclusion

The Commission has determined that this proposed regulation is the type of action described in categorical exclusions 10 CFR 51.22(c)(3)(ii) and (iii). Therefore, neither an environmental impact statement nor an environmental assessment has been prepared for this proposed regulation.

V. Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the paperwork requirements.

Public reporting burden for this collection of information is estimated to average 0.9 hours per response, including the time for reviewing (pg 14510) instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The standard shipping manifests required by this rulemaking, NRC Forms 540, 541, and 542, will require 0.65 hours, 1.82 hours, and 0.65 hours respectively to complete these forms. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (MNBB-7714), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-3019 (3150-0014, 3150-0135, and 3150-), Office of Management and Budget, Washington, DC 20503.

VI. Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The draft analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the draft analysis may be obtained from M. Haisfield, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Mail Stop NLS-260.

The Commission requests public comment on the draft regulatory analysis. Comments on the draft analysis may be submitted to the NRC as indicated under the ADDRESSES heading.

VII. Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule, if adopted, will not have a significant economic impact upon a substantial number of small entities. A significant number of hospitals and academic institutions are LLW waste generators, and most of these are non-profit organizations. In 1989, hospitals generated about 2.1% (34,000 ft sup 3) and academic institutions generated about 4.0% (65,000 ft sup 3) of the waste received at commercial disposal facilities. Thus, a substantial number of small entities could be affected by the proposed rule. However, it is unlikely that there would be a significant economic impact.

In 1989, disposal facilities handled 1.6 million ft sup 3 of LLW. With a disposal fee of approximately$60/ft sup 3, annual disposal costs were about$100 million. The estimated cost to industry to implement the proposal amendments is in the range of a savings of$480,000 to a cost of$100,000. Similarly, the estimated annual cost to industry operations is$5,000 to$15,000. These costs are insignificant relative to the annual disposal costs. Because the percentage increases in disposal costs that may be caused by the proposed regulations is substantially less than 1%, the proposed amendments would not have a significant economic impact.

Any small entity subject to this regulation which determines that, because of its size, it is likely to bear a disproportionate adverse economic impact should notify the NRC of this in a comment that indicates the following:

(a) The licensee's size and how the proposed regulation would result in a significant economic burden upon the licensee as compared to the economic burden on a larger licensee.

(b) How the proposed regulations could be modified to take into account the licensee's differing needs or capabilities.

(c) The benefits that would accrue, or the detriments that would be avoided, if the proposed regulations were modified as suggested by the licensee.

(d) How the proposed regulation, as modified, would more closely equalize the impact of regulations or create more equal access to the benefits of Federal programs as opposed to providing special advantages to any individual or group.

(e) How the proposed regulation, as modified, would still adequately protect public health and safety.

VIII. Backfit Analysis

The Commission has determined that the backfit rule, 10 CFR 50.109, does not apply to this proposed rule, because these amendments do not involve any provisions which would impose backfits as defined in 10 CFR 50.109(a)(1). The additional information to be placed on NRC manifest forms will not require nuclear power licensees to change existing procedures used in operation of their facilities. Therefore, a backfit analysis is not required.

List of Subjects

10 CFR Part 20

Byproduct material, Criminal penalty, Licensed material, Nuclear materials, Nuclear power plants and reactors, Occupational safety and health, Packaging and containers, Radiation protection, Reporting and recordkeeping requirements, Special nuclear material, Source material, Waste treatment and disposal.

10 CFR Part 61

Criminal penalty, Low-level waste, Nuclear materials, Reporting and recordkeeping requirements, Waste treatment and disposal.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendment to 10 CFR parts 20 and 61.

PART 20-STANDARDS FOR PROTECTION AGAINST RADIATION

1. The authority citation for part 20 is revised to read as follows:

Authority: Secs. 53, 63, 65, 81, 103, 104, 161, 182, 186, 68 Stat. 930, 933, 935, 936, 937, 948, 953, 955 as amended (42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, 2201, 2232, 2236), secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 20.408 also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241 (42 U.S.C. 10155, 10161).

For the purposes of sec. 233, 68 Stat. 958, as amended (42 U.S.C. 2273); Secs. 20.101, 20.102, 20.103 (a), (b), and (f), 20.104 (a) and (b), 20.105(b), 20.106(a), 20.201, 20.202(a), 20.205, 20.207, 20.301, 20.303, 20.304, 20.305, 20.1102, 20.1201-20.1204, 20.1206, 20.1207, 20.1208, 20.1301, 20.1302, 20.1501, 20.1502, 20.1601 (a) and (d), 20.1602, 20.1603, 20.1701, 20.1704, 20.1801, 20.1802, 20.1901(a), 20.1902, 20.1904, 20.1906, 20.2001, 20.2002, 20.2003, 20.2004, 20.2005 (b) and (c), 20.2006, 20.2101-20.2110, 20.2201-20.2206, and 20.2301 are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); Sec. 20.2106(d) is issued under the Privacy Act of 1974, Pub. L. 93-579, 5 U.S.C. 552a; and Secs. 20.102, 20.103(e), 20.401-20.407, 20.408(b), 20.409, 20.1102(a) (2) and (4), 20.1204(c), 20.1206 (g) and (h), 20.1904(c)(4), 20.1905 (c) and (d), 20.2005(c), 20.2006(b)-(d), 20.2101-20.2103, 20.2104(b)- (d), 20.2105-20.2108, and 20.2201-20.2207 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. Section 20.1009 is revised to read as follows:
Sec. 20.1009 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). The OMB has approved the information collection requirements contained in this part under control number 3150-0014.

(b) The approved information collection requirements contained in this part appear in Secs. 20.1101, 20.1202, 20.1204, 20.1206, 20.1301, 20.1302, 20.1501, 20.1601, 20.1603, 20.1703, 20.1901, 20.1902, 20.1904, 20.1905, 20.1906, 20.2002, 20.2004, 20.2006, 20.2102, 20.2103, 20.2104, 20.2105, 20.2106, 20.2107, 20.2108, 20.2109, 20.2110, 20.2201, 20.2202, 20.2203, 20.2204, 20.2206, and Appendix F to Secs. 20.1001 through 20.2401.

(c) This part contains information collection requirements in addition to those approved under the control number specified in paragraph (a) of this section. These information collection requirements and the control numbers under which they are approved are as follows:

(1) In Sec. 20.2104, NRC Form 4 is approved under control number 3150-.

(2) In Sec. 20.2106 and 20.2206, NRC Form 5 is approved under control number 3150- .

(3) In Sec. 20.2006 and Appendix F to Secs. 20.1001 through 20.2401, NRC Form 540 and 540A is approved under control number 3150- .

(4) In Sec. 20.2006 and Appendix F to Secs. 20.1001 through 20.2401, NRC Form 541 and 541A is approved under control number 3150- .

(5) In Sec. 20.2006 and Appendix F to Secs. 20.1001 through 20.2401, NRC Form 542 and 542A is approved under control number 3150- .

3. Section 20.2006 is amended by revising paragraph (b) to read as follows:
Sec. 20.2006 Transfer for disposal and manifests.

(b) Any licensee shipping low-level radioactive waste intended for ultimate disposal at a licensed land disposal facility must properly document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest and appropriately transfer this recorded manifest information to the intended consignee as specified in appendix F to Secs. 20.1001 through 20.2401 of this part.

4. In Appendix F to Secs. 20.1001 through 20.2401, the heading and section I, section II, and paragraphs A, B, C, and D of section III are revised to read as follows:

Appendix F to Secs. 20.1001 through 20.2401-Requirements for Transfers of Low- Level Radioactive Waste Intended for Disposal at Licensed Land Disposal Facilities and Manifests

I. Manifest

A waste generator, collector, or processor who transports, or offers for transportation low-level radioactive waste intended for ultimate disposal at a licensed low-level radioactive waste facility must prepare a Manifest reflecting information requested on applicable NRC Forms 540 Uniform Low-Level Radioactive Waste Manifest (Shipping Paper) and 541 Uniform Low-Level Radioactive Waste Manifest (Container and Waste Description) and, if necessary, on an applicable NRC Form 542 Uniform Low-Level Radioactive Waste Manifest (Manifest Index and Regional Compact Tabulation) . NRC Forms 540 (and 540A) must be completed and must physically accompany the pertinent low-level waste shipment. Upon agreement between shipper and consignee, NRC Forms 541 (and 541A) and 542 (and 542A) may be completed, transmitted, and stored in electronic media with the capability for producing legible, accurate, and complete records on the respective forms. For guidance in completing these forms, refer

to the instructions that accompany the forms. Copies of manifests required by this appendix may be legible carbon copies, xerox copies, photocopies, or computer printouts that reproduce the data in the format of the uniform manifest.

Single page copies of NRC Forms 540, 540A, 541, 541A, 542 and 542A, and the accompanying instructions, can be obtained from the Information and Records Management Branch, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-8138.

This section includes information requirements of the Commission. Other elements in the uniform manifest are required by the Department of Transportation, as codified in 49 CFR part 172. Information on hazardous, medical, or other waste, required to meet Environmental Protection Agency regulations as codified in 10 CFR parts 259, 261 or elsewhere is not addressed in this section, and must be provided on the required EPA forms. However, such form or forms must accompany the Uniform Low-Level Radioactive Waste Manifest required by this chapter.

As used in this appendix, the following definitions apply:

Chelating agent has the same meaning as that given in Sec. 61.2 of this chapter.

Chemical description means a description of the principal chemical characteristics of low-level radioactive waste.

Decontamination facility is a facility operating under a Commission or Agreement State license whose principal purpose is decontamination of equipment or materials to accomplish recycle, reuse, or other waste management objectives.

Disposal container means a container principally used to confine low-level radioactive waste during disposal operations at a land disposal facility (also see ''high integrity container''). Note that for some shipments, the disposal container may be the transport package.

EPA hazardous waste identification number is an EPA identification number received by a transporter following application to the Administrator of EPA as required by 40 CFR part 263.

Generator is a licensee operating under a Commission or Agreement State license who (1) is a waste generator as defined in this part, or (2) is the licensee to whom waste can be attributed within the context of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (e.g., waste generated as a result of decontamination or recycle activities).

High integrity container (HIC) means a container commonly designed to meet the structural stability requirements of Sec. 61.56 of this chapter, and to meet Department of Transportation requirements for a Type A package.

Land disposal facility has the same meaning as that given in Sec. 61.2 of this chapter.

NRC Forms 540, 540A, 541, 541A, 542, and 542A are official NRC Forms referenced in this appendix. Licensees need not use originals of these NRC Forms as long as any substitute forms are equivalent in all respects (content, size, shading, color, etc.). Upon agreement between the shipper and consignee, NRC Forms 541 (and 541A) and NRC Forms 542 (and 542A) may be completed, transmitted, and stored in electronic media. The electronic media must have the capability for producing legible, accurate, and complete records in the format of the uniform manifest.

Package means the assembly of components necessary to ensure compliance with the packaging requirements of DOT regulations, together with its radioactive contents, as presented for transport.

Physical description means the items called for on NRC Form 541 to describe a low-level radioactive waste.

Residual waste is low-level radioactive waste resulting from processing, decontamination, or recycle activities that cannot be easily separated into distinct batches attributable to specific generators. This waste is attributable to the waste processor, decontamination facility or recycling facility, as applicable.

Shipper means the licensed entity who offers low-level radioactive waste for transportation, typically consigning such waste to a licensed waste collector, waste processor, or land disposal facility operator.

Shipping paper means NRC Form 540 and, if required, NRC Form 540A which includes the information required by DOT in 49 CFR part 172.

Source material has the same meaning as that given in Sec. 40.4 of this chapter.

Special nuclear material has the same meaning as that given in Sec. 70.4 of this chapter.

Uniform Low- Level Radioactive Waste Manifest or uniform manifest means the combination of NRC Forms 540, 541, and, if necessary, 542, and their respective continuation sheets as needed, or equivalent.

Waste collector is an entity, operating under a Commission or Agreement State license, whose principal purpose

is to collect and consolidate waste generated by others, and to transfer this waste, without processing or repackaging the collected waste, to another licensed waste collector, licensed waste processor, or licensed land disposal facility.

Waste description means the physical, chemical and radiological descriptions of a low-level radioactive waste as called for on NRC Form 541. {pg 14512}

Waste generator is a licensee operating under a Commission or Agreement State license, who (1) possesses any material or component, for which no further use by the licensee is foreseen, that contains radioactivity or is radioactively contaminated, and (2) transfers this material or component to a land disposal facility or to a licensed waste collector or processor for handling or treatment prior to disposal.

Note: Unless otherwise defined through regulation or license condition, a licensee providing decontamination services is considered a waste processor, and any low-level radioactive waste resulting from the decontamination process, with the exception of residual waste, must be assigned to the licensee supplying the material or component for decontamination. Used sealed sources or devices transferred to the original source or device manufacturer or other licensee prior to disposal at a land disposal facility must be attributed to the last user of the source or device.

Waste processor is an entity, operating under a Commission or Agreement State license, whose principal purpose is to process, repackage, or otherwise treat low-level radioactive material or waste generated by others prior to eventual transfer of waste to a licensed low-level radioactive waste land disposal facility. Waste type means a waste within a disposal container having a unique physical description (i.e., a specific waste descriptor code or description; or a waste sorbed on or solidified in a specifically defined media).

A. General Information. The shipper of the radioactive waste, shall provide the following information on the uniform manifest:

1. The name, facility address, and telephone number of the licensee shipping the waste

2. An explicit declaration indicating whether the shipper is acting as a generator, collector, processor, or a combination of these identifier for purposes of the manifested shipment; and

3. The name, address, and telephone number, or the name and EPA hazardous waste identification number of the carrier transporting the waste.

B. Shipment Information. The shipper of the radioactive waste shall provide the following information regarding the waste shipment on the uniform manifest:

1. The date of the waste shipment

2. The total number of package/disposal containers

3. The total disposal volume and disposal weight in the shipment

4. The total radionuclide activity in the shipment

5. The activity of each of the radionuclides H-3, C-14, Tc-99, and I-129 contained in the shipment; and

6. The total masses of U-233, U- 235, and plutonium in special nuclear material, and the total mass of uranium and thorium in source material.

C. Disposal Container Information. The shipper of the waste shall provide the following information on the uniform manifest regarding each disposal container of waste in the shipment:

1. An alphabetic or numeric identification that uniquely identifies each disposal container in the shipment

2. A physical description of the disposal container, including the manufacturer and model of any high integrity container

3. The volume displaced by the disposal container and the approximate volume of waste within the disposal container

4. The gross weight of the disposal container

5. A physical and chemical description of the waste

6. The total weight percentage of chelating agent for any disposal container containing more than 0.1% chelating agent by weight, plus the identity of the principal chelating agent 7. The classification of the waste pursuant to Sec. 61.55 of this chapter; waste not meeting the structural stability requirements of Sec. 61.56(b) of this

chapter must be identified

8. The sorbing or solidification media, if any; and the identity of the solidification media vendor and brand name, if the media is claimed to meet stability requirements in 10 CFR 61.56(b)

9. The identities and activities of individual radionuclides contained in each disposal container, the masses of U- 233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material. For Class B and C waste the identities and activities of individual radionuclides contained in specific waste types within a disposal container shall be reported; and

10. The total radioactivity within each container and the maximum radiation level and contamination at the surface of each disposal container.

D. Uncontainerized Waste Information. For waste delivered without a disposal container, provide the following information:

1. The weight of the waste

2. A physical and chemical description of the waste

3. The total weight percentage of chelating agent if the chelating agent exceeds 0.1% by weight; plus the identity of the principal chelating agent

4. The classification of the waste pursuant to Sec. 61.55 of this chapter; waste not meeting the structural stability requirements of Sec. 61.56(b) of this chapter must be identified

5. The identities and activities of individual radionuclides contained in the waste, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material; and 6. The maximum radiation levels at the surface of the waste.

E. Multi- Generator Disposal Container Information. This section applies to disposal containers enclosing mixtures of waste originating from different generators. (Note distinction between ''waste generator'' and ''generator'' in definitions applicable to this Part). It also applies to mixtures of wastes shipped in an uncontainerized form, for which portions of the mixture within the shipment originate from different generators.

1. For homogeneous mixtures of waste, such as incinerator ash, provide the waste description applicable to the mixture and the volume of the waste mass attributed to each generator.

2. For heterogeneous mixtures of waste, such as the combined products from a large compactor, identify each generator contributing waste to the disposal container (and, for Class B and C waste, to each waste type within the disposal container. For each generator, provide the following:

(a) The volume of waste within the disposal container

(b) A physical and chemical description of the waste, including the solidification agent, if any

(c) The total weight percentage of chelating agents for any disposal container containing more than 0.1% chelating agent by weight, plus the identify of the principal chelating agent

(d) The sorbing or solidification media, if any; and the identity of the solidification media vendor and brand name, if the media is claimed to meet stability requirements in 10 CFR 61.56(b); and

(e) Radionuclide identities and activities contained in the waste, the masses of U- 233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material if contained in the waste.

II. Certification

An authorized representative of the waste generator, processor, or collector shall certify by signing and dating the shipment manifest that the transported materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the Commission. A collector in signing the certification is certifying that nothing has been done to the collected waste which would invalidate the waste generator's certification.

III. Control and Tracking

A. Any licensee who transfers radioactive waste to a land disposal facility or a licensed waste collector shall comply with the requirements in paragraphs A.1 through 9 of this section. Any licensee who transfers waste to a licensed waste processor for waste treatment or repackaging shall comply with the requirements of paragraphs A.4 through 9 of this section. A licensee shall:

1. Prepare all wastes so that the waste is classified according to Sec. 61.55 and meets the waste characteristic

requirements in Sec. 61.56 of this chapter

2. Label each disposal container of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with Sec. 61.55 of this chapter

3. Conduct a quality assurance program to assure compliance with Secs. 61.55 and 61.56 of this chapter (the program must include management evaluation of audits)

4. Prepare the NRC Uniform Low-Level Radioactive Waste Manifest as required by this appendix

5. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either (i) receipt of the manifest precedes the LLW shipment or (ii) the manifest is delivered to the consignee with the waste at {pg 14513} the time the waste is transferred to the consignee. Using both (i) and (ii) is also acceptable

6. Include NRC Form 540 (and NRC Form 540A, if required) with the shipment regardless of the option chosen in paragraph A.5 of this section

7. Receive acknowledgement of the receipt of the shipment in the form of a signed copy of NRC Form 540

8. Retain a copy of or electronically store the Uniform Low- Level Radioactive Waste Manifest and documentation of acknowledgement of receipt as the record of transfer of licensed material as required by Parts 30, 40, and 70 of this chapter; and,

9. For any shipments or any part of a shipment for which acknowledgement of receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix.

B. Any waste collector licensee who handles only prepackaged waste shall:
1. Acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of NRC Form 540

2. Prepare a new manifest to reflect consolidated shipments that meet the requirements of this appendix. The waste collector shall ensure that, for each container of waste in the shipment, the manifest identifies the generator of that container of waste

3. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either (i) receipt of the manifest precedes the LLW shipment or (ii) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both (i) and (ii) is also acceptable

4. Include NRC Form 540 (and NRC Form 540A, if required) with the shipment regardless of the option chosen in paragraph B.3 of this section

5. Receive acknowledgement of the receipt of the shipment in the form of a signed copy of NRC Form 540

6. Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgement of receipt as the record of transfer of licensed material as required by parts 30, 40, and 70 of this chapter

7. For any shipments or any part of a shipment for which acknowledgement of receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix; and

8. Notify the shipper and the Administrator of the nearest Commission Regional Office listed in appendix D of this part when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

C. Any licensed waste processor who treats or repackages waste shall:

1. Acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of NRC Form 540

2. Prepare a new manifest that meets the requirements of this appendix. Preparation of the new manifest reflects that the processor is responsible for meeting these requirements. For each container of waste in the shipment, the manifest shall identify the licensee to whom the waste is attributed, the preprocessed waste volume, and the other information as required in section I, subsection E, of this appendix

3. Prepare all wastes so that the waste is classified according to Sec. 61.55 of this chapter and meets the waste characteristics requirements in Sec. 61.56 of this chapter

4. Label each disposal container of waste to identify whether it is Class A waste, Class B waste, or Class C

waste, in accordance with Secs. 61.55 and 61.57 of this chapter

5. Conduct a quality assurance program to assure compliance with Secs. 61.55 and 61.56 of this chapter (the program shall include management evaluation of audits)

6. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either (i) receipt of the manifest precedes the LLW shipment or (ii) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both (i) and (ii) is also acceptable

7. Include NRC Form 540 (and NRC Form 540A, if required) with the shipment regardless of the option chosen in paragraph C.6 of this section

8. Receive acknowledgement of the receipt of the shipment in the form of a signed copy of NRC Form 540

9. Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgement of receipt as the record of transfer of licensed material as required by Parts 30, 40, and 70 of this chapter

10. For any shipment or any part of a shipment for which acknowledgement of a receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix; and

11. Notify the shipper and the Administrator of the nearest Commission Regional Office listed in Appendix D of this part when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

D. The land disposal facility operator shall:

1. Acknowledge receipt of the waste within one week of receipt by returning, as a minimum, a signed copy of NRC Form 540 to the shipper. The shipper to be notified is the licensee who last possessed the waste and transferred the waste to the operator. If any discrepancy exists between materials listed on the Uniform Low- Level Radioactive Waste Manifest and materials received, copies or electronic transfer of the affected forms must be returned indicating the discrepancy

2. Maintain copies of and electronically store all completed manifests until the Commission terminates the license; and

3. Notify the shipper and the Administrator of the nearest Commission Regional Office listed in Appendix D of this part when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

PART 61-LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

5. The authority citation for part 61 continues as follows:

Authority: Secs. 53, 57, 62, 63, 65, 81, 161, 182, 183, 68 Stat. 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2073, 2077, 2092, 2093, 2095, 2111, 2201, 2232, 2233); secs. 202, 206, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846); secs. 10 and 14, Pub. L. 95-601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); Tables 1 and 2, Secs. 61.3, 61.9(f), 61.24, 61.25, 61.27(a), 61.41 through 61.43, 61.52, 61.53, 61.55, 61.56, and 61.61 through 61.63 are issued under sec. 161b, 161i, and 161o, 68 Stat. 948, 949, and 950 as amended (42 U.S.C. 2201(b), 2201(i), and 2201(o)); Secs. 61.9a, 61.10 through 61.16, 61.24, and 61.80 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

6. Section 61.12 is amended by adding paragraph (n) to read as follows: Sec. 61.12 Specific technical information.

(n) A description of the facility electronic recordkeeping system as required in Sec. 61.80.

7. Section 61.80 is amended by revising paragraphs (f), and (i)(1), and adding paragraph (1) to read as follows:

Sec. 61.80 Maintenance of records, reports, and transfers.

(f) Following receipt and acceptance of a shipment of radioactive waste, the licensee shall record the date that the shipment is received at the disposal facility, the date of disposal of the waste, a traceable shipment manifest number, a description of any engineered barrier or structural overpack provided for disposal of the waste, the location of disposal at the disposal site, the containment integrity of the waste disposal containers as received, any discrepancies between materials listed on the manifest and those received, the volume of any pallet, bracing, or other materials that are included with waste shipments, or are generated from onsite activities, and are disposed of as contaminated or suspect materials, and any evidence of leaking or damaged

disposal containers or radiation or contamination levels in excess of limits specified in Department of Transportation and Commission regulations. The licensee shall briefly describe any repackaging operations of any of the disposal containers included in the shipment, plus any other information required by the Commission as a license condition. The licensee shall retain these records until the Commission transfers or terminates the license that authorizes the activities described in this section.

(i)(1) Each licensee authorized to dispose of waste materials received from other persons, pursuant to this part, shall submit annual reports to the appropriate Commission regional office shown in appendix D to Secs. 20.1001 through 20.2401 of this chapter, with copies to the Director, Division of Low-Level Waste Management and Decommissioning, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC, 20555. Reports must be submitted by the end of the first calendar quarter of each year for the preceding year.

(l) In addition to the other requirements of this section, the licensee shall store, or have stored, manifest and other information pertaining to receipt and disposal of radioactive waste in an electronic recordkeeping system. The manifest information that must be electronically stored is (1) that required in 10 CFR part 20, appendix F to Secs. 20.1001 through 20.2401, with the exception of shipper and carrier telephone numbers and shipper and consignee certifications and (2) that information required in paragraph (f) of this section. As specified in facility license conditions, the licensee shall report the stored information, or subsets of this information, on a machine readable medium.

Dated at Rockville, Maryland this 14th day of April, 1992.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.
INTERNAL DATA: FR Doc. 92-9106; Filed 4-20-92; 8:45 am; BILLING CODE
7590-01-M

Citation 341

<DIALOG File 16: (Copr. 1993 Predicasts)>
02449180 DIALOG FILE 16: PTS PROMT
Title: Chemical Waste Magmt - Nuclear Waste Transport & Disposal
S1 SEC Registration April 20, 1989 p. N/A

Abstract: Most low-level radioactive waste is transported by truck to burial sites. In order to meet the special needs of its customers, Chem-Nuclear develops transportation plans ranging from per trip service to dedication of equipment. Chem-Nuclear's transportation fleet consists of approximately 23 tractors and 90 heavy-duty trailers, including specialty trailers such as shielded vans, drop decks and lowboys. Transportation terminals are located in South Carolina and Illinois.
Low-level radioactive waste requiring additional shielding must be transported in shipping casks licensed by the U.S. Nuclear Regulatory Commission. Chem-Nuclear owns 70 of such casks, as well as variety of other containers designed to meet the varying needs of the nuclear industry. Chem-Nuclear's Barnwell, South Carolina facility is one of three licensed commercial low-level radioactive waste disposal facilities in the United States, and has been in operation since 1971. While a substantial portion of the Barnwell facility is believed to be available for future disposal operations, volume reduction measures instituted by generators, as will as certain volume restrictions under which the facility operates, limit its growth opportunities. Waste accepted for burial at the Barnwell facility is palced in specially engineered disposal cells of various sizes, depending upon the waste classification, excavated in clay-rich soils. Waste, which must be in approved containers, is placed in the trench, backfilled and covered with compacted clay-rich cap material followed by topsoil. Thereafter, systematic environmental monitoring is conducted in accordance with state and federal licensing requirements. Fees for burial are set by Chem-Nuclear based upon volume, level of radioactivity and handling considerations. A trust has been established and founded to pay the estimated cost of decommissioning the Barnwell facility. A second fund, for the extended care of the facility, is funded by a surcharge on each cubic foot of waste received. In the event the extra carges collected to restore and maintain the facility are insufficient to cover the costs of restoring or maintaining the site after its closure, the Company may be liable for the extra costs. Through an annual license fee, the State of Soouth Carolina recovers direct and indirect costs it incurs as a result of state monitoring of facility operations.

THIS IS AN EXCERPT: FOR FULL TEXT CONTACT SECEXPRESS BECHTEL INFORMATION
SERVICES, INC.. PHONE (800) 231-3282. OUTSIDE THE UNITED STATES PHONE (301)
738-1400.

COMPANY:
*Chemical Waste Mgmt
Chem-Nuclear Systems DUNS: 05-549-0932

PRODUCT: *Trucking of Hazardous Waste (4213910); Hazardous Waste

Treatmnt,Storge,Disposl (4953700)
EVENT: *Parent-to-Subsidiary Data (14); Facilities & Equipment (44)
COUNTRY: *United States (1USA); South Carolina (1345)

Citation 342

<DIALOG File 545: (COPR. 1992 THOMSON FINANCIAL NETWORKS, INC)>
02101557
Chemical Waste Management - Company Report
WILLIAM BLAIR & COMPANY
Eastman, R.
ILLINOIS

DATE: September 30, 91
INVESTEXT(tm) REPORT NUMBER: 1141960, PAGE 30 OF 45, TEXT PAGE
This is a(n) COMPANY report.

SECTION HEADINGS:
Appendix II - Corporate Overview: Network Of Facilities
Appendix II - Corporate Overview: Market Share
TEXT:

No other competitor has a land disposal based treatment network as large as Chemical Waste Management. Of the company's competitors, Laidlaw has three landfills, and two others have two sites each (excluding Rollins Environmental where capacity is constrained), while the remaining industry participants have only one site each (see Table I). However, the value of the network lies in its integrated treatment capabilities and the leverage that the company realizes from its sites. CHW can offer thermal treatment, stabilization, neutralization, separation, and other treatment options, along with deep well or land disposal. As RCRA has effectively segregated hazardous waste into different waste classifications and codes, and has promulgated specific treatment standards for each, the ability to offer diverse treatment options has been one of CHW's strengths. The company also is able to effectively leverage its land disposal sites through its participation in the remediation market. Contaminated soil should continue to be a large source of future disposal volumes.
Market Share

Chemical Waste Management's efforts have led to leadership positions in a number of its markets. In terms of land disposal, CHW has approximately 35% of the industry landfills, however, in 1990 we estimate that CHW's sites handled closer to 55% of industry disposal volumes. Although it trails Rollins Environmental Inc., CHW has nearly a 25% share of the commercial incineration market. The company also is the leader in the remediation market with roughly a 15% share, and is the largest asbestos abatement and scaffolding company in North America through its ownership of The Brand Companies.

Chemical Waste Management owns a large portion of the hazardous waste landfill capacity that exists in the United States. There are currently approximately 160 hazardous waste landfills. About twenty of these are commercial facilities, of which Chemical Waste Management owns and operates seven (the eighth landfill on the previous chart is dedicated to low-level radioactive waste). Only one new hazardous waste landfill has been sited, permitted, and constructed since 1984. The company estimates that its landfill facilities have an average life expectancy of 20-30 years per site, with successful permit modifications. Recently, volume levels into specific CHW sites have been constrained, not by facility limitations, but rather due to state attempts to restrict waste importation, as well as by lower disposal volumes of special projects waste. CHW's landfills are not only the key revenue contributor, but have evolved into an important complement to its other services.

CHW also is a significant participant in the hazardous waste incineration market. The company has three facilities which now offer incineration services. CHW's three facilities have about a 25% market share. CHW has strategic plans to add to its incineration capabilities at two facilities in California and New York, and longer-term at three other sites (for details on the capacity additions, see segment analysis). With planned additions, we expect CHW to continue to operate approximately 25% of the U.S. commercial incineration capacity.

Company: *CHEMICAL WASTE MANAGEMENT; BRAND COMPANIES (THE)
Ticker Symbol: *CHW; BRAN
Headquarter Geographic Area: ILLINOIS; MIDWEST; MIDWESTERN STATES; UNITED STATES OF AMERICA; NORTH AMERICA; ILLINOIS; MIDWEST; MIDWESTERN STATES UNITED STATES OF AMERICA; NORTH AMERICA
Geographic Codes: IL; MWUSA; USA; NORA; IL; MWUSA; USA; NORA

Industry Cross Reference: WSTMGT
SIC Codes: 4953

Subject Descriptors: *competition; *government relations/regulations
*MARKET SHARE; *PLANTS, PROPERTY, AND EQUIPMENT

Product Descriptors: hazardous waste treatment, storage, disposal

Product Codes: HAZWST

Corporate Source Type: REGIONAL BROKER (Regional investment bank/broker)

Citation 343

<DIALOG File 545: (COPR. 1992 THOMSON FINANCIAL NETWORKS, INC)>
02101551
Chemical Waste Management - Company Report
WILLIAM BLAIR & COMPANY
Eastman, R.
ILLINOIS

DATE: September 30, 91
INVESTEXT(tm) REPORT NUMBER: 1141960, PAGE 36 OF 45, TEXT PAGE
This is a(n) COMPANY report.

SECTION HEADINGS:
App. II - Overview: Treatment/Resource Recovery/Disposal

TEXT:

CHW also has two transportable rotary kiln incinerators: one located in Mexico which services PEMEX, the Mexican national oil company, and the other dedicated to on-site incineration projects. In addition, CHW has strategic plans to add incineration capability at other sites, namely Kettleman Hills, California; Model City, New York and longer term at Memphis, Tennessee; Emelle, Alabama; and possibly in the Pacific Northwest. Closest on the time line is a moderately sized unit, perhaps 25,000 tons per year, at the Kettleman Hills, California, facility. The permit for this unit has received preliminary county approval and is now at the state level. There is legal opposition to the unit, and the timetable for possible completion of the unit will be dictated by the courts and various regulatory agencies. A startup in late 1992 may be possible. Other potential sites for smaller units include Model City, New York, which may be operable in late 1993, with additional possible sites further in the future.

Disposal
Chemical Waste Management is a landfill-driven business. Landfill disposal, we estimate, may have contributed 35-45% of 1990 total revenues, excluding The Brand Companies Inc. contribution. This also excludes the revenues received through the special services segment for disposal of remedial waste. CHW uses its landfills synergistically -- for basic disposal, as a final stop for treatment residue, and to dispose of off-site contaminants from remedial projects. CHW has seven hazardous waste landfills, with one additional site at Barnwell, South Carolina, exclusively for low-level radioactive waste disposal. These landfills at a minimum are clay lined, with newer cells having been lined with double synthetic liners, leachate collection systems, and monitoring wells.

The landfill business as a stand-alone business is mature. Capacity, although scarce in some regions, remains adequately available nationwide. RCRA has created the need for landfill operators to diversify their services and to have the ability to offer treatment options. The days of the independent landfill operator without treatment capabilities are numbered. By offering treatment as well as final disposal, CHW has an improved ability to control its prices. Independents who have only limited treatment capacities have lost volumes to specialty treatment companies or larger firms like CHW which can handle any variety of waste classification.

Longer term, we expect growth in disposal to come from a wider breadth of waste being regulated and from increasing disposal needs generated by remediation projects. These two sources of growth will be important as waste minimization efforts by generators continue to offset disposal volumes industry-wide. In the period from 1984-1987, the fundamentals of reduced landfill capacity industry-wide and the escalating cost of compliance led to sharply higher disposal costs, i.e., a strong pricing environment. We would expect disposal pricing to continue to rise, although future increases probably will mirror inflation rates.

Company: *CHEMICAL WASTE MANAGEMENT
Ticker Symbol: *CHW
Headquarter Geographic Area: ILLINOIS; MIDWEST; MIDWESTERN STATES; UNITED STATES OF AMERICA; NORTH AMERICA
Geographic Codes: IL; MWUSA; USA; NORA

Industry Cross Reference: WSTMGT
SIC Codes: 4953

Subject Descriptors: *business segment reporting; *plants, property, and EQUIPMENT; *GOVERNMENT RELATIONS/REGULATIONS; *OUTLOOK

Product Descriptors: hazardous waste treatment, storage, disposal

Product Codes: HAZWST

Corporate Source Type: REGIONAL BROKER (Regional investment bank/broker)

Citation 344

<DIALOG File 624: (Corp. 1993 McGraw-Hill)>
0210757 DIALOG File 624: McGraw-Hill Publications Online
Title: 'Land ban' rules have industry dazed
Journal: Engineering News-Record April 26, 1990; Pg 47; 118Vol. 224, No. 17
Journal Code: ENR ISSN: 0013-807X
Section Heading: Environmental Update: Landfills
Word Count: 1,419

BYLINE:
Debra K. Rubin in New York and Paul Kemezis in Tullahoma, Tenn.

Citation 345

<DIALOG File 624: (Corp. 1993 McGraw-Hill)>
0201462 DIALOG File 624: McGraw-Hill Publications Online
Title: NEBRASKA, NEW YORK LAWSUITS ARE FIRST BIG CHALLENGES TO LLW ACT
Journal: Nucleonics Week March 8, 1990; Pg 3; Vol. 31, No. 10
Journal Code: NUC ISSN: 0048-105X
Word Count: 708

BYLINE:
Paul Kemezis, Tullahoma, Tenn.

Citation 346

<DIALOG File 669: (c) U.S. Govt Printing Office>
0065502
Title: Staff Assessment of Proposed Amended Agreement Between the Nuclear Regulatory Commission, Vol. 54, No. 233, Wednesday, December 6, 1989
AGENCY: NUCLEAR REGULATORY COMMISSION; U.S. Nuclear Regulatory Commission.
DOC TYPE: Notices
Comments must be received on or before December 15, 1989.
CONTACT: Vandy L. Miller, State, Local and Indian Tribe Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone: 301-492-0326.

Submit comments to: the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555. ATTN: Docketing and Services Branch. Comments may also be delivered to 11555 Rockville Pike, Rockville, Maryland from 7:45 a.m. to 4:15 p.m. Monday through Friday. Copies of comments received by NRC may be examined at the NRC Public Document Room, 2120 L Street, NW., Washington, DC. Notice of Proposed Amended Agreement with State of Utah. Notice is hereby given that the U.S. Nuclear Regulatory Commission (NRC) is publishing for public comment the NRC staff assessment of a proposed amended agreement received from the Governor of the State of Utah for the assumption of certain of the Commission's regulatory authority pursuant to section 274 of the Atomic Energy Act of 1954, as amended. Comments are requested on the public health and safety aspects of the proposal.

A staff assessment of the State's proposed amended program of control over sources of radiation is set forth below as supplementary information to this notice. A copy of the proposed amended agreement, program narrative, including the referenced appendices, applicable State legislation and Utah regulations, is available for public inspection in the Commission's public document room at 2120 L Street, NW, Washington, DC. Exemptions from the Commission's regulatory authority, which would implement this proposed amended agreement, have been published in the Federal Register and codified as part 150 of the Commission's regulations in Title 10 of the Code of Federal Regulations.

WORD COUNT: 5696
TEXT:
Assessment of proposed amended Utah Program to regulate certain radioactive materials pursuant to section 274 of the Atomic Energy Act of 1954, as amended.

The Commission has received a proposal from the Governor of Utah for the State to amend its agreement with the NRC whereby the NRC would relinquish and the State would assume regulatory authority for land disposal of source, byproduct and special nuclear material received from other persons pursuant to section 274 of the Atomic Energy Act of 1954, as amended.

Section 274e of the Atomic Energy Act of 1954, as amended, requires that the terms of the proposed agreement

be published for public comment once each week for four consecutive weeks. Accordingly, this notice will be published four times in the Federal Register.

1. Background

A. Section 274 of the Atomic Energy Act of 1954, as amended, provides a mechanism whereby the NRC may transfer to the States certain regulatory authority over agreement materials fn 1 when a State desires to assume this authority and the Governor certifies that the State has an adequate regulatory program, and when the Commission finds that the State's program is compatible with that of the NRC and is adequate to protect the public health and safety. Section 274g directs the Commission to cooperate with the States in the formulation of standards for protection against radiation hazards to assure that State and Commission programs for radiation protection will be coordinated and compatible. Further, section 274j provides that the Commission shall periodically review such agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this section.

fn 1 A. Byproduct materials as defined in 11e.(1)

B. Byproduct materials as defined in 11e.(2)

C. Source materials; and

D. Special nuclear materials in quantities not sufficient to form a critical mass

B. On March 29, 1984, the Governor of Utah signed an agreement with the NRC for the assumption of regulatory authority for byproduct material as defined in section 11e.(1) of the Act, source material and special nuclear material in quantities not sufficient to form a critical mass. In a letter dated July 17, 1989, Governor Norman H. Bangerter of the State of Utah requested that the Commission enter into an amended agreement with the State pursuant to section 274 of the Atomic Energy Act of 1954, as amended, under which the State would also assume responsibility for regulating the land disposal of these materials received from other persons. The Governor certified that the State of Utah has a program for control of radiation hazards which is adequate to protect the public health and safety with respect to the materials within the State covered by the proposed amendment to the agreement, and that the State of Utah desires to assume regulatory responsibility for such materials. The text of the proposed agreement is shown in Appendix A.

The specific authority requested is for permanent disposal of low-level waste containing the material for which Utah has assumed regulatory authority under the 1984 agreement but not containing uranium and thorium mill tailings (byproduct material as defined in section 11e.(2) of the Act). The State does not wish to assume authority over uranium recovery activities. The State, however, reserves the right to apply at a future date to NRC for an amended agreement to assume authority in this area. The proposed amendment to the agreement covers the following areas:

1. Amending Article I of the Agreement of March 29, 1984 to add land disposal of source, byproduct and special nuclear material received from other persons to the list of materials covered by the agreement.

2. Amending Article II of the Agreement of March 29, 1984 to delete land disposal of source, byproduct and special nuclear material received from other persons from the list of materials and activities over which the Commission continues to retain regulatory authority and responsibility.

3. Specifies the effective date of the amended agreement.

C. Utah Code Annotated (UCA) 26-1-27 through 26-1-29 authorizes the State Department of Health to issue licenses to, and perform inspections of (see, also, UCA 26-23-8), users of radioactive materials under the 1984 agreement and otherwise carry out a total radiation control program. Utah Radiation Control Rules UCA-10 through UCA-80 adopted November 8, 1982 under authority of 26-1-27 through 26-1-29 Utah Code Annotated 1953, as amended, provide standards, licensing, inspection, enforcement and administrative procedures for agreement and non-agreement materials. These regulations have been determined to be compatible with the Commission's regulations. Utah Radiation Control Rules R447-10 through R447-70 were amended and recodified in July 1989. Regulations R447-25 were adopted in July 1988 for licensing requirements for land disposal of radioactive waste.

D. On March 29, 1984, under enabling legislation in UCA 26-1-29, Utah assumed regulatory authority for byproduct material as defined in section 11e.(1) of the Act, source material and special nuclear material in quantities not sufficient to form a critical mass. The program audits conducted since that time have resulted in an NRC finding that the Utah radiation control program is compatible with that of the NRC and is adequate to protect public health and safety. In addition to Utah's agreement program, Utah is involved in several environmental radiation issues including monitoring indoor radon, monitoring uranium mill tailings, particularly at the Vitro uranium mill, and monitoring and assessment of the State environmental program. In addition, the Department issued to Envirocare of Utah, Inc., a license to receive, store, and dispose, by shallow land burial, naturally occurring radioactive material (NORM) waste with a radium-226 concentration not to exceed 2,000 picocuries per gram. NORM material is not regulated by the Nuclear Regulatory Commission.

E. The State's proposed programs for low-level radioactive waste disposal are assessed under Criteria numbers

9, ''Radioactive Waste Disposal'' and 20 ''Qualification of Regulatory and Inspection Personnel.'' Additional criteria relating to prior evaluation of uses of radioactive materials, inspection and administration, sup 2 fn are addressed as appropriate to supplement information found in the staff assessment of the original Utah proposed agreement published in the Federal Register on December 30, 1983 (48 FR 57674-57684).

fn sup 2 Criteria 13, ''Prior Evaluation of Hazards and Uses Exceptions,'' 14, ''Evaluation Criteria,'' 16, ''Inspection, Purpose, Frequency,'' and 27, ''Coverage, Amendments reciprocity.''

II. NRC Staff Assessment of the Proposed Amendment to Utah Program for Control of Agreement Materials

Reference: Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement. sup 3 fn fn sup 3 NRC Statement of Policy published in the Federal Register January 23, 1981 (46 FR 7540-7546). A correction was published July 16, 1981 (46 FR 36969) and a revision of Criterion 9 published in the Federal Register July 21, 1983 (48 FR 33376).

Objectives

9. Radioactive Waste Disposal.

(a) Waste disposal by material users. The standards for the disposal of radioactive materials into the air, water and sewer, and burial in the soil shall be in accordance with 10 CFR part 20. Holders of radioactive material desiring to release or dispose of quantities or concentrations of radioactive materials in excess of prescribed limits shall be required to obtain special permission from the appropriate regulatory authority.

Requirements for transfer of waste for the purpose of ultimate disposal at a land disposal facility (waste transfer and manifest system) shall be in accordance with 10 CFR part 20.

The waste disposal standards shall include a waste classification scheme and provisions for waste form, applicable to waste generators, that is equivalent to that contained in 10 CFR part 61.

(b) Land Disposal of waste received from other persons. The State shall promulgate regulations containing licensing requirements for land disposal of radioactive waste received from other persons which are compatible with the applicable technical definitions, performance objectives, technical requiremetns and applicable supporting sections set forth in 10 CFR part 61. Adequate financial arrangements (under terms established by regulation) shall be required of each waste disposal site licensee to ensure sufficient funds for decontamination, closure and stabilization of a disposal site. In addition, Agreement State financial arrangements for long-term monitoring and maintenance of a specific site must be reviewed and approved by the Commission prior to relieving the site operator of licensed responsibility (section 151(a)(2), Pub. L. 97-425).

The Utah regulations contain provisions relating to the disposal of radioactive materials into the air, water ans sewer and burial in soil which are essentially uniform with those of 10 CFR part 20. Waste transfer and manifest system requirements for transfer of waste for ultimate disposal at a land disposal facility are included in the Utah regulations. The waste disposal requirements include a waste classification scheme and provisions for waste form equivalent to that in 10 CFR part 61.

The Utah regulations provide for land disposal of low-level radioactive waste received from other persons which are compatible with the applicable technical definitions, performance objectives, technical requirements and supporting sections set out in 10 CFR part 61. The Utah regulations include provisions for financial arrangements for decontamination, closure and stabilization. Under the Nuclear Waste Policy Act of 1982 (Pub. L. 97-425), the financial arrangements for long term monitoring and maintenance at specific sites in Utah will be subject to Commission review and approval prior to Utah relieving the site operator of licensed responsibility.

References: URC-R447-15-310, URC-R447-15-302, URC-R447-15-303, URC-R447-304, URC-R447-15-304, URC-R447-15-306, URC-R447-15-307, URC-R447-15-308, URC-R447-15-309, URC-R447-15-311, URC-R447-25; Section 151(a)(2), Pub. L. 97-425.

Prior Evaluation of Uses of Radioactive Materials

13. Prior Evaluation of Hazards and Uses, Exceptions

In the present state of knowledge, it it necessary in regulating the possession and use of byproduct, source and special nuclear materials that the State regulatory authority require the submission of information on, and evaluation of, the potential hazards and the capability of the user or possessor prior to his receipt of the materials. This criterion is subject to certain exceptions and to continuing reappraisal as knowledge and experience in the atomic energy field increase. Frequently there are, and increasingly in the future there may be, categories of materials and uses as to which there is sufficient knowledge to permit possession and use without prior evaluation of the hazards and the capability of the possessor and user. These categories fall into two groups-those materials and uses which may be completely exempt from regulatory controls, and those materials and uses in which sanctions for misuse are maintained without pre-evaluation of the individual possession or use. In authorizing research and development or other activities involving multiple uses of radioactive materials, where an institution has people with extensive training and experience, the State regulatory

authority may wish to provide a means for authorizing broad use of materials without evaluating each specific use.

Prior to the issuance of a specific license for the disposal of radioactive materials, the Utah Bureau of Radiation Control will required the submission of information on, and will make an evaluation of, the potential hazards of such uses, and the capability of the applicant.

References: URC-447-25, Utah Program Statement, section III.D
''Procedures for Review of a Low-Level Radioactive Waste Disposal License Application.''

14. Evaluation Criteria

In evaluating a proposal to use radioactive materials, the regulatory authority shall determine the adequacy of the applicant's facilities and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. This guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

In evaluating a proposal for disposal of radioactive material, the Utah Bureau of Radiation Control will make the findings required by URC-R447-25-11, including, among other, findings that the issuance of the license will not constitute an unreasonable risk to the health and safety of the public and that the applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life or property.

Other special requirements for the issiance of specific licenses are contained in the regulations.

References: URC-R447-25, see, especially, R447-25-11, Utah Program Statement, Section III.D. ''Procedures for Review of a Low-Level Radioactive Waste Disposal License Application.''

Inspection

16. Purpose, Frequency

The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine and to assist in obtaining compliance with regulatory requirements. Frequency of inspection shall be related directly to the amount and kind of material and type of operation licensed, and it shall be adequate to insure compliance.

Utah low-level waste disposal icensees will be subject to inspection by the Bureau of Radiation Control. Upon instruction from the Bureau, licensees shall perform or permit the Bureau to perform such reasonable tests and surveys as the Bureau deems appropriate or necessary. The frequency of inspections is dependent upon the type and scope of the licensed activities and will be at least as frequent as inspections of similar licensees by NRC. Generally, inspections will be unannounced.

References: Utah Program Statement, section III.E ''Compliance Program for a Low-Level Radioactive Waste Disposal Facility.''

Personnel

20. Qualifications of Regulatory and Inspection Personnel

The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspection of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments-their selection, use, and calibration-laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology, and engineering disciplines.1To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear materials which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such a person have a bachelor's degree or equivalent in the physical or life sciences, and specific training in radiation protection.1It is recognized that there will also be persons performing a more limited function in evaluation and inspection. These pesons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's

degree or equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.1The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the ratiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirement for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will require skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or as its command, not only for routine functions, but also for emergency cases.

Licensing and Regulation of Permanent Disposal of Low-Level Radioactive Waste-(a) Number of Personnel. There are approximately 230 specific licenses in the State of Utah. The Bureau of Radiation Control has responsibility for the low-level waste (LLW) management regulatory program as a joint function of Radioactive Materials and Machine Licensing Section and Environmental Monitoring and Mill Tailings Management Section. The assessment of the regulatory framework is included under Criterion 9, ''Radioactive Waste Disposal.'' The Bureau of Radiation Control has identified seven staff members who will provide supervision, technical support and administrative assistance during the various phases of regulating a licensed low-level waste disposal facility. These personnel and summaries of their duties are:
Larry F. Anderson: Director, Bureau of Radiation Control. Responsible for administration of Bureau programs.

Mark S. Day: Environmental Health Engineer. Responsible for the Utah's inactive uranium mill tailings remedial action project.

Dane L. Finerfrock: Environmental Health Manager, Environmental Monitoring and Mill Tailings Management Section. Responsible for radon-in-residences monitoring, statewide environmental radiation monitoring, licensing and inspection of low-level radioactive waste disposal facilities, and inactive uranium mill tailings remedial action programs.

Blaine N. Howard: Health Physicist. Responsible for licensing and inspection in materials program.

John D. Hultquist: Environmental Health Scientist. Responsible for inspection of low-level waste disposal facilities, environmental monitoring and inactive uranium mill tailings remedial action project.

Craig W. Jones: Environmental Health Manager, Radioactive Materials and Machine Licensing Section. Responsible for the Agreement State program including licensing and inspection of low-level disposal facilities.

Raymond G. Nelson: Environmental Health Scientist. Responsible for regulation of low-level waste disposal facilities, environmental monitoring and inactive uranium mill tailings remedial action project.

Cindy Wignall: Environmental Health Technician. Responsible for supporting both sections as a technical assistant in meeting the Bureau's goals.

In addition, Utah has identified staff with expertise in various disciplines within the Department and other State agencies for support during the pre-operational and licensing stage. Expertise in disciplines not provided by Utah personnel either on staff or covered by agreements with other State agencies will be provided by contracts with the State.

Reference: Utah Program Statement, section II.D ''Low-Level Radioactive Waste Management,'' section IV ''Staffing, Supervision, and Equipment for a Low-Level Waste Program,'' and Appendix E.

Administration

27. Coverage, Amendments, Reciprocity

The proposed amendment to the Utah agreement provides for the assumption of regulatory authority over land disposal of source, byproduct and special nuclear material received from other persons.

Reference: Proposed Amendment to Agreement, section I.

III. Staff Conclusion

Section 274d of the Atomic Energy Act of 1954, as amended, states:

The Commission shall enter into an agreement under subsection b of this section with any State if-

(1) The Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

(2) the Commission finds that the State program is in accordance with the requirements of subsection o. and in all other respects compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

The staff has concluded that the State of Utah meets the requirements of section 274 of the Act. The State's statutes, regulations, personnel, licensing, inspection and administrative procedures are compatible with those of the Commission and adequate to protect the public health and safety with respect to the materials covered by the proposed amendment to the Utah agreement. Since the State is not seeking authority over uranium milling activities, subsection O. is not applicable to the proposed amendment to the Utah amended agreement.

Dated at Rockville, Maryland, this 7th day of November 1989.

For the U.S. Nuclear Regulatory Commission.

Carlton Kammerer,

Director, State, Local and Indian Tribe Programs, Office of Governmental and Public Affairs.

Appendix A

Amendment to Agreement Between the United States Nuclear Regulatory Commission and the State of Utah for Discontinuance of Certain Commission Regulatory Authority and Responsibility Within the State Pursuant to Section 274 of the Atomic Energy Act of 1954, as Amended

Whereas, the United States Nuclear Regulatory Commission (hereinafter referred to as the Commission) entered into an Agreement (hereinafter referred to as the Agreement of March 29, 1984) with the State of Utah under section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act), which Agreement became effective on April 1, 1984, and provided for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8 and Section 161 of the Act with respect to byproduct materials as defined in section 11e.(1) of the Act, source materials, and special nuclear materials in quantities not sufficient to form a critical mass; and

Whereas, the Governor of the State of Utah is authorized under Utah Code Annotated 26-1-29 to enter into this amendment to the Agreement of March 29, 1984, between the Commission and the State of Utah; and

Whereas, The Governor of the State of Utah has requested this amendmen in accordance with section 274 of the Act by certifying on (date to be inserted) that the State of Utah has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the land disposal within the State of source, byproduct and special nuclear material received from other persons and that the State desires to assume regulatory responsibility for such materials; and

Whereas, The Commission found on (date to be inserted), that the program for regulation of materials covered by the amendment is in accordance with the requirements of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect public health and safety; and

Whereas, The State and the Commission recognize the desirability and importance of cooperation between the Commission and the State in the formulation of standards for protection against hazards of radiation and in assuring that the State and Commission programs for protection against hazards of radiation will be coordinated and compatible; and Whereas, this amendment to the Agreement of March 29, 1989, is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended.

Now, therefore, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

Section 1. Article I of the Agreement of March 29, 1984, is amended by deleting ''and'' at the end of paragraph B., by adding '';and,'' after the words ''critical mass'' in paragraph C., and by inserting the following new paragraph immediately after paragraph C.:

D. The land disposal of source, byproduct and special nuclear material received from other persons.

Section 2. Article II of the Agreement of March 29, 1984, is amended by deleting paragraph E. and by redesignating paragraph F. as paragraph E.

This amendment shall become effective on (date to be inserted), and shall remain in effect unless and until such time as it is terminated pursuant to Article VIII of the Agreement of March 29, 1984.

Done at Salt Lake City, Utah, in triplicate, this ---- day of ----, 1989.

For the United States Nuclear Regulatory Commission.

Kenneth M. Carr,
Chairman

For the State of Utah.

Norman H. Bangerter,
Governor

INTERNAL DATA: FR Doc. 89-26; Filed 11-14-89; 8:45 am; BILLING CODE 7590-01-M

Citation 347

<DIALOG File 669: (c) U.S. Govt Printing Office>
0063631
Title: Staff Assessment of Proposed Amended Agreement Between the Nuclear Regulatory Commission and the State of Utah, Vol. 54, No. 219
Date: Wednesday, November 15, 1989
AGENCY: NUCLEAR REGULATORY COMMISSION; U. S. Nuclear Regulatory Commission.
DOC TYPE: Notices
Comments must be received on or before December 15, 1989.

CONTACT: Vandy L. Miller, State, Local and Indian Tribe Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone: 301-492-0326.
Submit comments to: the Secretary of the Commission, U.S. Nuclear Regualtory Commission, Washington, DC 20555. ATTN: Docketing and Services Branch. Comments may also be delivered to 11555 Rockville Pike, Rockville, Maryland from 7:45 a.m. to 4:15 p.m. Monday through Friday. Copies of comments received by NRC may be examined at the NRC Public Document Room, 2120 L Street, NW., Washington, DC. Notice of Proposed Amended Agreement with the State of Utah. Notice is hereby given that the U.S. Nuclear Regulatory Commission (NRC) is publishing for public comment the NRC staff assessment of a proposed amended agreement received from the Governor of the State of Utah for the assumption of certain of the Commission's regulatory authority pursuant to section 274 of the Atomic Energy Act of 1954, as amended. Comments are requested on the public health and safety aspects of the proposal.

A staff assessment of the State's proposed amended program for control over sources of radiation is set forth below as supplementary information to this notice. A copy of the proposed amended agreement, program narrative, including the referenced appendices, applicable State legislation and Utah regulations, is available for public inspection in the Commission's public document room at 2120 L Street, NW, Washington, DC. Exemptions from the Commission's regulatory authority, which would implement this proposed amended agreement, have been published in the Federal Register and codified as part 150 of the Commission's regulations in Title 10 of the Code of Federal Regulations.

WORD COUNT: 5744
TEXT:
Assessment of proposed amended Utah Program to regulate certain radioactive materials pursuant to section 274 of the Atomic Energy Act of 1954, as amended.

The Commission has received a proposal from the Governor of Utah for the State to amend its agreement with the NRC whereby the NRC would relinquish and the State would assume regulatory authority for land disposal of source, byproduct and special nuclear material received from other persons pursuant to section 274 of the Atomic Energy Act of 1954, as amended.

Section 274e of the Atomic Energy Act of 1954, as amended, requires that the terms of the proposed agreement be published for public comment once each week for four consecutive weeks. Accordingly, this notice will be published four times in the Federal Register.

I. Background

A. Section 274 of the Atomic Energy Act of 1954, as amended, provides a mechanism whereby the NRC may transfer

to the States certain regulatory authority over agreement materials fn 1 when a State desires to assume this authority and the Governor certifies that the State has an adequate regulatory program, and when the Commission finds that the State's program is compatible with that of the NRC and is adequate to protect the public health and safety. Section 274g directs the Commission to cooperate with the States in the formulation of standards for protection against radiation hazards to assure that State and Commission programs for radiation protection will be coordinated and compatible. Further, section 274j provides that the Commission shall periodically review such agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this section.

fn 1 A. Byproduct materials as defined in 11e.(1)

B. Byproduct materials as defined in 11e(2)

C. Source materials; and

D. Special nuclear materials in quantities not sufficient to form a critical mass

B. On March 29, 1984, the Governor of Utah signed an agreement with the NRC for the assumption of regulatory authority for byproduct material as defined in section 11e.(1) of the Act, source material and special nuclear material in quantities not sufficient to form a critical mass. In a letter dated July 17, 1989, Governor Norman H. Bangerter of the State of Utah requested that the Commission enter into an amended agreement with the State pursuant to section 274 of the Atomic Energy Act of 1954, as amended, under which the State would also assume responsibility for regulating the land disposal of these materials received from other persons. The Governor certified that the State of Utah has a program for control of radiation hazards which is adequate to protect the public health and safety with respect to the materials within the State covered by the proposed amendment to the agreement, and that the State of Utah desires to assume regulatory responsibility for such materials. The text of the proposed agreement is shown in Appendix A.

The specific authority requested is for permanent disposal of low-level waste containing the material for which Utah has assumed regulatory authority under the 1984 agreement but not containing uranium and thorium mill tailings (byproduct material as defined in section 11e.(2) of the Act). The State does not wish to assume authority over uranium recovery activities. The State, however, reserves the right to apply at a future date to NRC for an amended agreement to assume authority in this area. The proposed amendment to the agreement covers the following areas:

1. Amending Article I of the Agreement of March 29, 1984 to add land disposal of source, byproduct and special nuclear material received from other persons to the list of materials covered by the agreement.

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3. Specifies the effective date of the amended agreement.

C. Utah Code Annotated (UCA) 26-1-27 through 26-1-29 authorizes the State Department of Health to issue licenses to, and perform inspections of (see, also, UCA 26-23-8), users of radioactive materials under the 1984 agreement and otherwise carry out a total radiation control program. Utah Radiation Control Rules URC-10 through URC-80 adopted November 8, 1982 under authority of 26-1-27 through 26-1-29 Utah Code Annotated 1953, as amended, provide standards, licensing, inspection, enforcement and administrative procedures for agreement and non-agreement materials. These regulations have been determined to be compatible with the Commission's regulations. Utah Radiation Control Rules R447-10 through R447-70 were amended and recodified in July 1989. Regulations R447-25 were adopted in July 1988 for licensing requirements for land disposal of radioactive waste.

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E. The State's proposed programs for low-level radioactive waste disposal are assessed under Criteria numbers 9, ''Radioactive Waste Disposal'' and 20 ''Qualification of Regulatory and Inspection Personnel.'' Additional criteria relating to prior evaluation of uses of radioactive materials, inspection and administration, sup 2 fn are addressed as appropriate to supplement information found in the staff assessment of the original Utah proposed agreement published in the Federal Register on December 30, 1983 (48 FR 57674-57684).

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Exceptions,'' 14, ''Evaluation Criteria,'' 16, ''Inspection, Purpose, Frequency,'' and 27, ''Coverage, Amendments Reciprocity.''

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Prior Evaluation of Uses of Radioactive Materials

13. Prior Evaluation of Hazards and Uses, Exceptions

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Prior to the issuance of a specific license for the disposal of radioactive materials, the Utah Bureau of Radiation Control will require the submission of information on, and will make an evaluation of, the potential

hazards of such uses, and the capability of the applicant.

References: URC-447-25, Utah Program Statement, section III.D
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14. Evaluation Criteria

In evaluating a proposal to use radioactive materials, the regulatory authority shall determine the adequacy of the applicant's facilities and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. This guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

In evaluating a proposal for disposal of radioactive material, the Utah Bureau of Radiation Control will make the findings required by URC-R447-25-11, including, among others, findings that the issuance of the license will not constitute an unreasonable risk to the health and safety of the public and that the applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life or property.

Other special requirements for the issuance of specific licenses are contained in the regulations.

References: URC-R447-25, see, especially, R447-25-11, Utah Program Statement, Section III.D. "Procedures for Review of a Low-Level Radioactive Waste Disposal License Application."

Inspection

16. Purpose, Frequency

The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine and to assist in obtaining compliance with regulatory requirements. Frequency of inspection shall be related directly to the amount and kind of material and type of operation licensed, and it shall be adequate to insure compliance.

Utah low-level waste disposal licensees will be subject to inspection by the Bureau of Radiation Control. Upon instruction from the Bureau, licensees shall perform or permit the Bureau to perform such reasonable tests and surveys as the Bureau deems appropriate or necessary. The frequency of inspections is dependent upon the type and scope of the licensed activities and will be at least as frequent as inspections of similar licensees by NRC. Generally, inspections will be unannounced.

References: Utah Program Statement, section III.E "Compliance Program for a Low-Level Radioactive Waste Disposal Facility."

Personnel

20. Qualifications of Regulatory and Inspection Personnel

The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspection of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments-their selection, use, and calibration-laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology, and engineering disciplines.

To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear material which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such a person have a bachelor's degree or equivalent in the physical or life sciences, and specific training in radiation protection.

It is recognized that there will also be persons performing a more limited function in evaluation and inspection. These persons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's degree or

equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.

The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the radiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirement for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will require skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or as its command, not only for routine functions, but also for emergency cases.

Licensing and Regulation of Permanent Disposal of Low-Level Radioactive Waste-(a) Number of Personnel. There are approximately 230 specific licenses in the State of Utah. The Bureau of Radiation Control has responsibility for the low-level waste (LLW) management regulatory program as a joint function of Radioactive Materials and Machine Licensing Section and Environmental Monitoring and Mill Tailings Management Section. The assessment of the regulatory framework is included under Criterion 9, ''Radioactive Waste Disposal.'' The Bureau of Radiation Control has identified seven staff members who will provide supervision, technical support and administrative assistance during the various phases of regulating a licensed low-level waste disposal facility. These personnel and summaries of their duties are:
Larry F. Anderson: Director, Bureau of Radiation Control. Responsible for administration of Bureau programs.

Mark S. Day: Environmental Health Engineer. Responsible for the Utah's inactive uranium mill tailings remedial action project.

Dane L. Finerfrock: Environmental Health Manager, Environmental Monitoring and Mill Tailings Management Section. Responsible for radon-in-residences monitoring, statewide environmental radiation monitoring, licensing and inspection of low-level radioactive waste disposal facilities, and inactive
uranium mill tailings remedial action programs.

Blaine N. Howard: Health Physicist. Responsible for licensing and inspection in materials program.

John D. Hultquist: Environmental Health Scientist. Responsible for inspection of low-level waste disposal facilities, environmental monitoring and inactive uranium mill tailings remedial action project.

Craig W. Jones: Environmental Health Manager, Radioactive Materials and Machine Licensing Section. Responsible for the Agreement State program including licensing and inspection of low-level disposal facilities.

Raymond G. Nelson: Environmental Health Scientist. Responsible for regulation of low-level waste disposal facilities, environmental monitoring and inactive uranium mill tailings remedial action project.

Cindy Wignall: Environmental Health Technician. Responsible for supporting both sections as a technical assistant in meeting the Bureau's goals.

In addition, Utah has identified staff with expertise in various disciplines within the Department and other State agencies for support during the pre-operational and licensing stage. Expertise in disciplines not provided by Utah personnel either on staff or covered by agreements with other State agencies will be provided by contracts with the State.

Administration

27. Coverage, Amendments, Reciprocity

The proposed amendment to the Utah agreement provides for the assumption of regulatory authority over land disposal of source, byproduct and special nuclear material received from other persons.

Reference: Proposed Amendment to Agreement, section I.

III. Staff Conclusion

Section 274d of the Atomic Energy Act of 1954, as amended, states:

The Commission shall enter into an agreement under subsection b of this section with any State if-

(1) The Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

(2) the Commission finds that the State program is in accordance with the requirements of subsection O. and in all other respects compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

The staff has concluded that the State of Utah meets the requirements of section 274 of the Act. The State's statutes, regulations, personnel, licensing, inspection and administrative procedures are compatible with those of the Commission and adequate to protect the public health and safety with respect to the materials covered by the proposed amendment to the Utah agreement. Since the State is not seeking authority over uranium milling activities, subsection O. is not applicable to the proposed amendment to the Utah amended agreement.

Dated at Rockville, Maryland, this 7th day of November 1989.

For the U.S. Nuclear Regulatory Commission.

Carlton Kammerer,

Director, State, Local and Indian Tribe Programs, Office of Governmental and Public Affairs.
Appendix A

Amendment to Agreement Between the United States Nuclear Regulatory Commission and the State of Utah for Discontinuance of Certain Commission Regulatory Authority and Responsibility Within the State Pursuant to Section 274 of the Atomic Energy Act of 1954, as Amended

Whereas, the United States Nuclear Regulatory Commission (hereinafter referred to as the Commission) entered into an Agreement (hereinafter referred to as the Agreement of March 29, 1984) with the State of Utah under section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act), which Agreement became effective on April 1, 1984, and provided for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8 and Section 161 of the Act with respect to byproduct materials as defined in section 11e.(1) of the Act, source materials, and special nuclear materials in quantities not sufficient to form a critical mass; and

Whereas, the Governor of the State of Utah is authorized under Utah Code Annotated 26-1-29 to enter into this amendment to the Agreement of March 29, 1984, between the Commission and the State of Utah; and

Whereas, The Governor of the State of Utah has requested this amendment in accordance with section 274 of the Act by certifying on (date to be inserted) that the State of Utah has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the land disposal within the State of source, byproduct and special nuclear material received from other persons and that the State desires to assume regulatory responsibility for such materials; and

Whereas, The Commission found on (date to be inserted), that the program for regulation of materials covered by this amendment is in accordance with the requirements of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect public health and safety; and

Whereas, The State and the Commission recognize the desirability and importance of cooperation between the Commission and the State in the formulation of standards for protection against hazards of radiation and in assuring that the State and Commission programs for protection against hazards of radiation will be coordinated and compatible; and

Whereas, this amendment to the Agreement of March 29, 1989, is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended.

Now, therefore, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

Section 1. Article I of the Agreement of March 29, 1984, is amended by deleting ''and'' at the end of paragraph B., by adding '';and,'' after the words ''critical mass'' in paragraph C., and by inserting the following new paragraph immediately after paragraph C.:

D. The land disposal of source, byproduct and special nuclear material received from other persons.
Section 2. Article II of the Agreement of March 29, 1984, is amended by deleting paragraph E. and by redesignating paragraph F. as paragraph E.

This amendment shall become effective on (date to be inserted), and shall remain in effect unless and until such

time as it is terminated pursuant to Article VIII of the Agreement of March 29, 1984.

Done at Salt Lake City, Utah, in triplicate, this __ day of __, 1989.

For the United States Nuclear Regulatory Commission.

Kenneth M. Carr,
Chairman

For the State of Utah.

Norman H. Bangerter,
Governor
INTERNAL DATA: FR Doc. 89-267; Filed 11-14-89; 8:45 am; BILLING CODE
7590-01-M

Citation 348

<DIALOG File 654: >
02180448 DIALOG File 654: U.S. Patents-Full Text (1990-) Utility
Title: NONHAZARDOUS SOLVENT COMPOSITION AND METHOD FOR CLEANING METAL SURFACES
PATENT NO.: 5,207,838
ISSUED: May 04, 1993 (19930504)
INVENTOR(s): Googin, John M., Oak Ridge, TN (Tennessee), US (United States of America)
Simandl, Ronald F., Farragut, TN (Tennessee), US (United States of America)
Thompson, Lisa M., Knoxville, TN (Tennessee), US (United States of America)
ASSIGNEE(s): Martin Marietta Energy Systems, Inc, (A U.S. Company or Corporation), Oak Ridge, TN (Tennessee), US (United States of America)
APPL. NO.: 7-751,912
FILED: gust 29, 1991 (19910829)
This invention was made with Government support under contract DE-AC05-84OR21400 awarded by the U.S. Department of Energy to Martin Marietta Energy Systems, Inc. and the Government has certain rights in this Invention.

U.S. CLASS: 134-42 cross ref: 134-40; 252-542; 252-153; 252-170
INTL CLASS: [5] C23G 5-024; C23G 5-032; C23G 5-036
FIELD OF SEARCH: 252-542; 252-153; 252-170; 134-40; 134-42

References Cited

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4,921,629 5/1990 Malihi et al. 252-170
5,024,780 6/1991 Leys 252-542

PRIMARY EXAMINER: Garvin, Patrick P.
ATTORNEY, AGENT, OR FIRM: Holsopple, Herman L.; Adams, Harold W.
CLAIMS: 10
EXEMPLARY CLAIM: 7
ART UNIT: 116

Citation 349

<DIALOG File 194: >
2906038
HAZARDOUS WASTE COLLECTION/DISPOSAL
Due 043092. POC Janet Magevney, Contract Specialist, 513-366-2040.
Abstract: The U.S. Environmental Protection Agency is seeking responsible sources for the disposal of non-radioactive chemical waste, including preparation and packaging on location with shipping and disposal in compliance with all existing laws and regulations including DOT Hazardous Materials Regulations in 49CFR100 et. seq. and EPA Hazardous Waste Regulations in 40CFR2650 et. seq., and laws and regulations of any state, county, township, or municipal subdivision thereof, or other governmental agency which may be applicable to the removal of the waste. Complete information regarding quantity, location, description, packaging, testing transportation, disposal reports requirements is available on request. Qualifications: to be considered responsible, the vendor must be an established and recognized provider of the same or similar services with adequate capacity and personnel to perform the work and have a satisfactory record of performance. The vendor must have adequate financial resources to assure undertaking correction of any environmental damage resulting from action involving the waste. References from past customers shall be provided if requested. The vendor must maintain adequate insurance covering during the entire period of his performance and provide documentation of insurance. Vendor must have ''cradle-to-grave'' manifest system and designation of final disposal site in Box 9 of Uniform Manifest. Must have prior assurance that no regulatory actions are presently pending against these final disposal sites, also prior assurance that special policy limitations for certain waste classifications at those disposal facilities are being met. Vendor must assure that all interstate statutory transportation requirement and regulations for out-of-state disposal facilities are being met. This is not an RFP. For information contact Janet Magevney, U.S. EPA, 5613-366-2040 or fax request to 513/366-2004. (098)

SPONSOR: Environmental Protection Agency, Contracts Management Division, Cincinnati, OH 45268-7001
SUBFILE: PSE (U.S. GOVERNMENT PROCUREMENTS, SERVICES)
SECTION HEADING: S Utilities and Housekeeping Services Potential Sources Sought
PUBLICATION DATE: APRIL 13, 1992
ISSUE: PSA-0572

Citation 350

<DIALOG File 653: >
01717046 DIALOG File 653: U.S. Patents-Full Text (1980-89) Utility
Title: Disposable hazardous and radioactive liquid aqueous waste composition and method
PATENT NO.: 4,781,860
ISSUED: November 01, 1988 (19881101)
INVENTOR(s): Doan, Darryl J., Laurel, MT (Montana), US (United States of America)
ASSIGNEE(s): Ayres, James W, (A U.S. Individual), Las Vegas, NV (Nevada), U S (United States of America)
Rowsell, Farrell D, (A U.S. Individual), Las Vegas, NV (Nevada), US (United States of America)
APPL. NO.: 7-54,139
FILED: May 11, 1987 (19870511)

REFERENCE TO OTHER APPLICATIONS

This is a continuation of co-pending application Ser. No. 06-821,906, filed on Jan. 23, 1986, now abandoned, and a continuation-in-part of my application Ser. No. 818,323, filed Jan. 13, 1986.

U.S. CLASS: 252-628 cross ref: 210-680; 210-681; 210-682; 210-691; 210-751; 210-908; 210-909; 210-910; 252-631; 252-633; 405-128; 405-129
INTL CLASS: [4] G21F 9-16; G21F 9-08; C02F 1-42; C02F 1-68
FIELD OF SEARCH: 252-628; 252-626; 252-631; 252-633; 405-128; 405-129; 210- 679; 210-680; 210-681; 210-682; 210-690; 210-691; 210-751; 210 -908; 210-909; 210-910

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3,196,106 7/1965 Haden et al. 252-628
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3,487,928 1/1970 Canevari 210-682
4,113,504 9/1978 Chen et al. 106-97

4,439,062 3/1984 Kingsbury 405-35
4,473,477 9/1984 Beall 210-691

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Hurlbut et al. 1977. Manual of Mineralogy--19th Edition. John Wiley & Sons, New York. pp. 402-403.

PRIMARY EXAMINER: Lechert, Jr., Stephen J.
ASST. EXAMINER: Locker, Howard J.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 14
EXEMPLARY CLAIM: 1
ART UNIT: 223

ABSTRACT

An improved method of disposing of radioactive or hazardous liquid aqueous waste compositions having a substantial amount of dissolved solids comprises mixing the liquid under a high mechanical shear with a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof. Water soluble or miscible organic liquids as well as liquid hydrocarbon mixtures thereof may also be solidified by utilizing the aforesaid clays together with an organic ammonium montmorillonite having at least 10 carbon atoms, the amount of montmorillonite used being proportional to the amount of liquid hydrocarbon present.

I claim:

1. A method of disposing of radioactive or hazardous liquid wastes comprising a water soluble or miscible organic liquid, an aqueous solution having a dissolved solids content of about 5,000 parts per million or more, and mixtures thereof comprising adding thereto between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of said liquid and stirring the mixture under high mechanical shear until it is substantially solidified.

2. The method of claim 1 wherein said composition is subjected to high shear stirring of at lease about 500 rpm.

3. The method of claim 1 wherein said composition is subjected to high shear stirring of at least about 1,000 rpm.

4. A method of disposing of radioactive or hazardous water soluble or miscible organic liquids and having between about 5% and about 95% liquid hydrocarbon by volume, comprising mixing said liquid with a mixture of clay selected from the group attapulgite, sepiolite, and mixtures thereof and an organic ammonium montmorillonite having at least 10 carbon atoms at a ratio of clay:organic ammonium montmorillonite about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, by volume, respectively, and wherein the amount of said clay and organic ammonium montmorillonite mixture is between about 2.5 and about 5.5 pounds per gallon of total bulk liquid, and stirring the mixture under high mechanical shear until it is substantially solidified.

5. The method of claim 4 including adding between about 1 and about 10% by volume of a polar organic compound based on the hydrocarbon.

6. The method of claim 4 including adding between about 1 and about 10% of an alcohol having between 1 and 3 carbon atoms based on the hydrocarbon.

7. A method of disposing of an aqueous radioactive or hazardous liquid having a dissolved solids content of between about 5,000 and about 30,000 parts per million comprising adding thereto a mixture of between about 55% and about 95% of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof and between about 5% and about 45%, by weight, sodium montmorillonite having sodium as the major exchangeable cation, said mixture added in an amount of between about 1.5 and about 4.0 pounds per gallon of said liquid, and stirring the mixture under high mechanical shear until it is substantially solidified.

8. A substantially solidified hazardous or radioactive composition consisting essentially of water soluble or miscible organic liquid, an aqueous solution having a dissolved solids content of at least about 20,000 parts per million, and mixtures thereof, and between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attaqulgite, sepiolite, and mixtures thereof per gallon of liquid.

9. The composition of claim 8 wherein said water soluble or miscible organic liquid is selected from the group consisting of polyhydric alcohols, glycyerols, and plyalkylene glycols.

10. A substantially solidified hazardous or radioactive composition consisting essentially of an aqueous solution having between about 5,000 and about 30,000 parts per million dissolved solids and a mixture of between about 55% and about 95% by weight of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof, and between about 5% and about 45%, by weight sodium montmorillonite having sodium as the major cation said mixture of said clay and sodium montmorillonite being present in an amount of between about

1.5 and about 4.0 pounds per gallon of said liquid.

11. The composition of claim 10 including between about 5 and about 95% by volume based on said aqueous solution of a water soluble or miscible organic waste liquid selected from the group consisting of aldehydes, ketones, acids, ethers, esters, alcohols, polyols and polyglycols.

12. A substantially solidified hazardous or radioactive composition consisting essentially of a water soluble or miscibel organic liquid and a liquid hydrocarbon and a mixture of a clay selected from the group consisting of attapulgite, sepiolite, and mixtres thereof and an organic ammonium montmorillonite having at least 10 carbon atoms wherein said amount of said clay and said organic ammonium montmorillonite is between about 2.5 and about 5.5 pounds per gallon of said liquid. 13. The composition of claim 12 wherein the liquids comprise between about 5% and about 95% organic liquid and between about 5% and about 95% liquid hydrocarbon, by volume, and wherein the ratio of said clay:organic ammonium montrmorillonite is about directly proportional to the ratio of said organic liquid:liquid hydrocarbon, respectively.

14. The method of claim 1 including substituting between about 5 and about 45% of said clay with sodium montmorillonite.

Citation 351

<DIALOG File 653: >
01713576 DIALOG File 653: U.S. Patents-Full Text (1980-89)
Utility
Disposable hazardous and radioactive liquid hydrocarbon waste composition and method
PATENT NO.: 4,778,627
ISSUED: October 18, 1988 (19881018)
INVENTOR(s): Doan, Darryl J., Laurel, MT (Montana), US (United States of America)
ASSIGNEE(s): James William Ayres, (A U.S. Individual), Las Vegas, NV (Nevada), US (United States of America)
Farrell Dean Rowsell, (A U.S. Individual), Las Vegas, NV (Nevada), US (United States of America)
APPL. NO.: 7-54,141
FILED: May 11, 1987 (19870511)

This is a continuation of co-pending application Ser. No. 06-818,323, filed on Jan. 13, 1986 (abandoned).

U.S. CLASS: 252-631 cross ref: 210-682; 210-691; 210-751; 210-908; 210-909; 252-628; 252-633; 252-634; 252-635; 405-128; 405-129
INTL CLASS: [4] G21F 9-08; G21F 9-16; C09K 3-00
FIELD OF SEARCH: 252-628; 252-631; 252-626; 252-633; 252-635; 252-634; 405-128; 405-129; 210-679; 210-680; 210-681; 210-682; 210-690; 210-691; 210-693; 210-908; 210-909; 210-910; 106-285

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3,487,928 1/1970 Canevari 210-40
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4,439,062 3/1984 Kingsbury 405-35
4,473,477 9/1984 Beall 210-691

NON-U.S. PATENT DOCUMENTS

1280373 7/1972 GB (United Kingdom)

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PRIMARY EXAMINER: Lechert, Jr., Stephen J.
ASST. EXAMINER: Locker, Howard J.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 8
EXEMPLARY CLAIM: 1
ART UNIT: 223

ABSTRACT
An improved method of disposing of radioactive or hazardous liquid hydrocarbon compositions comprises placing the liquid hydrocarbons in a container and adding an organic ammonium montmorillonite in ratios of between about 1:2 and 3:1, by volume, respectively. The organic ammonium montmorillonite has at least 10 carbon atoms. A polar organic compound having between 1 and about 10 carbon atoms is also preferably added with the montmorillonite. Where the liquid waste material includes 5% or more of water in addition to the liquid hydrocarbon a minus 200 mesh sodium montmorillonite is also preferably added.

I claim:

1. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon composition comprising placing said radioactive or hazardous liquid hydrocarbon composition in a container and mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms until the composition comprises an unpourable, free standing solid.

2. The method of claim 1 wherein said organic ammonium montmorillonite comprises a quaternary ammonium montmorillonite.

3. A solidified hazardous or radioactive liquid hydrocarbon composition consisting essentially of said liquid hydrocarbon, an organic ammonium montmorillonite having at least 10 carbon atoms, and a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms, the ratio of said liquid hydrocarbon and said organic ammonium montmorillonite being between about 1:2 and about 3:1, by volume, respectively, and said alcohol being between about 1 and about 10% by volume of said liquid hydrocarbon and wherein said composition comprises an unpourable, free standing solid.

4. A method of disposing of a hazardous or radioactive liquid composition consisting essentially of between about 5 and about 95% liquid hydrocarbon nd between about 95 and about 5% water, by volume, respectively, comprising placing said liquid in a container, adding between about 2.3 and about 4.6 pounds of a mixture of an organic ammonium montmorillonite and sodium montmorillonite of at least 50% minus 200 mesh particle size per gallon of said liquid composition wherein the ratio of said organic ammonium montmorillonite: sodium montmorillonite is about directly proportional to the ratio of liquid hydrocarbon:water, by volume, respectively, and between 1 and about 10% aliphatic alcohol having between 1 and 8 carbon atoms based on the volume of said liquid hydrocarbon, while stirring to achieve an unpourable, free standing solid.

5. A solidified hazardous or radioactive liquid composition consisting essentially of a waste portion of between about 5 and about 95% liquid hydrocarbon and between about 95 and about 5% water, by volume, respectively, between about 2.3 and about 4.6 pounds of a mixture of an organic ammonium montmorillonite and sodium montmorillonite having a nominal particle size of minus 200 mesh per gallon of said waste portion, the ratio of organic ammonium montmorillonite:sodium montmorillonite being about directly proportional to the ratio of liquid hydrocarbon:water, by volume, respectively, and between 1 and about 10% aliphatic alcohol having between 1 and 8 carbon atoms based on the volume of said liquid hydrocarbon and wherein said composition comprises an unpourable, free standing solid.

6. The composition of claim 5 wherein said organic ammonium montmorillonite has at least 10 carbon atoms.

7. A method of treating a radioactive or hazardous waste material consisting essentially of liquid hydrocarbon comprising placing said radioactive or hazardous liquid hydrocarbon composition in a container and mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight polar organic compound having between 1 and about 10 carbon atoms selected from the group consisting of aliphatic ketones, aliphatic acetates and aliphatic alcohols until the composition is substantially solid.

8. The method of claim 7 wherein said polar organic compound is selected from the group consisting of isopropyl alcohol, hexyl alcohol, ethyl acetate and methyl ethyl ketone.

Citation 352

<DIALOG File 653: >
01710223 DIALOG File 653: U.S. Patents-Full Text (1980-89) Utility
Title: Hazardous and radioactive liquid waste disposal method
PATENT NO.: 4,775,494
ISSUED: October 04, 1988 (19881004)
INVENTOR(s): Rowsell, Farrell D., P.O. Box 304, Montpelier, ID (Idaho), US (United States of America), 83254
Ayres, James W., 5633 W. Palmyra, Las Vegas, NV (Nevada), US (United States of America), 89102
APPL. NO.: 7-54,140
FILED: May 11, 1987 (19870511)

This is a continuation of co-pending application Ser. No. 06-743,057, filed on June 10, 1985 (abandoned).

U.S. CLASS: 252-628 cross ref: 106-286.7; 106-286.8; 106-287.1; 210-679 210-680; 210-691; 210-909; 252-631; 405-128; 405-129
INTL CLASS: [4] G21F 9-16; G21F 9-08
FIELD OF SEARCH: 267-628; 267-631; 267-626; 267-633; 405-128; 405-129; 210- 699; 210-680; 210-681; 210-682; 210-691; 210-908; 210-909; 210 -910; 210-660; 210-671; 106-286.1; 106-286.7; 106-286.8; 106-2 87.1

References Cited

U.S. PATENT DOCUMENTS

3,167,504 1/1965 Hayden et al. 252-628
3,196,106 7/1965 Haden et al. 252-628
3,196,619 7/1965 Shock 252-628
3,274,784 9/1966 Shock et al. 252-628
3,487,928 1/1970 Canevari 210-682
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4,028,265 6/1977 Barney et al. 252-628
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4,439,062 3/1984 Kingsbury 405-129
4,473,477 9/1984 Beall 210-747
4,517,112 5/1985 Mardis 252-8.551

OTHER REFERENCES

Hurlbut et al. 1977, Manual of Mineralogy-19th edition, John Wiley and Sons, New York, pp. 402-403.

PRIMARY EXAMINER: Lechert, Jr., Stephen J.
ASST. EXAMINER: Locker, Howard J.
ATTORNEY, AGENT, OR FIRM: Seiler, Jerry R.
CLAIMS: 6
EXEMPLARY CLAIM: 2
ART UNIT: 223

ABSTRACT
In improved method of disposing of radioactive or hazardous liquids comprises placing the liquids in a container and adding a sodium montmorillonite over intervals until the composition is substantially solid in the container.

We claim:

1. An improved method of solidifying a radioactive or hazardous liquid comprising placing said liquid in a container and adding only sodium montmorillonite to said liquid in a ratio of sodium montmorillonite:liquid of between about 3:1 and 1:7, respectively, until the composition comprises an unpourable, free standing solid.

2. A method of solidifying a radioactive or hazardous liquid comprising at least about 95% water by adding only sodium montmorillonite having a major portion of particles between about 3/8 inch and 20 mesh thereto in a sodium montmorillonite:liquid ratio of between about 1:2 and about 1:7, respectively, in fractions with at least a few minutes interval between fractions, until the composition comprises an unpourable, free standing solid.

3. The method of claim 2 wherein each of said fractions is between about 10 and 50% of the total amount added.

4. The method of claim 2 wherein each of said fractions is between about 1/3 and 1/4 of the total amount added and wherein the intervals between fraction additions is at least about 10 minutes.

5. The method of claim 2 comprising placing between about 40 and 50 gallons of said liquid in a 55 gallon drum, and adding between about 150 and about 175 pounds of sodium montmorillonite to said liquid in fractions of between about 40 and about 55 pounds with at least about 10 minute intervals between fractions.

6. A method of solidifying a radioactive or hazardous liquid comprising at least about 5% hydrocarbon by adding only sodium montmorillonite having a major portion of particles of about 200 mesh or smaller thereto in a sodium montmorillonite:liquid ratio of between about 1:2 and 3:1, respectively, with stirring, until the composition comprises an unpourable, free standing solid.

Citation 353

<DIALOG File 5: (C. BIOSIS 1993)>
9874276 BIOSIS Number: 44124276
Title: Hazard ranking systems for chemical wastes and chemical waste sites
Author: Waters R D; Crutcher M R; Parker F L
Corporate Affiliation: Dep. Civ. Environ. Eng., Vanderbilt Univ., Nsshville, TN, USA.
Journal Announcement: Saxena, J, (ed.); Hazard Assessment of Chemicals, Vol. 8. XII+332P.
Taylor & Francis, Inc.: Bristol, Pennsylvania, USA; London, England, UK.
ISBN 1-56032-271-3. 0 (0). 1993. 115-170. CODEN: HACCD
Language: English
Subfile: BARRM (Biological Abstracts/RRM)
Descriptors/Keywords: Radioactive waste classification hazardous waste classification methodology
Concept Codes:
22506 136Toxicology-Environmental and Industrial Toxicology
37015 136Public Health: Environmental Health-Air, Water and Soil Pollution
10060 136Biochemical Studies-General

Citation 354

<DIALOG File 5: (C. BIOSIS 1993)>
6555287 BIOSIS Number: 86021838
Title: Comparisons of radioactive and chemical wastes
Author: Martin, J E
Corporate Affiliation: Univ. Michigan, Sch. Public Health, Ann Arbor, Mich. 48109-2029.
Journal Announcement: Hazard Waste Hazard Mater 5 (1). 1988. 73-84. CODEN: HWHME
Full Journal Title: Hazardous Waste & Hazardous Materials
Language: ENGLISH
Subfile: BA (Biological Abstracts)
Abstract: Radioactive and chemical wastes represent a wide range of technical and policy issues, with numerous similarities and differences. The transfer of information from one to guide control decisions and policies for the other has been minimal perhaps because of perspective. Study of the features of these two waste categories indicates that radioactive waste management could profit from the siting and waste categorization approaches used for chemical wastes; industrial waste management could profit from the experience base developed for radioactive wastes on approaches used in risk assessment, control of bulk wastes, and use of geologic isolation for highly toxic wastes.
Descriptors/Keywords: HUMAN HEALTH RISK GEOLOGIC ISOLATION
Concept Codes:
06506 Radiation-Radiation Effects and Protective Measures
13002 Metabolism-General Metabolism; Metabolic Pathways
22506 Toxicology-Environmental and Industrial Toxicology
37014 Public Health: Environmental Health-Sewage Disposal and Sanitary Measures
37015 Public Health: Environmental Health-Air, Water and Soil Pollution
37017 Public Health: Environmental Health-Radiation Health
52805 Soil Science-Physics and Chemistry (1970-)
06504 Radiation-Radiation and Isotope Techniques
10060 Biochemical Studies-General
Biosystematic Codes:
86215 Hominidae
Super Taxa:
Animals; Chordates; Vertebrates; Mammals; Primates; Humans

Citation 355

<DIALOG File 16: (Copr. 1993 Predicasts)>
02593257 DIALOG FILE 16: PTS PROMT
RADIOACTIVE WASTE CLASSIFICATION

Industrial Health & Hazards Update March 00, 1990 p. N/A

This ORNL (Oak Ridge National Laboratory) document contains an outline of historical developments in the U.S. of different classes/categories of radioactive wastes, the laws and regulations regarding classification of radioactive wastes, and requirements for disposal and treatment of different classes of radioactive wastes. (Order from Merton Allen Associates: Report No. H900330; 83 pp. Price: $79.00, prepaid)

Citation 356

<DIALOG File 32: (c) 1993 ASM International>
1767932 MA Number: 199301-16-0022
Title: Measurements of Decay Radioactivity of Long-Lived Isotopes.
Author: Kumar, A; Abdou, M A; Youssef, M Z; Ikeda, Y; Konno, C; Oyama, Y Kosako, K; Maekawa, F; Maekawa, H
Affiliation: University of California (Los Angeles)
Conference: Tenth Topical Meeting on the Technology of Fusion Energy,
Boston, Massachusetts, USA, 7-12 June 1992
Fusion Technology 21, (3), 2180-2189 May 1992 ISSN: 0748-1896
Country of Publication: USA
Journal Announcement: 9301
Document Type: Conference Paper
Language: ENGLISH
Abstract: Measurements of long-lived radioactivity are required to generate reliable data-base for qualifying fusion materials for reactor applications. However, long half lives necessitate intense 14 MeV neutron source, long irradiation time, long cooling time, and long counting time under low background. A 32 h 12 m long irradiation, at mean source neutron intensity of 1.13 x 10 exp 12 n/s, was carried out on a number of foil packages kept near rotating neutron target source at FNS under USDOE/JAERI collaborative program in June 1989. Four identical foil packages were kept at 0, 45, 90, and approx 115 deg to the d exp + beam. Each package contained foils of Ag, Al, Dy, Hf, exp 151 Eu. exp 153 Eu, Hf, Ho, iridium, Mo, Re, Tb, and tungsten. The objective was to measure decay gamma radioactivity from exp 108m Ag, exp 26 Al, exp 158 Tb, exp 152 Eu, exp 150 Eu, exp 94 Nb, exp 186m Re, exp 178m2 Hf, exp 192m Ir, and exp 166m Ho, among others. The half lives of these products range from 13.3y (exp 152 Eu) to 0.72My (exp 26 Al). These foils were interspersed with dosimetric foils of Nb and Zr. An estimated average fluence of approx 0.83 x 10 exp 15 n/cm exp 2 (range: 0.47-1.65.10 exp 15 n/cm exp 2) was obtained for the foil-package at zero degree. After cooling times ranging from 1.3-2 years, gamma -spectroscopy of some of these foils has been completed. Analysis of measurements, done on foil package at zero degree, has been carried out using four radioactivity codes, REAC-2, DKRICF, ACT4 (THIDA-2), and RACC. REAC-2 is the only code that has data for most of the observed products RACC has data for Al, Mo and W products only. Ratio of computed to experimentally measured activities varies from 4.10 exp --5 -377. Major update of all four cross-section libraries is recommended as waste classification of many fusion specific materials is likely to change dramatically. Graphs. 26 ref.
Descriptors: conference paper; transition metals-- irradiation radioactivity; half life; radioactive waste; nuclear reactor components-- materials selection; nuclear cross sections; nuclear fusion; nuclear fusion reactors
Section Headings: 16 (irradiation effects)

Citation 357

<DIALOG File 32: (c) 1993 ASM International>
1706245 MA Number: 91-610360
Title: Characterization of Long-Lived Activation Products in Spent Fuel Assembly Hardware and Reactor Pressure Vessel Steel.
Author: Robertson, D E; Thomas, C W; Wynhoff, N L; Hetzer, D C
Affiliation: Pacific Northwest Laboratory
Conference: 16th Water Reactor Safety Information Meeting, Gaithersburg,
Maryland, USA, 24-27 Oct. 1988
Nuclear Engineering and Design 118, (3), 463-486 Apr. 1990 ISSN:
0029-5493
Journal Announcement: 9106
Document Type: ARTICLE
Language: ENGLISH
Abstract: Extensive measurements have provided the basis for evaluating the radionuclide concentrations, distributions, inventories, waste classification, and disposal options for activated metal wastes generated during reactor decommissioning. A variety of neutron-activated metal specimens associated with spent fuel assembly hardware from commercial nuclear power stations and pressure vessel steel from the decommissioned Gundremmingen KRB-A reactor were subjected to detailed radionuclide and stable element analyses. Emphasis was placed on the long-lived radionuclides specified in 10CFR61, including exp 54 Mn, exp 55 Fe, exp 60 Co, exp 59 Ni, exp 63 Ni and exp 94 Nb. In addition, it was discovered that much higher concentrations of exp 93m Nb were present in activated Inconel and stainless steel than earlier calculations had predicted. The concentrations of exp 63 Ni, exp 59 Ni, and exp 94 Nb in Inconel components and exp 63 Ni and exp 59 Ni in stainless steel components were often much greater than the Class C limit, indicating that these materials would have to be disposed of as high level waste. The accuracy of calculational methods for predicting radionuclide concentrations in activated metal wastes was evaluated by conducting blind comparisons of empirical vs.

predicted values. This comparison showed that good agreements were achieved for the fueled regions of the fuel assemblies, but at the tops and bottoms of the assemblies the calculated values were, in some cases, significantly in error. The agreement between measured vs. predicted radionuclide concentrations for the Gundremmingen pressure vessel steel was good. These evaluations have provided confidence in the calculational methods and have identified problem areas where improvements are warranted. Graphs. 6 ref.--AA
Descriptors: nuclear reactor components-- chemical analysis; stainless steels-- chemical analysis; zirconium base alloys-- chemical analysis nickel base alloys-- chemical analysis; superalloys-- chemical analysis radioactive waste-- chemical analysis; radioisotopes; nuclear fuels; waste disposal
Alloy Index(Identifier): Inconel-- NI, SP/ Zircaloy-- ZR
Section Headings: 61 (Engineeering components and structures)

Citation 358

<DIALOG File 117: >
629457 W91-06132
Title: Nuclear Regulatory Commission Regulations and Experience with Solidification/Stabilization Technology
Author: Jungling, T.; Greeves, J.
Corporate Affiliation: Nuclear Regulatory Commission, Washington, DC. Low-Level Waste Licensing Branch.
IN: Environmental Aspects of Stabilization and Solidification of Hazardous and Radioactive Wastes. STP 1033. ASTM, Philadelphia, PA, 1989. p 77-82, 2 tab.,
Journal Announcement: SWRA2407
Abstract: Two important areas in the US Nuclear Regulatory Commission regulations for low-level waste management, 10 CFR Part 61, involve the requirements for waste classification and waste form. The waste classification system establishes three categories of wastes acceptable for near surface disposal. These categories are determined by the concentrations of nuclides important for disposal. Class A wastes have low concentrations and need only meet minimum waste form requirements. Class B and C wastes have higher concentrations and are required to have stability to minimize disposal trench subsidence effects. This rule established performance objectives for the land disposal of radioactive waste, minimum technical requirements for a near-surface disposal facility, and the licensing procedures NRC will follow in licensing new disposal capacity for low-level radioactive waste. The performance objectives established in 10 CFR Part 61 are: (1) protection of the general population from releases of radioactivity; (2) protection of individuals from inadvertent intrusion; and (3) protection of individuals during operations. (See also W91-06124) (Author's abstract)
Descriptors: *nuclear regulatory commission; *radioactive waste disposal *regulations; *waste disposal; *waste solidification; classification radioactive wastes; waste management
Section Heading Codes: 5E (Water Quality Management and Protection--Ultimate Disposal of Wastes); 6E (Water Resources Planning--Water Law and Institutions)

Citation 359

<DIALOG File 117: >
589263 W88-02640
Title: Hazardous Waste Management Handbook
Author: Butterworths, London, England. 1985. 305 p. Edited by Andrew Porteous.,
Journal Announcement: SWRA2104
Abstract: Hazardous wastes management in the UK has had a checkered history. Hazardous wastes were handled for many years on an 'out of sight, out of mind' principle until a few well published instances of indiscriminate or illegal disposal brought the subject into the public domain. Regulations, rules, codes of practice proliferated along with local government staff who were suddenly confronted with a quantum jump in technology and practice compared to what had gone before. A guide to these requirements is provided in this text. The text's main starting point is to quantify the nature of industrial wastes in the UK. Waste classifications, properties, hazards and methods of disposal available are also covered. This is followed by a review of the development of hazardous wastes legislation, the statutory duties of a waste disposal authority, site licensing, transport of hazardous wastes, and health and safety at work. Further chapters discuss: leachate production control and treatment; solidification processes; water quality and analytical techniques; alternatives to landfill; recycling, reclamation and waste reduction through process design; and radioactive waste disposal. (See W88-02641 thru W88-02649) (Lantz-PTT)
Descriptors: *hazardous wastes; *waste disposal; *waste treatment *waste management; leachates; legal aspects; solidification; landfills water quality; recycling; radioactive wastes
Section Heading Codes: 5D (Water Quality Management and Protection--Waste Treatment Processes); 5E (Water Quality Management and Protection--Ultimate Disposal of Wastes)

Citation 360

<DIALOG File 136: >
591334
Notice: NRC makes available proposed Staff Technical Position on Radioactive Waste Classification revision, Technical Position on Concentration Averaging & Encapsulation. Comment deadline Aug 26 1992.
Date: Source: 57 126 Page: 29105

JUNE 30, 1992
Descriptors: environment-nuclear waste mgmt (2616); utilities-nuclear facilities (2510)

Citation 361

<DIALOG File 136: >
189082
Rule: 10 CFR Parts 20 & 61
Notice: NRC Low-Level Waste Licensing Branch, Division of Waste Mgmt, publishes technical position papers to provide guidance to licensees re methods considered acceptable for implementing the waste classification & form rqmts contained in "Licensing Rqmts for Land Disposal of Radioactive Waste."
NPRM Dec 27 1982, 47 FR 57446. CONTACT: Paul Lohaus (301) 427-4500.
Source: 48 110 Page: 26295
Date: JUNE 7, 1983
Descriptors: environment-nuclear waste mgmt (2616)

Citation 362

<DIALOG File 15: (c) 1993 UMI/Data Courier>
00646206 DIALOG FILE 15 ABI/INFORM 92-61146
Title: Naturally Occurring Radioactive Material (NORM): New Challenge from Old Earth
Author: Steingraber, Buck
Journal: Oil & Gas Investor Supplement PP: 6-9 Oct 1992 ISSN: 0744-5881
JRNL CODE: OGI
DOC TYPE: Journal article LANGUAGE: English LENGTH: 4 Pages
AVAILABILITY: Fulltext online. Photocopy available from ABI/INFORM 14983.00
WORD COUNT: 2476
ABSTRACT: The tissues of all living organisms contain naturally occurring radioactive material (NORM). The American Petroleum Institute in 1986 formed an ad hoc committee to investigate the NORM phenomenon in the oil and gas industry and to determine what practices, if any, needed to be implemented to address the potential environmental, health, or safety concerns. Gamma radiation due to NORM's presence in oil and gas equipment can be detected by external surveys using portable, hand-held scintillation devices. Oil and gas operators in states without regulations applicable to NORM are encouraged to: 1. survey all existing operations to define where NORM is present and determine to what dose levels workers could potentially be exposed, 2. avoid releasing for unrestricted use any NORM-contaminated equipment reading higher than 50 microrems per hour at any accessible point of measurement, and 3. obtain approval from the appropriate regulatory agency for disposal of NORM wastes prior to implementing the disposal plan.
GEOGRAPHIC NAMES: US
DESCRIPTORS: radioactivity; petroleum industry; natural gas industry; hazar dous substances; environmental regulations; procedures; waste disposal classification codes: 8510 (cn=petroleum industry); 9190 (cn=united states); 1540 (cn=pollution control); 4310 (cn=regulation)

Citation 363

<DIALOG File 63: >
326219 DA
TITLE: Transportation of radioactive wastes from nuclear fuel cycles
CORPORATE SOURCE: Sandia Laboratories; P.O. Box 5800; Albuquerque; NM; 8711 5; Department of Energy; 1000 Independence Avenue, SW; Washington; DC 20585
Pag: 35p
PUBLICATION DATE: 790900 PUBLICATION YEAR: 1979
LANGUAGE: English SUBFILE: RRIS; HRIS
SOURCE ACCESSION NUMBER: u8022
AVAILABILITY: National Technical Information Service; 5285 Port Royal Road; Springfield; VA; 22161
ORDER NUMBER: SAND-79-1886C
SUPPLEMENTAL NOTES: International nuclear fuel cycle evaluation conference, Vienna, Austria, 17 Sep 1979.
FUNDING TYPE: Contract
CONTRACT/GRANT NUMBER: EY-76-C-04-0789
ABSTRACT: This paper discusses current and foreseen radioactive waste transportation systems as they apply to the INFCE Working Group 7 study. The types of wastes considered include spent fuel, which is treated as a waste in once-through fuel cycles; high-, medium-, and low-level waste; and gaseous waste. Regulatory classification of waste quantities and containers applicable to these classifications are discussed. Radioactive wastes are presently being transported in a safe and satisfactory manner. None of the INFCE candidate fuel cycles pose any extraordinary problems to future radioactive waste transportation and such transportation will not constitute a decisive factor in the choice of a preferred fuel cycle. (ERA citation 05:000252)
DATA SOURCE: National Technical Information Service
REPORT NUMBER: CONF-790957-1
DESCRIPTORS: *radioactive wastes; classification; containers; regulation; spent fuel casks; spent fuels; transportation systems; waste transportation; radioactive materials; waste materials; transportation planning;

hazardous materials; shipping containers; physical distribution; safety; radioactive materials; waste disposal; transportation systems; regulation; classification; containers; safety
SUBJECT HEADING: R22; H51, Safety; I83, accidents and the human factor

Citation 364

<DIALOG File 77: (c) 1993 Cambridge Sci Abs>
1532592
Supplier Accession Number: 83032592 V11N6
Title: Waste classification system for low-level radioactive wastes
Author: Wickham, L.E.; Rope, S.K.
Corporate Affiliation: EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415
Scientific Basis for Nuclear Waste Management, 6th International
Symposium 8245021 Boston, MA 1-4 Nov 82
Materials Research Society
Proceedings in: "Scientific Basis for Nuclear Waste Management VI", 1983, Elsevier Scientific Publishing Co., Inc., 52 Vanderbilt Ave., New York, NY 10017, USA, ISSN 0272-9172; 792 pages
Languages: ENGLISH
Descriptors: power engineering; geoscience
Section Heading: power engineering; geoscience
Section Class Codes: 8500; 5500

Citation 365

<DIALOG File 101: (COPR. 1993 CIS)>
422762 CIS ACCESSION NUMBER: 84-H361-64 NUMBER OF ANALYTICS: 8
TITLE: DOE's FY85 Budget.
SOURCE: Feb. 9, 22, 28, 1984 CONGRESSIONAL SESSION: 98-2 vi+838 p +
FICHE: 11 ITEM NO: 1019-A; 1019-B
SUPERINTENDENT OF DOCUMENTS CLASS NUMBER: Y4.En2/3:98-127
MONTHLY CATALOG NUMBER: 84-24652. LC CARD NUMBER: 84-603684
DOCUMENT TYPE: HEARING
JOURNAL ANNOUNCEMENT: 8412
ABSTRACT: Committee Serial No. 98-127. Hearings before the Subcom on Energy Conservation and Power to consider DOE authorization request for FY85. Feb. 22 hearing reviews DOE implementation of radioactive waste disposal programs under the Nuclear Waste Policy Act (NWPA) of 1982, focusing on provisions requiring development of repository site selection guidelines and a plan for transfer of commercial nuclear waste to DOE (waste acceptance). Hearing on Feb. 9 was held with the Subcom on Fossil and Synthetic Fuels. Includes submitted statements (p. 808-838).
DESCRIPTORS: subcom on energy conservation and power. House; subcom on fossil and synthetic fuels. House; department of energy; energy resources ; nuclear power plants; planning; nuclear regulation; public administration; nuclear waste policy act; radioactive waste disposal;
ANALYTIC RECORD ACCESSION NUMBER: 0422762 CIS ACCESSION NUMBER: 84-H361-64.6
DATE: Feb. 22, 1984. PAGE(S):p. 388-663.
WITNESSES: Lawrence, Michael J. Act Dir, Office of Civilian Radioactive Waste Mgmt, DOE.; Cotton, Thomas A. Dir, Commercial High-Level Radioactive Waste Mgmt Study, OTA.
ABSTRACT: Overview of DOE proposed FY85 commercial nuclear waste management and spent fuel storage budget and programs; review of DOE accomplishments relating to NWPA implementation; details of geologic repository selection and development programs and plans for an experimental repository Test and Evaluation Facility.

Highlights of OTA assessment of DOE nuclear waste acceptance plan and schedule, with recommendations (summary, p. 444-446); explanation of DOE reorganization initiatives, including plans for the Office of Civilian Radioactive Waste Management; (legal memo, p. 514-517); nature of DOE-EPA interaction regarding radioactive wastes management and regulation (memo of understanding, p. 544-550).

Clarification of DOE efforts to evaluate potential waste repository sites and conduct environmental assessments; description of waste container construction standards and R&D activities; status of programs relating to defense wastes and byproducts management, including waste acceptance criteria for the Waste Isolation Pilot Plant facility in New Mexico. Elaboration on radioactive waste classifications and environmental standards applicable under DOE Draft Order No. 5820; aspects of DOE programs at Hanford, Wash. and Savannah River nuclear sites; viewed adequacy of DOE waste repository site selection guidelines and test procedures.
a. DOE, nuclear waste disposal contracts, FY83-FY85, lists of contractors and subcontractors (p. 464-509).
b. DOE, ''FY83 Geologic Repository Siting Accomplishments'', with maps (p. 607-620).
c. DOE, NRC Jan. ll, 1984 public meeting on DOE repository site guidelines, comment on meeting issues, Feb. 1, 1984 (p. 625-638).
d. German Federal Minister of the Interior, West Germany ''Safety Criteria for the Final Disposal of Radioactive Wastes in a Mine'' German Fed Register announcement of Reactor Safety Commission recommendations, Jan. 5 1983 (p. 640-653).

DESCRIPTORS: office of technology assessment; demonstration and pilot projects; nuclear research; national defense; environmental regulation environmental protection agency; federal interagency relations; savannah river nuclear facility; government contracts and procurement; nuclear regulatory commission; citizen participation;

germany, west; mines and mining; german reactor safety commission, west germany; waste isolation pilot plant, n.Mex.; New mexico; geology; government reorganization office of civilian radioactive waste management; industrial standards environmental research; washington state; hanford, wash.

Citation 366

<DIALOG File 108: >
1415625 N86-10959
Title: Impact of long-lived radionuclides on waste classification for fusion
Author: MANINGER, R. C.
Corporate Affiliation: California Univ., Livermore. Lawrence Livermore Lab.
Publication Date: May 1985 13P.
Presentation Note: Presented at the Ann. Meeting of the Am. Nucl. Soc.,
Boston, 9 Jun. 1985
Report No.: DE85-013205; UCRL-91885; CONF-850610-30
Contract No.: W-7405-ENG-48
Language: English
Country of Origin: United States
Country of Publication: United States
Document Type: CONFERENCE PAPER
Documents available from AIAA Technical Library
Other Availability: NTIS HC A02/MF A01
Journal Announcement: STAR8601
Abstract: A major goal for commercial applications of fusion reactors is tominimize radioactive wastes and to dispose of them by near surface burial.There currently are no regulations specifically applicable to fusion wastesbut those in force for fission wastes furnish a framework for expected fusion regulations. It is recommended that all nuclides with half lives greater than five years be assigned concentration limits as done in 10 CFR 61 for fission wastes. Approximate limits for all the significant long halflife sources of gamma radiation in the currently known periodic table aregiven. In the absence of working fusion reactors, computer models must beused to estimate the expected actual concentrations of radioactive nuclides. These estimates are needed to guide design parameters to achieve minimum radioactivity in fusion reactors. It is believed that the computer models and nuclear libraries must be much more comprehensive than ordinarily used today to do activation calculations. (DOE)
Source of Abstract/Subfile:DOE
Descriptors: *computerized simulation;* fusionreactors; *radioactive isotopes; *radioactive wastes; impact fusion; mathematical models; nuclear reactions; parameterization; radiation hazards; waste disposal
Subject Classification:7573Nuclear & High-Energy Physics (1975-)

Citation 367

<DIALOG File 155: >
08530681 93240681
Title: Disposal of low-level radioactive waste. Problems and implications for physicians.
Author: Hendee, WR
Office of Research and Technology, Medical College of Wisconsin, Milwaukee 53226.
JAMA (UNITED STATES) May 12 1993, 269 (18) p2403-6, ISSN 0098-7484
Journal Code: KFR
Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9307
Subfile: AIM; INDEX MEDICUS
Descriptors: *physician's role; *policy making; *radioactive waste--legislation and jurisprudence--lj; *refuse disposal --legislation andjurisprudence--lj; government agencies; radioactive waste--classification--cl; refuse disposal--methods--mt; refuse disposal--standards--st; socialcontrol, formal; transportation--standards--st; united states cas registry no.: 0 (Radioactive waste)

Citation 368

<DIALOG File 161: >
0108341 NIOSH-00146869
EC Proposals For Dangerous Substances
Walker, M. J.
Chemistry in Britain, Vol. 20, No. 8, pages 724-725 August 1984
Abstract: European Community proposed regulations for classifying, packing, andlabeling dangerous substances are discussed. It is noted that theregulations will come into effect on January 1, 1986. The directives willspecify requirements for hazardous substances when supplied for commercial,industrial, and transportation uses. They will not apply to shop or retailoutlets. Only a small proportion of hazardous substances is subject tostatutory control for packing and labeling. For example, there are noregulations dealing with toxic substances, liquefied petroleum gas, orpackaged hazardous wastes. Classification of the directives is discussed

asthey relate to solvents, paints, pesticides, and toxic and dangerouswastes. Application of the directives to packaging and labeling isconsidered. Enforcement of the directives is discussed. Civil liability ofthe regulations is considered. A European Community directive is binding onUnited Kingdom courts regardless of whether it is supported by legislation.
DESCRIPTORS: standards; regulations; occupational exposure; health car; occupational hazards; health care personnel; health hazards; radiationsources; radioactive materials; occupational accidents; legislation

Citation 369

<DIALOG File 266: >
0032071 DIALOG FILE NO. 265/266 FEDERAL RESEARCH IN PROGRESS
IDENTIFYING NO.: 30851 AGENCY CODE: ENRGY
Title: Recovery of plutonium and treatment of solid wastes containing alphaemittes
PRINCIPAL INVESTIGATOR: Anders, P.
ADDRESS: Hanau (Germany, F.R.)
PERFORMING ORG.: Alpha Chemie und Metallurgie GmbH (ALKEM), Hanau (Germany)*Postfach 110069, Rodenbacher Chaussee*D-6450 Hanau 11
DATES: 800701 TO 821231
SUMMARY: Within the scope of the total program, a waste-treatment conceptis to be realized. In the first stage of this scheme, three projects willbe dealt with till the licence is obtained (phase 1): Waste organization: Systematic collection of waste data, waste classification, determination ofPu content, substitution of plastics containing halogens, measures forwaste minimization. Cleaning processes for recovery of fissile materialfrom solid crude wastes: Testing of different cleaning processes andcleaning agents. Processing and recycling of cleaning solutions. Ultimateconditioning of processed crude wastes: Optimizing of a waste/ cementproduct, design work for the construction of an ultimate conditioning plant to be tested with original wastes.
DESCRIPTORS: alpha-bearing wastes/radioactive waste management; plutonium/recycling; solid wastes; plutonium; recycling; washing; solutions; chemical analysis; information systems

Citation 370

<DIALOG File 636: (COPR. 1991 PREDICASTS INC)>
01729109 DIALOG FILE 636: PTS NEWSLETTER DATABASE
DOE FORGES COMPREHENSIVE WASTE MANAGEMENT ORDER
FUSION POWER REPORT December 21, 1992 V. 13 NO. 12
ISSN: 0276-2919 WORD COUNT: 800
PUBLISHER: Business Publishers, Inc.

The Department of Energy plans to consolidate all waste management requirements for the Office of Environmental Restoration and Waste Management (EM) under a revised version of its radioactive waste management order (DOE Order 5820.2A). Work on the new order should be complete in about two years.

The new order will cover all categories of wastes managed by EM, including radioactive, hazardous and sanitary wastes. It will not cover facility or site-specific information, said Greg Duggan from DOE's headquarters office of environmental restoration/waste management.

The current Order 5820.2A establishes policies, guidelines and minimum requirements by which DOE manages its radioactive and mixed waste and contaminated facilities. Since it was issued in September 1988, the department's waste management system has changed significantly.

Many changes resulted from the changing regulatory environment. New DOE policies have increased the emphasis on environmental, safety and health issues. Other changes stem from modifications in the missions and programs and in organizational responsibilities involving the Office of Defense Programs and the Office of Environmental Restoration and Waste Management. DOE headquarters has formed a steering committee of headquarters personnel from Defense Programs, Nuclear Energy, Energy Research and Occupational Safety and Health, to review and approve the revised order.

The order will be written by a technical working group which includes DOE field office personnel as team leaders and DOE contractor personnel on all each team.

Chapters in the revised order will include: Materials-Not-Classified-As-Was te, High-Level Waste, Transuranic Waste, Low-Level Waste, Mixed Waste, Performance Assessment, Hazardous Waste, Sanitary Waste and Mill Tailings.

The revision will be done in stages: preparation of an initial draft; DOE system-wide review, evaluation and resolution of comments; preparation of a final draft; a second DOE system-wide review and evaluation and resolution of a second set of comments; preparation of a concurrence copy; and final approval by headquarters.

The steering committee will review and approve a course of action on six categories of issues: organization and content of the order; waste classification and characterization; a performance objective/performance-as sessment-based waste management system; waste management operations documentation of waste management operations; and miscellaneous issues. Issues and recommendations to be addressed by the steering committee

include:

Development of a new source-based waste classification system to cover all DOE waste and materials-not-classified-as-waste, such as spent fuel and excess nuclear material.

The new system should assure no waste falls into more than one category, and each category will have an associated disposal strategy. The current classification system allows some waste, such as high-level and transuranic waste, to fall into more than one category and causes disposal of other wastes to be unacceptable, such as low-level radioactive waste with a radionuclide content preventing disposal.

More consideration to expanding the performance objective/performance assessment-based waste management system now used for LLW to mixed LLW and possibly other wastes.

Expanding the system to cover all waste types included in the new order, however, may be too complex. A related issue is development of treatment requirements to ensure the performance objectives will be met. Consideration is being given to including a section reflecting DOE's minimum waste treatment requirements before long-term storage or disposal.

A section on disposal site selection, operation and closure mirroring applicable Nuclear Regulatory Commission requirements.

General policy statements and general guidelines on DOE's safeguard and security orders (Series 5600), emergency management planning orders (Series 5500), transportation requirements for onsite and offsite shipments records management guidelines, with a reference to EPA's cradle-to-grave requirements; accountability; and compliance review.

Detailed quality assurance requirements for each waste classification.

A time limit and conflict resolution system for conflicts involving DOE and NRC, EPA, states or local government agencies. Initial attempts to resolve conflicts should be at the field office level.

Guidance on exempting NORM (naturally occurring radioactive material), fallout and consumer product radioactivity from DOE radioactive waste requirements. A brief discussion on criticality safety as it applies to waste management, and refer to other, more extensive, DOE criticality safety documents.

Discussion of DOE's policy on management of classified waste.

Discussion of guidelines for permissible concentration averaging.

A policy statement on the need for technology development, and definition of a process to identify waste management technology development needs.

References to EPA's mixed waste requirements. DOE guidelines should be included on how to manage mixed waste when there is a conflict between EPA and DOE's "as low as reasonably achievable" requirements for worker exposure.

Discussion of management of DOE-owned LLW waste equivalent to the NRC category of "Greater-Than-Class-C."

The revision should provide suggested disposal methods that may be acceptable if the site-specific performance assessment is done on GTCC-type waste. Also, another name should be used to differentiate DOE waste equivalent to GTCC from NRC's GTCC waste.

DOE plans to prepare a separate waste minimization order, which will cover recycling of commercial-type products such as paper and cans.

The determination of when a material is radioactive versus when it is considered clean is an important issue, however, it cannot be incorporated into the revision until a policy is developed, Duggan said.

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2945621
Turnkey services for testing, transporting, treatment and/or disposal, etc. Of miscellaneous mixed waste streams Sol M&H 92-002. Due 073192. Contact Point: J. D. King, 806/477-3848.
Title: qualified sources sought for turnkey services for testing, transporting, treatment and/or disposal of miscellaneous mixed waste streams.
Author: Mason & Hanger
Abstract: Silas Mason Co., Inc., (M&H) a prime contractor for the U.S. Department of Energy (DOE) at Pantex

Plant, located 20 miles northeast of Amarillo, Texas, will be issuing a Request for Proposal (RFP) for providing turnkey services for transportation, packaging, shredding, stabilization, incineration, characterization, decontamination and reporting. The contract may employ subcontractors for treatment and disposal of non-radioactive contaminated wastes resulting from treatment of the Pantex Plant mixed wastes. Only facilities approved by M&H may be used for processing treatment and/or disposal of any waste associated with waste received from the Pantex Plant. Respondents must be in possession of a fully licensed and permitted facilty capable of performing the mixed waste services listed herein. Final disposal effort, including the residue and/or debris, must be achieved by the first tier subcontractor or by the successful contractor. The successful contractor and all subcontractors shall transport, package, manage, store, treat, and dispose of all wastes covered by this contract in compliance with all applicable laws and regulations, including but not limited to 40 CFR, 49 CFR, 10 CFR, applicable state laws and regulations, local laws and regulations, and all state and federal permit conditions for facilities receiving the waste. All facilities to receive the wastes shall have valid state or federal permits which allow the facilities to receive, store, process, treat, and dispose of the wastes as applicable. M&H reserves the right to physically inspect and approve the contractor's facilities. The contractor will supply M&H with copies of permits and any other documents regarding federal or state authorization for the contractor's facility to receive, store, process, and treat radioactive contaminated wastes, mixed wastes, and hazardous wastes. M&H requests the ability to temporarily stage waste (on any new mixed waste streams not currently included in the contract) at the contracting facility pending procurement of treatment capabilities for the waste. The successful contractor shall treat Pantex generated radioactive/mixed waste to meet Nevada Test Site Defense (NTS) and Land Disposal 40 CFR, 268 for Land Disposal Restrictions (LDR). The treatment performed by the successful contractor shall either eliminate the mixed waste classification or shall meet the LDR treatment standard such that the waste may be land disposed. Applicable documents will be NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements. The mixed waste streams descriptions currently include: solvent contaminated Kimpwipes, gloves, anti-c protective clothing materials; metal contaminated residues; solvents contaminated with radioactivity; Rad contaminated aqueous liquids or nonhazardous solvents; scintillation vials. Waste stream characterization data sheets for these waste streams will be provided in the bid package. The quantities of wastes requiring treatment will vary on a month-by-month basis. This contract will be for a period of one (1) year commencing on the date of issue and expiring one (1) year later, with an option to renew up to a total of four (4) additional years. Request for Proposal will be available approximately August 3, 1992. This is a request for an expression of interest only. Responses shall be received by July 31, 1992 and directed to the attention of J. D. King, Procurement Department. This is not an RFP. (174)

SPONSOR: Mason & Hanger - Silas Mason Co. Inc., P.O. Box 30020, Amarillo, TX 79177-0001
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03412946 EDB-92-175703
Title: State perspective on how clean is clean enough when radioactive materials are involved
Author(s): Bailey, E.D. (California Dept. of Health Services, Sacramento (United States))
Conference Title: American Nuclear Society annual meeting
Conference Location: Boston, MA (United States) Conference Date: 7-12 Jun 1992
Source: Transactions of the American Nuclear Society (United States) v 65. Coden: TANSA ISSN: 0003-018X
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Abstract: The question of how much radioactive material can be left behind by a user of radioactive materials or how much radioactive material can be taken to a local sanitary landfill is not so much a scientific or technical question as it is a societal, philosophical, and, therefore, political issue. The issues are mired in the debates about nuclear power, nuclear weapons, big business, and distrust of government. Scientific and regulatory bodies add to the general public's true fears, concerns, uncertainties, and mistrust of radiation and things radioactive when they fail to act in a concise, logical, and at least coordinated manner. The bifurcation of standard setting responsibility at the federal level between the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Environmental Protection Agency and the agreement state system of regulating radioactive materials all add to the public's confusion and anxiety. The purpose of this paper is to point out from the viewpoint of a state regulatory agency problems that are seen as stumbling blocks to the implementation and acceptance of a below-regulatory-concern (BRC) policy.
Major Descriptors: *low-level radioactive wastes -- classification; *low-level radioactive wastes radioactive waste management

Descriptors: Implementation; nuclear power; public health; public opinion; public policy; safety; sanitary landfills; US DOE; US EPA; US NRC
Broader Terms: management; materials; national organizations; power; radioactive materials; radioactive wastes; waste disposal; waste management; wastes
Subject Categories: 054000* -- Nuclear Fuels -- Health & Safety 052000 -- Nuclear Fuels -- Waste Management
INIS Subject Categories: E2300* -- Reactor Fuels E5000 -- Waste Management