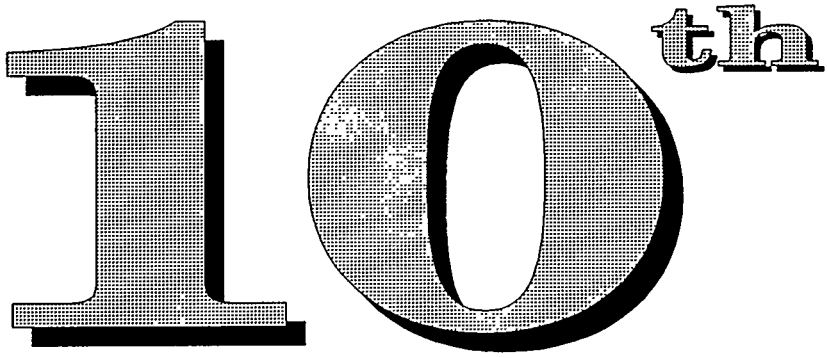
CIRRPC

Committee on Interagency Radiation Research and Policy Coordination



ANNIVERSARY REPORT

June 1994

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FROM THE CHAIR

Ten years ago, on April 9, 1984, the Science Advisor to the President, and Director of the Office of Science and Technology Policy, established the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC) to meet the need for an interagency committee to address Congressionally mandated and agency-identified issues related to radiation research and policy. CIRRPC replaced the Committee on Interagency Radiation Policy, a committee of the Federal Coordinating Council for Science, Engineering and Technology, and assumed the responsibilities of the Interagency Radiation Research Committee and the Radiation Policy Council, whose charters had expired. Since then, CIRRPC has been recognized as an effective and respected mechanism for coordinating radiation policy among Federal agencies and as an efficient coordinator and evaluator of Federal efforts on designated radiation research projects.

The first CIRRPC Policy Meeting was held on May 25, 1984. The first Science Panel meeting on June 12, 1984 dealt with the Veterans Administration's request for an evaluation of the scientific merit of conducting an epidemiological study to assess the health effects of radiation exposure among veterans exposed during military operations in Japan or at nuclear weapons tests. Another early CIRRPC action was a review of the scientific basis for radioepidemiological tables that associated certain cancers with levels of radiation exposure. The tables were developed by the National Institutes of Health in response to a Congressional mandate under the Orphan Drug Act of January 4, 1983 (P.L.97-414).

In the last 10 years, CIRRPC has established various Policy and Science Subpanels to undertake the oftentimes difficult task of resolving and coordinating agency policies and responses to issues dealing with radiation. These subpanels addressed such issues as the metrication of radiation units, the policy impact of the radioepidemiological tables, naturally occurring and accelerator-produced radioactive materials, radon protection and health effects, predisaster planning for human health effects research, and ionizing radiation risk assessment. These subpanels and their work represent CIRRPC's continuing effort to seek a common position on issues of national significance and interest.

CIRRPC's activities have significantly affected the radiation community, the Federal government, and the public. Examples of CIRRPC's past work include:

- a review of the probability of causation tables to provide member agencies guidance in the adjudication of claims of injury due to exposures to ionizing radiation;

- a compendium of legal and technical facts on major U.S. radiation protection standards and guides, which not only resulted in a one-volume source of information on standards and guides, but also clearly revealed the degree, or lack, of consistency among them;

- a review of a report by the Scientific Committee on Problems of the Environment (SCOPE) that examined the ecological and agricultural effects of nuclear war;

- a report on the Federal radiation research agenda that gave member agencies an overview of the Federal government's radiation research program;

- sponsorship of a report by the National Council on Radiation Protection and Measurements on the exposures to (and sources of) ionizing radiation among the U.S. population;

- a review of the report, *Health Risks of Radon and other Internally Deposited Alpha-Emitters (BEIR* IV)*, to determine whether agencies could agree on values for radiation risks, as provided in fundamental documents; (CIRRPC concurred with the Science Panel on specific values, as given in BEIR IV, which could be used by all Federal agencies. CIRRPC also agreed that future reviews should be conducted on subsequent reports.) and

- support for the National Academy of Sciences/National Research Council report, *Health Effects of Exposure to Low Levels of Ionizing Radiation* (BEIR V), that updated earlier

* (Committee on the) Biological Effects of Ionizing Radiations.

radiation risk estimates that were primarily derived from Japanese atomic bomb survivors and other exposed populations.

More recently, CIRRPC also:

- supported conclusions by the Science Panel and a Policy subpanel that emphasized the Federal agencies' role in implementing a national program on radon, which is one of the topics recognized by CIRRPC as an issue of multiagency concern;

- commissioned an independent, multidisciplinary panel of experts to evaluate the reported health effects of exposures to electromagnetic fields, especially reports of carcinogenesis and reproductive and neurophysiological effects; and

- reviewed agencies' draft reports on scientific and regulatory issues.

Although CIRRPC has covered a broad range of topics during the last 10 years, there are still many issues that require CIRRPC's involvement. Among these are:

- the existence of overlapping Federal regulations to control radiation exposures;

- risk perspectives on waste disposal sites;

- the assessment of health risks (primarily cancer) at the low doses and dose rates actually experienced by workers and the public (possibly including the establishment of guidelines for the conduct of epidemiological studies resulting from dose-reconstruction activities at nuclear facilities); and

- the development of information on the benefits to society of some radiation sources, relative to their more highlighted risks.

While other committees, in one form or another, have been established since the late 1950s to function in a similar capacity, CIRRPC has been uniquely successful because of its ability to serve as a neutral forum where agencies can exchange information on policy and research activities, plans, and ideas. In

meeting its responsibilities, CIRRPC also has sought guidance from various professionals, organizations, and institutions to ensure that its findings and recommendations are founded on good science and sound policy practices. CIRRPC has also proven the merit of the multiagency funding approach as a way of maintaining interest and fostering a strong cooperative spirit among its members and making CIRRPC responsive to their needs and concerns.

CIRRPC's activities and issues of concern may have varied since 1984, but two things have remained constant: the enthusiastic support of its member agencies and the high quality of work offered by their representatives. This support, cooperation, and dedicated service have been the primary source of CIRRPC's strength and its guarantee of success in a future filled with new and meaningful challenges.

Alvin L. Young, Ph.D.
Chairman

INTRODUCTION

The Committee on Interagency Radiation Research and Policy Coordination (CIRRPC) was chartered on April 9, 1984 through the Federal Coordinating Council for Science, Engineering and Technology.

In 1994, with President William J. Clinton's creation of the National Science and Technology Council (NSTC), CIRRPC became a subcommittee under the NSTC's Committee on Health, Safety and Food Research and Development.

CIRRPC complements the radiation research and policy activities of its member agencies. Its function is not to change or diminish the statutory authority or responsibility of any agency or department. Rather, it acts as a coordinator and evaluator of the Federal research effort on radiation issues. CIRRPC also coordinates radiation policy among agencies, resolves policy conflicts, and advises on the formulation of broad radiation policy. It serves as a neutral forum where its member agencies can discuss and resolve radiation issues to best serve national interests.

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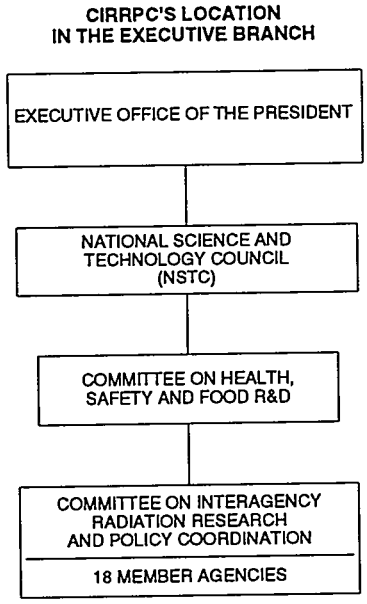
CIRRPC's 18 member agencies are each represented by subcabinet or senior policy representatives. These officials not only represent their agencies on CIRRPC and its policy subpanels, but also review and approve reports developed by CIRRPC's subpanels. A Chair, a Vice Chair, and an Executive Secretary serve as the officers of CIRRPC.



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CIRRPC's Science Panel is composed of senior scientific representatives from 15 member agencies with interest in technical and scientific issues. The Science Panel conducts monthly meetings to provide opportunities not only for discussions on radiation and scientific issues of mutual interest, but also for briefings on radiation activities, including research programs, and for reviews of reports developed by the science subpanels.

CIRRPC MEMBER AGENCIES

Department of Agriculture
Department of Commerce
Department of Defense
Department of Energy
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
Department of Justice
Department of Labor
Department of State
Department of Transportation
Department of Veterans Affairs
Environmental Protection Agency
Federal Emergency Management Agency
National Aeronautics and Space Administration
National Science Foundation
Nuclear Regulatory Commission
Office of Management and Budget

CIRRPC's officers and the Science Panel's Chair, Vice Chair, and Executive Secretary make up the CIRRPC Executive Committee, which is responsible for overall planning and the general management of CIRRPC's programs and resources. The Technical Assistance Director from the Department of Energy (DOE) also participates in the deliberations and activities of the Executive Committee. CIRRPC's operations are governed by procedures set forth in the *Report of the Ad Hoc Group on CIRRPC Procedures* (1991).

The technical and administrative support required for CIRRPC's operation is provided through a DOE contract with Oak Ridge Associated Universities (ORAU), a not-for-profit corporation and consortium of 82 doctoral-granting universities and colleges. Funding for this contract is provided by CIRRPC's member agencies. The CIRRPC Executive Committee reviews ORAU's support activities and operations and the general progress of approved projects.

CIRRPC EXECUTIVE COMMITTEE

Dr. Alvin L. Young (USDA)
Chairman

Mr. Robert M. Bernero (NRC)
Vice Chairman

Mr. Robert L. Brittigan (DOD)
Executive Secretary

Dr. Randall S. Caswell (DOC)
Chairman, Science Panel

Dr. Marvin Rosenstein (HHS)
Vice Chairman, Science Panel

Dr. Jerome S. Puskin (EPA)
Executive Secretary, Science Panel

Mr. Thaddeus J. Dobry (DOE)
Technical Assistance Director

Issues of interest to CIRRPC members include:

- ensuring a sound scientific basis for radiation protection standards;
- updating health risk estimates, including their accompanying uncertainties;
- building consensus among Federal agencies on radiation policies and research needs;
- facilitating improvements in public perceptions of radiation exposures and radioactivity;
- reviewing and facilitating consistency in proposed regulatory requirements; and
- reviewing assessments of radiation risk from specific sources at doses and dose rates experienced by workers and the public, such as routine releases of radioactivity from operating facilities and potential releases from waste disposal sites.

1993-94 POLICY SUBPANELS AND WORKING GROUPS

- Subpanel on Public Education
- Subpanel on Recommendations on Radiological Protection

1993-94 SCIENCE SUBPANELS AND WORKING GROUPS

- Subpanel on Scientific Basis for Radiation Protection Standards
- Subpanel on High-Linear Energy Transfer Radiation
- Subpanel on the Use of BEIR V and UNSCEAR 1988 in Risk Assessment
- Subpanel on Occupational Radiation Protection Research
- Subpanel on the Health Effects of Electromagnetic Fields
- Subpanel on a Fluence-Based System of Radiation Risk Assessment

CIRRPC takes up issues as a direct result of agency requests, in response to mutual interest among its members, or at the request of OSTP. Policy and Science Subpanels are established to address specific issues and to produce reports outlining their findings and recommendations. In 1993-94 eight subpanels and working groups dealt with such issues as the health effects of electromagnetic fields, a fluence-based system of radiation risk assessment, recommendations on radiological protection, and high linear-energy transfer (LET) radiation.

Aside from producing and sponsoring science and policy reports, CIRRPC also coordinated a number of interagency reviews of draft reports developed by member agencies.

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CIRRPC interacts with various national and international organizations to exchange scientific and policy information on radiation protection recommendations and research. These organizations have included the National Council on Radiation Protection and Measurements (NCRP), the International Commission on Radiological Protection (ICRP), the National Academy of Sciences, the Conference of Radiation Control Program Directors, the United Kingdom's National Radiological Protection Board, the European Commission, the Health Physics Society, national laboratories, and public interest and industry groups.

CIRRPC ACTIVITIES

Program Highlights

In 1993 CIRRPC:

- established a science subpanel to consider the use of particle fluence in radiation risk assessment (see p. 12);
- devoted its July 1993 policy meeting to a discussion of issues related to depleted uranium, in response to concerns over illnesses among veterans of the Persian Gulf War (see p. 6);
- published Science Panel Report No. 9, *Use of BEIR[1] V and UNSCEAR[2] 1988 in Radiation Risk Assessment: Lifetime Total Cancer Mortality Risk Estimates at Low Doses and Low Dose Rates for Low-LET Radiation* (see p. 10);
- reviewed and approved for publication *Research Priorities for Occupational Radiation Protection*, a report of the Subpanel on Occupational Radiation Protection Research (see p. 10);
- conducted briefings on the Federal agencies' radon and radiation research activities and priorities (see p. 6); and
- met with the Director and the Secretary of the United Kingdom's National Radiological Protection Board to exchange information on U.S. and European radiological protection issues.

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In 1994 the efforts of other subpanels resulted in the completion of final drafts of the following reports:

- *Neutron Quality Factor*, by the working group of the Subpanel on the Scientific Basis for Radiation Protection Standards;
- *Biological Effectiveness of Neutrons: Research Needs*, by the Task Group of the Subpanel on High-LET Radiation;
- *Balancing Radiation Benefits and Risks: The Needs of an Informed Public*, by the Subpanel on Public Education; and
- *Proceedings of the Workshop on Internal Dosimetry*, by the Subpanel on Occupational Radiation Protection Research.

[1] (Committee on the) Biological Effects of Ionizing Radiations.

[2] United Nations Scientific Committee on the Effects of Atomic Radiation.

Work also progressed on the CIRRPC-sponsored NCRP reports on collective dose and radon.

CIRRPC Policy Meeting on Depleted Uranium

The July 8, 1993 CIRRPC Policy Meeting focused on health concerns over exposures to depleted uranium (DU), particularly exposures to munitions used in the Persian Gulf War.

Interest in this issue was generated by reported illnesses among Desert Storm veterans exposed to DU and other environmental agents. Possible connections between health problems and exposure to DU prompted the U.S. Army and the Armed Forces Radiobiology Research Institute to investigate these concerns.

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A spokesperson from the Nuclear Regulatory Commission (NRC) described NRC's interest in DU as it relates to the medical and industrial uses of uranium, the uranium enrichment processes, and the uses of enriched uranium. He also examined the waste disposal issues associated with the many industrial and military sites contaminated with DU residues, as well as the treatment and disposal of the substantial amount of DU from uranium enrichment plants in the United States. NRC is responsible for developing regulations for these sources.

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The Department of Defense (DoD) representatives spoke on the advantages and uses of weapons manufactured with DU and the potential sources of military personnel exposures to DU. They also discussed the progress and results of their investigations into the illnesses.

Follow-up health studies to examine this population will be continued by the DoD and the Department of Veterans Affairs.

Agency Briefings on Radon and Radiation Research Priorities

In late 1993 the Executive Committee initiated a series of briefings on the Federal agencies' radon programs. The briefings were held in response to continuing CIRRPC programmatic interest in the issue, and to revisit the subject in light of earlier recommendations contained in the CIRRPC Policy Report, *Federal Programs in Indoor Radon* (1988). The recommendations in the report were intended to improve the coordination of plans, policies, and programs among Federal agencies.

The briefings, which began in December 1993, involved DOE, DoD, the Environmental Protection Agency, and the Departments of the Interior, Housing and Urban Development, Commerce, and Health and Human Services.

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In November 1993 and January 1994 the CIRRPC Science Panel held a two-session agency briefing on Ionizing Radiation Research Needs and Programs. The briefings were designed to familiarize member agencies with the elements of the FY 1994 Federal ionizing radiation research programs and to gain perspective on future research plans.

Agency representatives described the main elements of their respective agencies' research programs, the rationales for these elements, the changes (both substantive and financial) in these elements over the years, and the nature of interagency interactions in the development, funding, and management of the research programs.

The briefings included areas covered in an earlier report, *The Federal Ionizing Radiation Research Agenda Related to Low Level Biological Effects: FY 1985*, such as research on: (1) understanding and measuring interactions between radiation and biological materials; (2) determining the biological effects of ionizing radiation through experimental and epidemiological studies; and (3) assessing exposures and doses from the variety of sources encountered both in the workplace and in the general environment.

Follow-up reports on both the Executive Committee and Science Panel briefings are being developed.

POLICY SUBPANEL ACTIVITIES

Public Education

An informed public perspective on matters involving radiation is vital to national interests in health (the treatment and prevention of diseases), defense, energy production, communications systems, and other important sectors of society. To address the need for a coordinated Federal policy on public information programs on radiation and its health effects, CIRRPC established the Subpanel on Public Education.

The subpanel's report, *Balancing Radiation Benefits and Risks: The Needs of an Informed Public*, details the subpanel's findings and includes ideas generated during the Federal Agency Radiation Information and Education Workshop hosted by the subpanel in 1991. In the report, the subpanel recommends the establishment of a national radiation information center, the creation of outreach programs, the establishment of a communications infrastructure in agencies (or the enhancement of existing ones), and the encouragement of curriculum reform in mathematics and science education.

The report will be published in 1994.

Recommendations on Radiological Protection

This subpanel was established to help keep CIRRPC member agencies informed of new developments and plans for providing overall radiation protection measures. This task involves the review of recommendations and relevant publications from national and international bodies addressing radiation issues.

In 1993 the subpanel reviewed the draft report, *U.S. Position on Potential Exposure in International Basic Safety Standards.* The report was used as background material by participants in the March 8-9, 1993 meeting of the Expert Group on Safety Aspects of the Basic Safety Standards. The meeting focused on several aspects of the overall International Atomic Energy Agency's revision of the Basic Safety Standards for Radiation Protection.

SCIENCE SUBPANEL ACTIVITIES

Scientific Basis for Radiation Protection Standards: The Neutron Quality Factor

This subpanel's efforts have focused on the ICRP (1985) and the NCRP (1987) recommendations calling for an increase in the quality factor of neutrons (Q_n) by a factor of two; in effect, increasing the recommended Q for fast neutrons from 10 to 20.

The selection of Q_n is highly dependent on the "reference radiation" (the type and exposure conditions) chosen to compare biological effectiveness. The group is reviewing the basis and the experimental data relevant to this selection. Its preliminary conclusion that no change in Q_n is warranted at this time is consistent with current Federal agency practices.

The subpanel's report is expected to be completed in 1994.

High-Linear Energy Transfer Radiation

This subpanel, which was established to monitor the status of research and analyses addressing high-LET radiation and its biological effectiveness, assembled a task group of U.S. and European research community experts to identify research needs relative to the biological effectiveness of neutrons.

The experts were directed to develop a response to DOE's request that CIRRPC design a research program to provide a basis for more precisely determining the biological effectiveness of neutron radiation, with emphasis on end points relevant to the protection of human health.

The group's report, *Biological Effectiveness of Neutrons: Research Needs*, identifies research needs in the areas of physics and dosimetry, modeling, chemical and molecular mechanisms, cellular effects, deterministic effects in tissues and organs, and late effects in populations, including carcinogenesis, life span shortening, and hereditary effects. The report also provides prioritized research recommendations that reflect not only the importance that resources would have in improving the accuracy of risk estimates, but also the anticipated length of time before technological advances will make the research feasible.

The integrated approach to examining the biological effectiveness of neutrons includes recommendations on: (1) using information from studies of human populations known to have been exposed to neutrons; (2)

extrapolating human cancer risk for neutrons from animal data; (3) improving human cancer risk estimates through a better understanding of underlying mechanisms; and (4) ensuring that adequate laboratory and irradiation facilities are available and suitably staffed for an effective neutron radiobiology program.

The group's report was published in 1994.

Use of BEIR V and UNSCEAR 1988 in Risk Assessment

This subpanel was established to facilitate the use of the *BEIR V* and *UNSCEAR 1988* reports (published, respectively, by the National Research Council/National Academy of Sciences and the United Nations) in a coordinated manner by agencies with responsibilities for conducting risk assessments related to ionizing radiation exposures. This was the second task undertaken by CIRRPC in response to a DoD request that CIRRPC develop a coordinated position on risk assessment for low levels of ionizing radiation.

In its report, *Use of BEIR V and UNSCEAR 1988 in Radiation Risk Assessment: Lifetime Total Cancer Mortality Risk Estimates at Low Doses and Low Dose Rates for Low-LET Radiation*, the subpanel recommends two nominal risk estimates for lifetime total cancer mortality, after whole body exposures to low doses and low dose rates of low-LET ionizing radiation. The risk estimates (3.5×10^{-3} for the working-age population [between ages 18 and 65] and 4.5×10^{-3} for the general population) are for an absorbed dose of 0.1 Gray (10 rads).

The subpanel also provides a general statement on the scientific uncertainty associated with the application of the nominal risk estimates at low exposures generally experienced by workers and the public.

The report was published as CIRRPC Science Panel Report #9 in January 1993.

Occupational Radiation Protection Research

This subpanel was established to review research needs related to occupational radiation control practices, especially those needs that are not currently being addressed.

The subpanel's background report, *Research Priorities for Occupational Radiation Protection* (published in February 1994), discusses the results of an extensive canvass of government, professional, societal, commercial, state, and local occupational radiation protection organizations.

In this report, the subpanel addresses broad areas of radiation research it identified as particularly important to worker protection: (1) the reduction of uncertainties in health risk coefficients; (2) improvements in external personal dosimetry and internal bioassay techniques applicable to workplace exposures and limits; and (3) advanced techniques for health physics instrumentation.

The Workshop on Internal Dosimetry, conducted by the subpanel in April 1992, led to several cooperative efforts, such as the DOE-NRC follow-up work on the intercomparison of internal dosimetry measurements. As a result of deliberations at the workshop, the subpanel also recommended three areas for Science Panel consideration and possible major Federal effort: (1) a "Generic Model Structure" for internal dosimetry; (2) a national registry of human and animal tissue data; and (3) an intergovernmental effort to quantify background levels in biological samples.

The workshop proceedings will be available in 1994.

Health Effects of Electromagnetic Fields

This subpanel was initially formed by the CIRRPC Science Panel in response to a request from the Department of Labor (DOL) and the Office of Science and Technology Policy for a review of the literature on the possible health risks to humans from exposure to low-frequency electromagnetic fields (EMF).

In 1991, based on the subpanel's recommendations, CIRRPC tasked ORAU to conduct an external review, by an independent panel of experts, of the reported health hazards of exposure to extremely low-frequency electric and magnetic fields (especially reports of carcinogenesis and reproductive and neurophysiological effects). The 11 panel members were asked to review and evaluate all appropriate information on the subject published within the last 15 years from the date the panel was established. The panel focused on power frequencies (15 to 180 hertz) and video display terminal frequencies (10 to 30 kilohertz) because these sources appeared to be of greatest public concern.

In its report, *Health Effects of Low-Frequency Electric and Magnetic Fields* (1992), the panel concluded that "...there is no convincing evidence in the published literature to support the contention that exposures to extremely low-frequency electric and magnetic fields (ELF-EMF) generated by sources such as household appliances, video display terminals, and local power lines are demonstrable health hazards."

The report was well received, and it has continued to generate government

and public interest. Both the ORAU panel of experts and the ORAU project managers have continued to receive requests from national and international bodies for copies of the report and for oral presentations on the subject.

After the subpanel's work in response to the initial request was completed, the subpanel continued to serve as a resource for CIRRPC on activities related to EMF issues. The subpanel functions as a forum for the interchange of information among Federal agencies on emerging operational and research programs, regulatory issues, and significant research reports in the field.

The subpanel recently discussed EMF-related efforts within their agencies and other activities the members felt should be addressed by an interagency group. The members identified several areas (e.g., standards and new technologies) where it might be beneficial for them to develop a series of "fact sheets." To integrate these new activities under their existing responsibilities, the members proposed to modify the subpanel's original work statement to cover a broader range of frequencies and to add a representative from the Department of Transportation. The Science Panel approved the expanded work statement in April 1994.

Fluence-Based System of Radiation Risk Assessment

This subpanel was established in 1993 in response to a National Aeronautics and Space Administration request for an examination of the use of particle fluence to improve radiation risk assessment. (Particle fluence is the number of particles per unit area on, or passing through, a sphere.) The use of particle fluence could be particularly important in the assessment of health risks from exposures to particulate radiation, such as radiation from high-Z particles encountered by mission personnel during space exploration.

The subpanel reviewed several fluence-based models and other relevant issues presented by members and by guest speakers. The topics included the lethal/potentially lethal model, risk cross sections, fluence spectrometry and mean relative biological effectiveness, the hit-size effectiveness approach, the track structure model, and other related models of fluence-based biological responses.

The subpanel is currently drafting a report that will include summaries of the models that have been examined and suggestions for areas of research to reduce uncertainties.

SPECIAL PROJECTS AND STUDIES

Collective Dose

The concept of collective dose (the product of the numbers of persons exposed, multiplied by their average exposure) is used in assessing population health risks and in making radiation protection decisions. It is a topic of continuing interest to many Federal agencies and other national and international organizations responsible for radiation protection.

ORAU, under CIRRPC sponsorship, contracted with NCRP for a critical review of the concept of collective dose, relative to its use in controlling radiation exposure and in assessing health risks resulting from such exposures.

Specific tasks under the contract include:

- a review of the current applications of the collective dose concept;
- an examination of the scientific basis and the validity of applying the concept of collective dose to radiation protection and risk assessment; and
- an examination of the meaning and usefulness of the collective dose concept, as used in protecting both workers and members of the general public.

Results of the review will be published as an NCRP report in 1994.

Radon

At the request of CIRRPC, ORAU also entered into a contract with NCRP to develop and publish a comprehensive report examining the radon exposure levels experienced by the U.S. population and the health concerns associated with these levels.

The report will reflect the considerable amount of new information available since NCRP Report 78, *Evaluation of Occupational and Environmental Exposures to Radon and Radon Daughters in the United States*, was issued in 1984. It will also include more detailed information on estimates of radon exposure levels in underground mines, which provide the basic data for establishing a relationship between radon exposures and lung cancer.

This study is expected to be completed by NCRP in 1994.

LEGISLATIVE MONITORING

In 1993 the 103rd Congress had its first opportunity to fund energy programs authorized by the Energy Policy Act of 1992. During the first Congressional session, the House and Senate recognized nuclear energy as a significant element in the nation's search for safe and environmentally sound domestic energy sources. Both bodies acted to ensure the progress of efforts on spent fuel management and the research and development of advanced light-water reactors (ALWRs) and other advanced reactor technologies.

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Of particular note, the Energy and Water Development Appropriations Act for FY 1994 directed that Nuclear Waste Fund money allocated to Nevada be spent solely for scientific oversight at Yucca Mountain to determine the site's suitability as a repository. The bill further prohibited the use of such funds by the state or for lobbying or coalition-building purposes.

A total of $380 million was allocated for activities mandated by the Nuclear Waste Policy Act, including: $262 million for continued site-characterization activities at Yucca Mountain; $177 million for uranium-enrichment activities associated with the U.S. Enrichment Corporation, including gaseous diffusion plant operations, environmental restoration, and waste management, as well as $80 million for the development of the atomic vapor laser isotope separation (AVLIS) technology; and $30 million for research and evaluation efforts for the production of tritium and for the initiation of a review of all options for the disposal of plutonium from dismantled nuclear warheads.

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Congress allocated $57 million for ALWR research and development activities. It also approved language to encourage timely NRC efforts toward ALWR design certification and the renewal of operating plant licenses as part of the FY 1994 Energy and Water Development Appropriations Act (P.L.103-126).

In addition to ALWR funding, Congress sustained $30.4 million for the advanced liquid metal reactor (ALMR) and $12 million for the gas turbine modular helium reactor (GTMHR) under the $22.3 billion appropriations bill. The ALMR and GTMHR programs, however, were the subject of intense House and Senate floor discussions as members sought to trim Federal spending after tough political elections and the passage of President Clinton's massive-deficit reduction plan.

As part of the administration's goal to reduce the Federal deficit, President Clinton proposed a rescission package to cut FY 1994 appropriations by $2 billion. He also proposed a "reinventing government" plan to streamline Federal agencies and to save another $32 billion. Under the rescission package, President Clinton proposed to reduce funds for nuclear energy programs by $139 million.

In addressing the rescission proposal shortly before adjournment, however, the House rejected the Administration's proposed nuclear energy program cuts in favor of a $97.3-million across-the-board budget reduction for all energy programs and a $42-million cut in the AVLIS program. The rescission program, which was not completed before the Congress adjourned for 1993, was completed with no changes from the House version 's section on nuclear power, in the second session of the 103rd Congress.

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The Senate passed an EPA Cabinet measure, but the House, facing a full agenda in the closing days of the first session and widespread disagreement on an amendment to the legislation, deferred action on the legislation until the next session when the Senate added provisions (Title I to S.2019, "The Safe Drinking Water Act") to elevate EPA to a Cabinet-level "Department of Environmental Protection."

Senator Glenn, who introduced this measure, stated that this provision incorporates S.171, a free-standing bill to establish a Department of Environmental Protection that passed the Senate in 1993. The only difference is that the provision of risk assessment has been dropped. Senator Glenn stated that a compromise on risk assessment has already been debated and adopted as a separate amendment to the Safe Drinking Water Act authorization.

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The Nuclear Energy Institute (NEI) was formed on March 16 as a Washington-based trade association dedicated to the peaceful uses of nuclear technology. NEI will integrate industry-wide programs previously managed by the American Nuclear Energy Council (ANEC), the U.S. Council for Energy Awareness (USCEA), the Nuclear Management and Resources Council (NUMARC), and the Edison Electric Institute's (EEI) nuclear division.

APPENDICES

Appendix A

ACRONYMS

ALMR	Advanced liquid metal reactor
ALWR	Advanced light-water reactor
AVLIS	Atomic vapor laser isotope separation
BEIR	(Committee on the) Biological Effects of Ionizing Radiations
CIRRPC	Committee on Interagency Radiation Research and Policy Coordination
DoD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
DU	Depleted uranium
EMF	Electromagnetic fields
GTMHR	Gas turbine modular helium reactor
ICRP	International Commission on Radiological Protection
LET	Linear energy transfer
NCRP	National Council on Radiation Protection and Measurements
NRC	Nuclear Regulatory Commission

NSTC	National Science and Technology Council
ORAU	Oak Ridge Associated Universities
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation

Appendix B

CIRRPC MEMBER AGENCIES AND THEIR REPRESENTATIVES

As of May 1994

(*Denotes Science Panel Member)

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Appendix E

CIRRPC POLICY AND SCIENCE REPORTS*
1984-1994

Science Panel Report No. 1: VA Assessment of Veterans with Military Service at Sites of Temporarily Augmented Ionizing Radiation (September 1984)

Science Panel Report No. 2: CIRRPC Scientific Report on the Draft Report of the Ad Hoc Group to Develop Radioepidemiological Tables (November 1984)

Science Panel Report No. 3: CIRRPC Scientific Report on the Report of the National Institutes of Health Ad Hoc Working Group to Develop Radioepidemiological Tables (January 1985)

Report on Identification of Federal Radiation Issues (March 1986)

International Activities Report (June 1986)

Science Panel Report No. 4: Radon Protection and Health Effects (August 1986)

SI Metric Radiation Units (December 1986)

Member Agency Participation in International Radiation Activities (Update: May 1987)

The Federal Ionizing Radiation Research Agenda Related to Low Level Biological Effects: FY85 (ORAU Report, March 1988)

Science Panel Report No. 5: Review of Scope 28 Report on Environmental Consequences of Nuclear War: Volume II, Ecological and Agricultural Effects (March 1988)

Federal Programs on Indoor Radon (April 1988)

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Science Panel Report No. 6: Use of Probability of Causation by the Veterans Administration in the Adjudication of Claims of Injury Due to Exposure to Ionizing Radiation (August 1988)

A Compendium of Major U.S. Radiation Protection Standards and Guides: Legal and Technical Facts (ORAU Report, July 1988; Update: April 1992)

Report of the CIRRPC Ad Hoc Planning Group (December 1988)

Report of the Executive Committee Regarding EPA NESHAP Regulations on Radionuclides for Medical Research Institutions and Radiopharmaceutical Manufacturers (June 1990)

Science Panel Report No. 7: Planning for Human Health Effects Research in the Event of a Nuclear Accident (June 1990)

Science Panel Report No. 8: Ionizing Radiation Risk Assessment (BEIR IV) (October 1991)

Health Effects of Low-Frequency Electric and Magnetic Fields (ORAU Report, June 1992)

Science Panel Report No. 9: Use of BEIR V and UNSCEAR 1988 in Radiation Risk Assessment: Lifetime Total Cancer Mortality Risk Estimates at Low Doses and Low Dose Rates for Low-LET Radiation (December 1992)

Research Priorities for Occupational Radiation Protection (February 1994)

Biological Effectiveness of Neutrons: Research Needs (February 1994)

Balancing Radiation Benefits and Risks: The Needs of an Informed Public (June 1994)

Appendix F

CIRRPC MEETINGS
(January 1, 1993-June 30, 1994)

1993

January

4 Science Panel

12 Neutron Quality Factor Writing Group

21 Occupational Radiation Protection Research Subpanel (at NRC)

25 Science Panel
Executive Committee

February

9 Neutron Quality Factor Writing Group

26 Executive Committee

March

8 Science Panel

12 Neutron Quality Factor Writing Group

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April

12 Science Panel

22 Use of Particle Fluence for Radiation Risk Assessment Subpanel

Science Panel
Executive Committee

May

6 Executive Committee

10 Science Panel

19 Occupational Radiation Protection Research Subpanel

20 Science Panel
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24 Use of Particle Fluence for Radiation Risk Assessment Subpanel

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7 Science Panel

9 Public Education Subpanel

Executive Committee

16 Use of Particle Fluence for Radiation Risk Assessment Subpanel

29 Health Effects of Electromagnetic Fields Subpanel

July

8 CIRRPC Policy Meeting

Use of Particle Fluence for Radiation Risk Assessment Subpanel

August

5 Use of Particle Fluence for Radiation Risk Assessment Subpanel

Science Panel Executive Committee

23 Science Panel

30 Executive Committee

September

1 Use of Particle Fluence for Radiation Risk Assessment Subpanel

3 DOL Agency Visit

21 Meeting with CEC Representatives

28 Occupational Radiation Protection Research Subpanel

29 Use of Particle Fluence for Radiation Risk Assessment Subpanel

October

6 Neutron Quality Factor Writing Group

7 Science Panel Executive Committee

Executive Committee

21 DOE Agency Visit

28 DOI Agency Visit

November

1 Use of Particle Fluence for Radiation Risk Assessment Subpanel

23 Executive Committee

29 Science Panel

Use of Particle Fluence for Radiation Risk Assessment Subpanel

December

2 Executive Committee

15 Science Panel Executive Committee

Executive Committee

1994

January

3 Science Panel

Use of Particle Fluence for Radiation Risk Assessment Subpanel

10 Neutron Quality Factor Writing Group

27 NSF Agency Visit

Science Panel
Executive Committee

February

1 Executive Committee

7 Use of Particle Fluence for Radiation Risk Assessment Subpanel

Science Panel

17 Science Panel
Executive Committee

Executive Committee

March

3 Public Education Subpanel

7 Science Panel

14 Health Effects of Electromagnetic Fields Subpanel

15 Public Education Subpanel

21 Executive Committee Meeting with NRPB

24 Science Panel
Executive Committee

Executive Committee

April

4 Science Panel

5 Public Education Subpanel

12 Health Effects of Electromagnetic Fields Subpanel

14 Science Panel
Executive Committee

Executive Commitee

May

10 Science Panel

17 Health Effects of Electromagnetic Fields Subpanel

19 EPA Agency Visit

Science Panel
Executive Committee

Executive Committee

June

13 Science Panel

21 Executive Committee