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**COMMITTEE ON INTERAGENCY RADIATION RESEARCH
AND POLICY COORDINATION
(CIRRPC)**

SEVENTH ANNUAL REPORT

June 30, 1991

**Alvin L. Young
Chairman, CIRRPC**

**Office of Science and Technology Policy
Executive Office of the President
Washington, D.C. 20506**

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

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COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION

Seventh Annual Report

July 1, 1990 to June 30, 1991

I INTRODUCTION

The Committee on Interagency Radiation Research and Policy Coordination (CIRRPC)¹ is a subcommittee under the Federal Coordinating Council for Science, Engineering and Technology (FCCSET). CIRRPC reports to the Office of Science and Technology Policy (OSTP), Executive Office of the President, through the Committee on Life Sciences and Health (CLSH), a FCCSET committee. CIRRPC was chartered on April 9, 1984 to act as a vehicle for the exchange of information on radiation issues of national significance among Federal agencies. CIRRPC's overall charge is to coordinate radiation matters among agencies, evaluate radiation research, and provide advice on the formulation of radiation policy. Throughout its seven years of operation, CIRRPC has met these responsibilities by serving as a forum where its 17 member agencies can discuss and resolve radiation issues to best serve national interests.²

CIRRPC's member agencies have policy or scientific roles in either or both the regulation and the use of radiation. These agencies are each represented by subcabinet or senior policy representatives³ who not only represent their agencies on CIRRPC and its policy subpanels, but also provide review and approval of reports developed by CIRRPC's subpanels. CIRRPC holds general meetings for all its member agencies two or three times a year to address radiation policy issues.

The Science Panel, CIRRPC's scientific body, is composed of senior scientific representatives from 14 member agencies that have scientific components. The Panel's monthly meetings serve as opportunities not only for discussing scientific issues of mutual interest, but also for briefing members on actions and programs within the agencies and for acting on reports developed by the science subpanels.

¹ A complete list of acronyms used in this report is contained in Appendix A.

² Appendix B is a list of CIRRPC meetings held during the last year to discuss Federal radiation issues.

³ A list of member agencies and their representatives is attached as Appendix C.

CIRRPC'S LOCATION IN THE EXECUTIVE BRANCH

EXECUTIVE OFFICE OF THE PRESIDENT

Office of Science
and Technology Policy
(OSTP)

|

**FEDERAL COORDINATING COUNCIL
FOR SCIENCE, ENGINEERING,
AND TECHNOLOGY (FCCSET)**

|

**COMMITTEE ON LIFE SCIENCES
AND HEALTH (CLSH)**

|

**COMMITTEE ON INTERAGENCY
RADIATION RESEARCH
AND POLICY COORDINATION (CIRRPC)**

Chairman
Policy Representatives
17 Member Agencies

The CIRRPC Executive Committee is responsible for the overall planning and management of CIRRPC's programs and resources. The Committee is composed of officers from both the policy and science bodies, as well as the Department of Energy (DOE) Technical Assistance Director.⁴ The Executive Committee also holds monthly meetings.

The technical and administrative support required to facilitate CIRRPC's operation is provided through a DOE contract with Oak Ridge Associated Universities (ORAU), a not-for-profit research and development corporation.⁵ Funding for this contract is provided by the CIRRPC member agencies.

CIRRPC addresses issues in response to requests from member agencies or OSTP, but it also deals with issues that are of overall interest to CIRRPC or its Science Panel. Once a specific issue has been brought to CIRRPC's attention, a policy or a science subpanel usually is established to examine the issue. At times, task groups or outside (non-Federal) consultants are used when additional expertise is needed, or when a non-Federal position on an issue is required. A subpanel's work usually culminates in the development of a report on the issue. This report reflects either consensus or, in case this is not possible, the range of the subpanel members' opinions and positions. To date, CIRRPC has issued a total of 16 reports.⁶

In addition to interacting with Federal agencies, CIRRPC and its representatives, its Science Panel, and its subpanels also interact with various national and international organizations to exchange scientific and policy information on issues of mutual interest. These organizations include the National Council on Radiation Protection and Measurements (NCRP), the International Commission on Radiological Protection (ICRP), the National Academy of Sciences (NAS), the Conference of Radiation Control Program Directors (CRCPD), the Commission of the European Communities (CEC), the Health Physics Society (HPS), national laboratories, and nuclear industry groups.

CIRRPC Program Highlights

In 1990-91 CIRRPC's program included efforts to improve interagency coordination on ionizing radiation risk assessments, a review of the reported health risks to humans from exposure to extremely low-frequency electric and magnetic fields (ELF/EMF), and increased coordination with national and international organizations such as NCRP and ICRP.

⁴ Appendix D contains a list of current Executive Committee officers.

⁵ See Appendix E for a list of ORAU staff members supporting CIRRPC.

⁶ See Appendix F for a list of published reports and Appendix G for a list of current subpanels and their members.

The first effort by CIRRPC in the coordination of risk assessment among Federal agencies was CIRRPC Science Panel Report No. 8, Ionizing Radiation Risk Assessment: BEIR IV,⁷ a review of the NAS Report, Health Risks of Radon and Other Internally Deposited Alpha Emitters: BEIR IV. Science Panel Report No. 8, approved by CIRRPC in December 1990, concludes that the NAS BEIR IV report does represent a basis for Federal agency agreement on risk estimates for radon. The CIRRPC report also recommends the continuation of interagency reviews for other reports such as the 1988 report by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR 1988) and the NAS report, Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V. Another CIRRPC Subpanel has now reviewed these two reports and has drafted a report on the use of BEIR V and UNSCEAR 1988 in radiation risk assessment. Other activities in relation to risk assessment include the initiation of an interagency review of ICRP's revised recommendations for radiological protection (ICRP Report 60).

CIRRPC is also sponsoring a study examining the scientific basis and utility of "collective dose" in radiation risk assessment and a study to comprehensively review and examine the health risks associated with exposure to radon. This latter review utilizes a data base that extends beyond that used in the NAS BEIR IV report. Both CIRRPC-sponsored studies are being performed by NCRP under an ORAU contract.

In response to reports of possible health effects from low-frequency electric and magnetic radiation, CIRRPC, at the request of the Department of Labor (DOL) and OSTP, developed a work statement for an external review of the reported health hazards of exposure to these fields. The review, which is being conducted by an independent panel of experts, will deal especially with reports of carcinogenesis and reproductive and neurophysiological effects. CIRRPC has given ORAU responsibility for this review which will culminate in the development of a report within six months following the group's initial meeting in September. Among other issues, the report will address the question of the existence of clear health hazards from exposures to ELF/EMF emitted from transmission and distribution lines, video display terminals, or appliances, and the question of whether or not sufficient data exist upon which to base reasonable quantitative risk assessments.

In the area of public education and information, CIRRPC was involved in two major activities: a Federal workshop on public information and education on radiation and the Health Physics Society (HPS) Summer School.

The Federal Agency Radiation Information and Education Workshop was conducted in May 1991 by the CIRRPC Policy Subpanel on Public Education. This Subpanel was established to examine education in the area of radiation and to develop a coherent and coordinated Federal policy on public information on radiation and its health effects. The workshop, which brought together representatives from 13 Federal agencies, was held to benefit from the public information and education experiences of other Federal agencies

⁷ BEIR = biological effects of ionizing radiation.

in evaluating the viability of the Subpanel's proposed solutions to issues confronting public education and information on science, in general, and radiation, in particular.

The HPS Summer School will be held in Washington, D.C. at the Georgetown University from July 15 to 19, 1991. The School is expected to attract over 70 American and international participants and 17 scientists who will lecture on various aspects of the radiological protection practice and its biological basis. CIRRPC is providing financial assistance to the HPS Summer School for student scholarships and the publication of the lecture papers under the title The Biological Basis of Radiation Protection Practice.

The work of previously established panels and subpanels also continued and resulted in the completion of several draft reports which are currently being reviewed or revised. Among these are reports on the regulation of discrete sources of naturally occurring and accelerator-produced radioactive materials (NARM), the neutron "quality factor" in radiation protection, research needs related to neutron biological effectiveness and occupational exposures, and a review of the Environmental Protection Agency's (EPA) draft report on the carcinogenicity of ELF/EMF. CIRRPC also has tasked ORAU to begin an update of its compendium of major U.S. radiation protection standards and guides; this document has proven to be a valuable reference throughout the radiation protection and legal communities.

II CIRRPC ACTIVITIES

CIRRPC and its members held two general meetings during the year. At the November 8, 1990 meeting, Dr. James O. Mason, Assistant Secretary for Health, Department of Health and Human Services (HHS), described reorganization efforts within FCCSET, where agency representation is at the Secretarial or head of agency level. According to Dr. Mason, one of the results of the reorganization was the creation of seven committees to address specific areas of interest. The Committee on Life Sciences and Health (CLSH), chaired by Dr. Mason, is one of these new committees, and CIRRPC has been designated as a subcommittee under it.

Citing the Federal government's responsibility to provide good risk information to the public, Dr. Mason stressed the need for more government reports on risk that the public can use for enhanced understanding and guidance in decision-making. To this end, he added that he wanted to broaden the audience for CIRRPC reports by including issues related to non-ionizing radiation, particularly the effects of ELF/EMF radiation, which the public has been concerned about. Dr. Mason pointed out that the theme of "good science and good sense" should dominate all reporting efforts. He appreciated the fact that since CIRRPC's inception, it has remained firmly committed to this theme.

At the meeting, Dr. Douglas Sargeant of the National Weather Service (NWS) of the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) also briefed attendees on the proposed deployment of the Next Generation Radar (NEXRAD) system to enhance weather forecasting. Other topics discussed at the meeting included the effectiveness of CIRRPC reports and the need to expand the distribution of

the reports; food irradiation and the role that CIRRPC could play in coordinating and developing a government position on the issue; and the major comments received by EPA on its draft revised report, Citizen's Guide to Radon, which earlier had been distributed to the Federal agencies for review.

The second CIRRPC meeting was held on May 9, 1991. At this meeting, the Chairman, Dr. Alvin Young of the U.S. Department of Agriculture (USDA), announced that CIRRPC had been tasked by OSTP to address the subject of the potential health effects of ELF/EMF. According to Dr. Young, the subject of electric and magnetic fields had been elevated to the level of the President's Executive Office. He added that the importance of CIRRPC's efforts in this area was recognized by a number of high-level officials in the Executive Branch.

Dr. Young announced the designation of Colonel Everette E. Gray as DOE's new Technical Assistance Director for CIRRPC activities. Colonel Gray replaced Captain Jay G. McDonald, whose contributions were underscored at the meeting. Dr. Young also announced that Mr. Robert Bernero, of the Nuclear Regulatory Commission (NRC), had been nominated to serve as CIRRPC's Vice Chairman. Dr. Young expressed his appreciation, on behalf of the CIRRPC members, for Mr. Guimond's service to CIRRPC during his term as Vice Chairman.

At the meeting, agency representatives also summarized current agency activities related to ELF/EMF, and Dr. Marvin Rosenstein (HHS), Science Panel Vice Chairman, presented an update of the activities of the CIRRPC policy and science subpanels.

Executive Committee Activities

In an effort to keep officials informed on CIRRPC and its activities, separate briefings were held for Dr. D. Allan Bromley, Dr. Donald A. Henderson, and other OSTP staff; and for Dr. James O. Mason and other members of CLSH. In April Executive Committee members also met with members of the Public Health Service group of HHS to brief them on CIRRPC activities and to discuss topics of mutual interest.

CIRRPC representatives also met this year with NCRP representatives to discuss topics of mutual interest, including the progress of the two reports being prepared under contractual arrangements between ORAU and NCRP. Other topics also discussed at the CIRRPC/NCRP meetings included activities in occupational radiation protection research, activities in risk assessment, and the 1990 ICRP report, Recommendations of the International Commission on Radiological Protection (ICRP Publication 60).

During the past year, the Executive Committee approved CIRRPC's sponsorship of the Federal Agency Radiation Information and Education Workshop, hosted by the Policy Subpanel on Public Education, and CIRRPC's support for the HPS Annual Summer School, as discussed above. The Executive Committee also:

- approved the formation of an ad hoc group to address policy issues identified in Science Panel Report No. 7, Planning for Human Health Effects Research in the Event of a Nuclear Accident (see III-D);
- approved the publication of Science Panel Report No. 8, Ionizing Risk Assessment: BEIR IV, which is a review of the NAS report, Health Risks of Radon and Other Internally Deposited Alpha-Emitters: BEIR IV (see IV-C);
- tasked ORAU to review the scientific literature on potential adverse health effects from ELF/EMF fields (see IV-F); and
- agreed to transmit to the Science and Policy representatives the report of the ad hoc group tasked by the Executive Committee to prepare a report on CIRRPC procedures (see V-D).

III CIRRPC POLICY SUBPANEL ACTIVITIES

A. Naturally-Occurring and Accelerator-Produced Radioactive Materials (NARM)

The creation of this Working Group was in response to a request from the NRC Chairman to the OSTP Director to have CIRRPC examine the need for Federal regulation of "discrete" sources of NARM. This request stemmed from an earlier CRCPD request that NRC seek legislative authority to regulate those sources of NARM.

The Working Group's examination culminated in a draft report which includes recommendations on the regulation of NARM and on the interaction of the Federal agencies, CRCPD, and individual states in assuring that there are appropriate controls for these radioactive materials. The draft report was sent to CIRRPC member representatives for review and approval in June 1990. The review resulted in a request from the Department of Defense (DOD), DOE, and NRC for a substantive revision requiring a more extensive collection of information and a more comprehensive evaluation.

A meeting of the Working Group was held in December to agree on the additional information needed to revise the report accordingly. As part of the revision, the Working Group members were also requested to prepare summaries of their agencies' authority for regulating natural radioactivity to be used as input to the revised report. To complete the revision of the draft report, additional information-gathering activities, including a request

for information from CRCPD and Federal agencies on radium disposal history, have been initiated and are currently underway.

B. Public Education

In October 1989 the Subpanel on Public Education was formed to address the question of the status of public education on radiation. The Subpanel's principal objective is to develop a coherent and coordinated Federal policy on public information on radiation and its health effects. Last year, the Subpanel initiated information-gathering activities, including a review of Federal public information and education efforts, meetings with nuclear industry staff involved in educational programs, and briefings by representatives of public relations and special interest groups involved in nuclear energy-related information dissemination activities. As a result of these meetings and presentations, the Subpanel concluded that in spite of significant Federal agency efforts in public information and education, there is continuing evidence of public scientific illiteracy in general, particularly in the radiation area.

From May 28 to 31, the Subpanel presented its proposed solutions for discussion at the Federal Agency Radiation Information and Education Workshop held at the Federal Emergency Management Agency's (FEMA) National Emergency Training Center in Emmitsburg, Maryland. In addition to the Subpanel members, the workshop also brought together over 20 representatives from the public affairs/media, policy/management, and education areas of 13 Federal agencies. The participants used their expertise and experience to evaluate the proposed solutions and the issues involved in their implementation. The ideas generated at the workshop will constitute a significant portion of the report being developed by the Subpanel on the subject.

In the workshop's keynote address, Dr. Alicia Dustira (OSTP) addressed the Administration's renewed emphasis on science and technology education by briefly discussing the FCCSET Subcommittee on Education and Human Resources' report, By the Year 2000: First in the World. Dr. Dustira also briefed the participants on OSTP's efforts in resolving problems in the area of risk assessment and risk communication through its work with FCCSET's Ad Hoc Working Group on Risk Assessment. She concluded by saying that the ideas generated by the workshop, particularly in relation to the determination of approaches for the optimal communication of risk and public education, would be of special interest to OSTP.

The results of the workshop were presented to the Executive Committee in June by the Subpanel Chairman, Mr. Leven Gray of the National Aeronautics and Space Administration (NASA). A report on the workshop proceedings and major conclusions is being prepared.

C. Recommendations on Radiological Protection

The Subpanel on Recommendations on Radiological Protection was established in 1990 to assist CIRRPC's member agencies in keeping informed of recommendations and other statements of the principal radiation protection organizations, such as ICRP and NCRP. The Subpanel's tasks are to monitor the progress towards the adoption of revised recommendations, to familiarize itself with the new features of these recommendations, and to provide status reports to CIRRPC members. In addition, the Subpanel serves as the focal point for discussions and reactions to the recommendations, the identification of related issues, and the development of proposals for activities that CIRRPC could undertake in relation to the new recommendations. Nine agencies are represented on the Subpanel.

The first meeting of the Subpanel took place in January, and its first task was to develop a statement to be used by CIRRPC member agencies in responding to inquiries regarding ICRP's new recommendations for radiation protection. The Subpanel monitored the development of the new recommendations and issued an Information Statement on the New ICRP Recommendations (dated June 5, 1991) which notes that the new recommendations continue the fundamental principles currently in use throughout the Federal government. On the basis of the available information, the Subpanel did not identify the need for any immediate fundamental changes in the current regulatory structure. The Statement also provides a brief overview of how radiation protection standards are developed in the United States and how the recommendations of national and international organizations relate to that process.

The Subpanel's next steps are to conduct an in-depth review of the published ICRP recommendations, and other radiation protection recommendations, and to identify specific issues that should be considered by CIRRPC for further action.

D. Follow-Up to Science Panel Report No. 7

In October 1990 the Executive Committee approved the formation of an ad hoc group to address policy issues identified in Science Panel Report No. 7, Planning for Human Health Effects Research in the Event of a Nuclear Accident, prepared by a science subpanel and approved for publication in June 1990. The report recommends the coordination of a pre-disaster planning effort to organize the collection of health-related information, but does not deal with how existing emergency preparedness procedures might need to be modified. Among the science subpanel's recommendations, therefore, was that before CIRRPC takes any step toward recommending the initiation of an interagency effort, the associated policy, financial, and other issues identified in the subpanel report (and raised by member agencies in their review) would have to be resolved first at the policy level. The creation of an ad hoc group was the first step toward this resolution.

Major developments in relation to this task have revolved around the definition of a work statement for the group. NRC and FEMA were asked to lead this effort, and representatives from NRC, FEMA, HHS, DOE, and DOD met with the chairman of the science subpanel responsible for the Science Panel Report No. 7 to draft the work

statement for the ad hoc group. A draft of this work statement is currently being reviewed by NRC and FEMA.

IV SCIENCE SUBPANEL ACTIVITIES

A. Scientific Basis for Radiation Protection Standards

This Subpanel was initially set up to examine the scientific basis of recommendations contained in the 1977 ICRP Report 26, Recommendations of the International Commission on Radiological Protection. The Subpanel's efforts have focused on the recommendation from ICRP (1985) and NCRP (1987) 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 Subpanel reviewed this issue by examining the basis and the experimental data relevant to the selection of an appropriate value of Q_n for use in radiation protection. In its draft report, The Neutron Quality Factor, the Subpanel concludes that an increase in Q_n is not warranted without further consideration because neutrons have not been clearly shown to be more effective in producing biological effects than was previously assumed.

The report was reviewed by the Science Panel in August, and substantive comments were received from DOD, EPA, and the Department of Transportation (DOT). Although the principal conclusion remained unchanged, the comments did necessitate a significant revision of the report. The rewrite group has been in the process of revising the report to make it responsive to the divergence of opinions within the radiation protection community over the appropriate value(s) of Q_n to be used for radiation protection purposes. Current efforts have focused on discussions of major issues involved in specifying the type of radiation appropriate to be used as an assigned reference radiation ($Q = 1$). Discussions also have been held on the interpretation of experimental data on the relative biological effectiveness of other types of radiation, consistent with applying Q values to these types of radiation.

Future issues surrounding radiation protection standards will be addressed by the newly established CIRRPC Subpanel on Recommendations on Radiological Protection (see III-C above).

B. High-Linear Energy Transfer (LET) Radiation

The Subpanel on High-LET Radiation was initially established to monitor the status of research and analyses addressing these types of radiation and their biological effectiveness. The Subpanel is currently responding to a DOE request for the development of a research program to provide a basis for a more precise determination of the biological effectiveness of neutron radiation, with emphasis on endpoints relevant to the protection of human health. To facilitate its work, the Subpanel assembled a group of experts from both the U.S. and European research communities to address the issue.

The experts have identified research needs in the areas of physics and dosimetry, modeling, chemical and molecular mechanisms, cellular effects, nonstochastic effects in tissues and organs, and late effects in populations, including carcinogenesis, life span shortening, and hereditary effects. The draft report of the scientific experts was transmitted to the Science Panel for review in June 1991. The report is currently undergoing simultaneous review by the Science Panel, by current and former members of the High-LET Subpanel, and by other scientists recommended by the group of experts. Comments on the draft report are due in September.

C. Ionizing Radiation Risk Assessment: BEIR IV

In response to a DOD request for assistance in developing a coordinated Federal position on risk assessment, CIRRPC established several science subpanels to review the major scientific reports on the biological effects of ionizing radiation (BEIR). The first of these subpanels conducted a review of the risk factors in the NAS report, Health Risks of Radon and other Internally Deposited Alpha-Emitters: BEIR IV. Specifically, the Subpanel was tasked to evaluate how the uncertainties identified in BEIR IV would impact the report's application to Federal risk assessments; to identify the Federal radiation activities to which BEIR IV's scientific analysis might be applied; and to provide the Science Panel with a report on the potential for consistent use of BEIR IV in Federal risk assessments.

In its report, Ionizing Radiation Risk Assessment: BEIR IV, approved for publication as Science Panel Report No. 8, the Subpanel notes the emphasis given to radon in BEIR IV and concludes that the radon risk value does represent a basis for Federal agreement; values for other internally deposited alpha emitters are acceptable for use, with some conditions. The Subpanel report further recommends similar reviews for BEIR V, the 1988 report of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR 1988), entitled Sources, Effects and Risks of Ionizing Radiation, and other similar resource documents.

The Subpanel's report was presented to CLSH in January. The CLSH Chairman, Dr. James Mason, later transmitted his committee's comments to the CIRRPC Chairman. The Subpanel is currently working on a response addressing each of the comments received from CLSH.

D. Use of BEIR V and UNSCEAR 1988 in Risk Assessment

This Subpanel was established to facilitate the use of the NAS report, Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V, and UNSCEAR 1988 in a coordinated manner by agencies that have risk assessment responsibilities related to ionizing radiation exposures.

The Subpanel's draft 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, was sent to the CIRRPC Science Panel for approval by early August. In this report, the Subpanel recommends two nominal risk estimates for lifetime total cancer mortality following whole body exposures to low levels of low-LET ionizing radiation: one for the general population and one for the working-age population. The report also includes the rationale for the selection of its nominal risk estimates and a discussion of the scientific uncertainty of risk estimates at low doses. A similar report addressing specific organ or tissue cancer risks is currently underway.

E. Occupational Radiation Protection Research

This Subpanel was established in response to a letter to CIRRPC from NRC which indicated the need for interagency coordination in the area of radiological health protection research. Specifically, the Subpanel's work statement calls for a review of occupational radiation exposure control practices and agency responsibilities for conducting related research. In addition, the Subpanel also has been requested to identify present and anticipated critical research needs not currently being addressed.

The Subpanel's draft report, National Priorities for Occupational Radiation Protection Research, represents the culmination of an extensive canvass of government, professional, society, commercial, state, and local level occupational radiation protection concerns. The four broad areas of radiation research that have been identified as being especially important to worker protection are:

- the reduction of uncertainties in health risk coefficients;
- improvements in external personal dosimetry techniques applicable to workplace exposures and limits;
- improvements in internal bioassay techniques applicable to workplace exposures and limits; and
- advanced techniques for health physics instrumentation.

The Subpanel has proposed the expedition of these research needs through multi-agency focus, priority emphasis, and possible joint funding. To achieve this focus, the Subpanel has considered a series of scientific workshops for each of the research areas identified.

At present, the draft report is undergoing revision in response to comments received after it was reviewed by the Science Panel and the Executive Committee. A workplan for obtaining multi-agency support for needed research also has been developed. Meanwhile, the Subpanel has singled out the area of internal dosimetry for a more detailed investigation of research needs. To facilitate this effort, a meeting of the Subpanel was held in June to finalize a list of experts on the subject who would meet with the Subpanel in July

to solicit their recommendations on research needs in this area. Future actions, such as conducting workshops, will be determined on the basis of that meeting.

F. Health Effects of Electromagnetic Fields

Based on a request from DOL, an ad hoc group was formed by the Science Panel to develop a work statement for an external review of the reported health hazards of exposure to electromagnetic fields, especially reports of carcinogenesis and reproductive and neurophysiological effects. The review, which is being conducted by an independent panel of experts, will focus on power frequencies (15 to 180 Hz) and video display terminal frequencies (10 to 30 kHz) because these sources appear to be of greatest public concern.

The scope of work requests the panel of experts to review and evaluate all appropriate information which address the subject matter, with primary emphasis on materials published within the last 15 years. The review of the literature is to include an evaluation of the firmness of the evidence that the electric and magnetic fields cause the reported phenomena; the biological basis for potential adverse human health effects; the dose-effect relationship between the fields and adverse human effects; the uncertainties involved in epidemiological studies; and the strengths and limitations of laboratory and theoretical studies. The work statement specifically requests the panel to address the adequacy of available data upon which to base reasonable quantitative risk assessments. While the work statement does not expressly task the panel to identify research needs, it does request the panel to identify what additional information is needed to develop such assessments.

After approving the work statement, the CIRRPC Executive Committee tasked ORAU to conduct this independent review and evaluation by a group of highly qualified scientists from the academic community. The review is scheduled for completion six months after the initial meeting of the ORAU panel in September.

The ad hoc group that developed the work statement has now been established as the CIRRPC Science Subpanel on the Health Effects of Electromagnetic Fields. It has been charged to serve as a medium for the interchange of information among Federal agencies on emerging operational and research programs, regulatory issues, and significant research reports in the field. In addition, the Subpanel will also serve as a resource for CIRRPC on activities related to ELF/EMF issues.

V SPECIAL PROJECTS AND STUDIES

A. NCRP Study on Collective Dose

The NCRP two-year study on collective dose was approved for funding in February 1990 under a contractual agreement between NCRP and ORAU. Collective dose is a basic concept used in assessing risks and regulating radiation sources. It is a topic of interest

to many Federal agencies, as well as to other national and international organizations responsible for radiation protection.

The study is being conducted by NCRP's Scientific Committee 1-3, an umbrella committee of Scientific Committee 1 on Basic Radiation Protection Criteria. Scientific Committee 1-3, headed by Mr. Ron Kathren, held its first meeting in October 1990, during which the ORAU Project Officer, Dr. William Mills, briefed them on the study's scope of work.

As proposed, the NCRP study would be 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 to be completed in relation to the study include: a review of the current applications of the collective dose concept; an examination of the scientific basis and validity for applying the concept of collective dose in 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.

After these and other related topics have been examined, CIRRPC expects the NCRP Committee to provide recommendations on the practical application of the collective dose concept, based on the knowledge of the health effects of radiation. Such recommendations would include, but not be limited to, the need and merit of collective dose calculations and the validity of collective dose as a measure of the societal impact of radiation.

An initial draft already has been completed and is currently being reviewed by the NCRP Committee; a draft for critical review within NCRP is expected in July. It is anticipated that this study on collective dose will be completed in early 1992.

B. NCRP Radon Study

In October 1990, ORAU entered into another two-year contractual arrangement with NCRP for the completion of a comprehensive report examining radon exposure levels experienced by the U.S. population and the health concerns associated with these levels.

This evaluation of occupational and environmental exposures to radon and radon decay products is being carried out by NCRP's Scientific Committee 85, headed by Dr. Naomi Harley (New York University Medical Center). Dr. Harley's recommendations regarding the Committee's membership also have been approved by the NCRP Board of Directors.

Writing assignments for chapters were made after the Committee's initial meeting with CIRRPC and ORAU representatives in April. Draft chapters are expected before the end of 1991.

C. Update and Analysis of CIRRPC Radiation Fact Sheets

Two tasks involving A Compendium of Major U.S. Radiation Protection Standards and Guides: Legal and Technical Facts have been initiated by the ORAU staff and are currently underway. The first task involves an update of the report to include new or revised standards issued since the report's publication in July 1988. New regulations in the updated document will include NRC's final standards for radiological protection (10 CFR 20) and EPA's revised final rule for the National Clean Air Act standards and proposed drinking water regulations for radionuclides (40 CFR 141-142). The second task involves an expanded analysis of the numerical limits contained in the standards cited in the report. The review and update is scheduled for completion by the end of 1991.

D. Ad Hoc Group on CIRRPC Procedures

This Ad Hoc Group was tasked by the CIRRPC Executive Committee to develop a report on CIRRPC procedures. This task stemmed from discussions during the November 8, 1990 CIRRPC meeting when it was agreed that the views of member agencies regarding CIRRPC procedures and the selection of CIRRPC officers would be solicited. Comments from both the Executive Committee and CIRRPC were carefully considered during the development of the report. The final report was transmitted in April 1991 to the CIRRPC and Science Panel representatives. Except for the inclusion of recent procedures for CIRRPC's interaction with CLSH, the report essentially codifies procedures which have been followed since CIRRPC was established.

E. Other CIRRPC Activities Related to Electromagnetic Fields

In relation to the above-mentioned activities on the reported health effects of low frequency electric and magnetic fields, other activities that CIRRPC has undertaken include an OSTP request in July 1990 for CIRRPC "to identify additional research needs, recommend agency research roles, and suggest policy alternatives where appropriate." This effort will begin after ORAU's Panel on electromagnetic fields has completed its report (see IV-F) which will provide the literature review required before research needs and roles can be addressed.

In March 1991 EPA also requested CIRRPC's member agencies to review an EPA draft report, Evaluation of the Potential Carcinogenicity of Electromagnetic Fields. This review has been completed recently, and a meeting of agency reviewers has been planned for July to develop a draft letter of transmission to EPA highlighting the agencies' major comments.

VI LEGISLATIVE MONITORING

In addition to the relevant authorization and appropriation of Acts, the following legislation of interest to CIRRPC became law in 1990-91.

- **Critical Position, Treasury, Postal Service Appropriations, H.R. 5241; P.L. 101-509**

...critical pay authority; dual compensation waivers and revolving door relief
- **Radiation Exposure Liability, H.R. 4739; P.L. 101-510**

...to provide U.S. government compensation for citizens who lived downwind of nuclear atmospheric testing...[and workers who participated in such testing]
- **Math and Science Education, H.R. 5019; P.L. 101-514**

...to provide for the promotion of math and science education
- **Clean Air Act, S. 1630; P.L. 101-549**

...to reduce emissions that contribute to acid deposition; to reduce emissions of toxic air pollutants; to bring urban areas into compliance with national standards for ozone and carbon monoxide; and to promote the use of alternative fuels
- **Hazardous Materials Transportation, S. 2936; P.L. 101-615**

...to alter the uniform Federal system of transportation regulation for the safe transportation of hazardous materials; in particular, nuclear waste

The above Public Laws of interest to CIRRPC are on file in the CIRRPC Library.

During the same period, the following nominations, also of interest to CIRRPC, were confirmed.

- **Dr. Paul Ziemer, Assistant Secretary for Environment, Safety and Health, DOE (August 1990)**
- **Mr. Calvin Kent, Administrator, Energy Information Administration, DOE (August 1990)**
- **Mr. David H. Leroy, Nuclear Waste Negotiator, DOE (August 1990)**
- **Mr. Richard A. Claytor, Assistant Secretary for Defense Programs, DOE (October 1990)**

APPENDIX A

ACRONYMS

BEIR	(Committee on the) Biological Effects of Ionizing Radiation
CEC	Commission of the European Communities
CIRRPC	Committee on Interagency Radiation Research and Policy Coordination
CLSH	Committee on Life Sciences and Health
CRCPD	Conference of Radiation Control Program Directors
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
DOT	Department of Transportation
ELF/EMF	Electromagnetic/electric and magnetic fields
EPA	Environmental Protection Agency
FCCSET	Federal Coordinating Council for Science, Engineering and Technology
FEMA	Federal Emergency Management Agency
Hz	Hertz (unit of frequency)
ICRP	International Commission on Radiological Protection
kHz	Kilohertz (unit of frequency)
LET	Linear Energy Transfer

NARM	Naturally-Occurring and Accelerator-Produced Radioactive Materials
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Agency
NCRP	National Council on Radiation Protection and Measurements
NEXRAD	Next Generation Radar
NIH	National Institutes of Health
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NWS	National Weather Service
ORAU	Oak Ridge Associated Universities
OSTP	Office of Science and Technology Policy
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USDA	U.S. Department of Agriculture

APPENDIX B

LIST OF CIRRPC MEETINGS (July 1990-June 1991)

July 1990

- 9 Science Panel
- 11 Public Education Subpanel
- 20 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel

August 1990

- 2 Science Panel Executive Committee
- 9 Executive Committee
- 13 Science Panel
- 30 Science Panel Executive Committee
- 23 Neutron Quality Factor Subpanel
- 30 Science Panel Executive Committee

September 1990

- 5 Public Education Subpanel
- 7 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 11 Ad Hoc Group on Work Statement on EM Radiation
- 17 Science Panel

October 1990

- 2 Executive Committee
- 3 Occupational Radiation Protection Research Subpanel
- 11 Science Panel Executive Committee
- 17 Ad Hoc Group on CIRRPC Reports Coordination and Procedures Group
- 23 Public Education Subpanel
- 29 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 30 Ad Hoc Group on Work Statement on EM Radiation
- 31 Occupational Radiation Protection Research Subpanel

November 1990

- 1 Executive Committee
- 8 CIRRPC Meeting
- 15 Science Panel Executive Committee
- 16 Subpanel on Health Effects of Electromagnetic Fields
- 20 Ad Hoc Group on CIRRPC Reports Coordination and Approval Procedures
- 29 Occupational Radiation Protection Research Subpanel

December 1990

- 3 Science Panel
- 6 Public Education Subpanel
- 17 NARM Subpanel
- 20 Science Panel Executive Committee

January 1991

- 3 Executive Committee
- 7 Subpanel on Recommendations on Radiological Protection
- 8 Neutron Quality Factor
- 14 Public Education Subpanel
- 16 BEIR IV Subpanel Chairman & ORAU Technical Liaison
- 17 Science Panel Executive Committee
- 23 Ad Hoc Group on CIRRPC Reports Coordination and Procedures Group

February 1991

- 1 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 4 Subpanel on Recommendations on Radiological Protection
- 4 Science Panel
- 7 Neutron Quality Factor
- 11 Public Education Subpanel
- 14 Health Effects of EM Fields Subpanel
- 21 Science Panel Executive Committee
- 21 Executive Committee
- 28 Policy Ad Hoc Group on Radiological Emergencies

March 1991

- 4 Science Panel
- 8 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 11 Public Education Subpanel
- 12 Policy Ad Hoc Group on Radiological Emergencies

March 1991 (continued)

- 14 Neutron Quality Factor
- 20 Science Panel Executive Committee
- 20 Executive Committee
- 26 Subpanel on Recommendations on Radiological Protection

April 1991

- 1 Science Panel
- 8 Public Education Subpanel
- 11 Subpanel on Recommendations on Radiological Protection
- 23 Science Panel Executive Committee
- 23 Executive Committee
- 26 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel

May 1991

- 7 Public Education Subpanel
- 9 CIRRPC Meeting
- 16 Science Panel Executive Committee
- 17 Neutron Quality Factor Writing Group
- 22 Occupational Radiation Protection Research Subpanel
- 22 Subpanel on Recommendations on Radiological Protection
- 23 NARM Subpanel

June 1991

- 3 Science Panel Workshop
- 17 Occupational Radiation Protection Research Subpanel
- 20 Science Panel Executive Committee
- 20 Executive Committee
- 21 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel

APPENDIX C

CIRRPC MEMBER AGENCIES AND REPRESENTATIVES

(as of June 30, 1991)

► **Department of Agriculture**

Dr. Mary E. Carter
Dr. James W. Glosser (Alt.)
Mr. John T. Jensen*
Dr. Ronald E. Engel* (Alt.)

► **Department of Commerce**

Mr. Raymond G. Kammer
Dr. Randall S. Caswell (Alt.)
Mr. Charles M. Eisenhower*
Dr. Bert M. Coursey* (Alt.)

► **Department of Defense**

Dr. Robert B. Barker
MG Gerald Watson (Alt.)
Dr. William J. Flor*
CAPT Robert Bumgarner* (Alt.)

► **Department of Energy**

Dr. Paul L. Ziemer
Dr. Harry Pettengill (Alt.)
Mr. C. Rick Jones (Alt.)
Dr. Robert W. Wood*
Dr. Robert G. Thomas* (Alt.)

► **Department of Health & Human Services**

Mr. James S. Benson
Dr. Marvin Rosenstein (Alt.)
Dr. Gilbert W. Beebe*
Dr. Bruce W. Wachholz* (Alt.)

► **Department of Housing and Urban Development**

Mr. Richard H. Broun
Mr. Richard J. Alexander*
(Alt. for Policy Panel)
Mr. Joel Segal* (Alt.)

► **Department of Interior**

Mr. James F. Devine
Dr. Edward Landa*

► **Department of Justice**

Mr. Stephen Bransdorfer
Mr. Jeffrey Axelrad (Alt.)

* Denotes Science Panel Member

► **Department of Labor**

Mr. Robert E. Copeland
Ms. Margie E. Zalesak, C.I.H.*
(Alt. for Policy and Science)
Dr. Sheldon R. Weiner*

► **Department of State**

Mr. Charles M. Newstead

► **Department of Transportation**

Mr. James K. O'Steen (Alt.)
Ms. Kristen S. Smith* (Alt.)

► **Department of Veterans Affairs**

Mr. Raoul L. Carroll
Mr. Robert E. Coy (Alt.)
Dr. Lawrence B. Hobson* (Alt.)

► **Environmental Protection Agency**

Dr. Gordon Burley (Alt.)
Mr. Martin Halper*
Dr. Jerome Puskin* (Alt.)

► **Federal Emergency Management Agency**

Mr. Dennis H. Kwiatkowski
Mr. Craig Wingo (Alt.)
Mr. Vernon Wingert (Alt.)
Mr. Marlow J. Stangler*
Mr. George C. Meyer* (Alt.)
Mr. Michael S. Pawlowski* (Alt.)

► **National Aeronautics and Space Administration**

Mr. Leven B. Gray
Mr. Charles W. Mertz (Alt.)
Dr. Frank Sulzman*
Dr. Donald Robbins* (Alt.)

► **Nuclear Regulatory Commission**

Dr. Bill M. Morris
Mr. Robert Bernero (Alt.)
Dr. Donald A. Cool*

► **Office of Science and Technology Policy**

Dr. D. Allan Bromley
Dr. Donald A. Henderson
Dr. Maryanne Bach
Dr. Alicia Dustira

► **Committee on Life Sciences and Health**

Dr. James O. Mason
Ms. Carolyn Fulco

* Denotes Science Panel Member

APPENDIX D

EXECUTIVE COMMITTEE

(as of June 30, 1991)

Chairman

Dr. Alvin L. Young
U.S. Department of Agriculture

Vice Chairman

Mr. Robert Bernero
Nuclear Regulatory Commission

Executive Secretary

Mr. Robert L. Brittigan
Department of Defense

Chairman, Science Panel

Dr. Randall S. Caswell
Department of Commerce

Vice Chairman, Science Panel

Dr. Marvin Rosenstein
Department of Health & Human Services

Executive Secretary, Science Panel

Dr. Lawrence B. Hobson
Department of Veterans Affairs

Technical Assistance Director

COL Everette E. Gray, US Army
Department of Energy

Mr. Thaddeus J. Dobry (Alt.)

Department of Energy

APPENDIX E

ORAU STAFF

SCIENCE AND TECHNOLOGY POLICY ASSISTANCE PROGRAM

Mr. William V. Vitale
Director

Ms. Sharron Houlihan
Executive Secretary

Ms. Brenda Campbell
Program Assistant

Administrative Staff

Mr. Edward E. Cour
Sr. Administrative Officer

Mr. Dan Gallagher
Computer Specialist

Ms. Elcy Leshley
Office Assistant

Ms. Marcie March
Receptionist

Technical Staff

Dr. William A. Mills
Sr. Scientist/Policy Advisor

Mr. David S. Smith
Technical Analyst

Ms. Diane S. Flack
Technical Advisor

Ms. Mary Grace L. Belcher
Program Associate

Ms. Cathy D. Law
Technical Secretary

Ms. Delores Bigby
Technical Secretary

APPENDIX F

LIST OF COMPLETED REPORTS 1984-91

1. DVA Assessment of Veterans with Military Service at Sites of Temporarily Augmented Ionizing Radiation
2. Review of the Draft Report of the National Institutes of Health Ad Hoc Working Group to Develop Radioepidemiological Tables
3. Review of the Report of the National Institutes of Health Ad Hoc Working Group to Develop Radioepidemiological Tables
4. Report on Identification of Federal Radiation Issues
5. International Activities Report
6. Radon Protection and Health Effects
7. SI Metric Radiation Units
8. Update of the International Activities Report
9. The Federal Ionizing Radiation Research Agenda Related to Low Level Biological Effects: FY85
10. Review of Scope 28 Report on Environmental Consequences of Nuclear War: Volume II, Ecological and Agricultural Effects
11. Federal Programs on Indoor Radon
12. Use of Probability of Causation by the Veterans Administration in the Adjudication of Claims of Injury Due to Exposure to Ionizing Radiation
13. A Compendium of Major U.S. Radiation Protection Standards and Guides: Legal and Technical Facts
14. Report of the Ad Hoc Planning Group
15. Planning for Human Health Effects Research in the Event of a Nuclear Accident
16. Ionizing Radiation Risk Assessment (BEIR IV)

APPENDIX G

POLICY AND SCIENCE SUBPANEL PARTICIPANTS

(as of June 30, 1991)

► **Policy Subpanel on
Radioepidemiological Tables**

Dr. Robert B. Barker, DOD
(Chairman)
MAJ Ken Gilbert (Alt.), DOD
Mr. Robert Brittingham, DOD
(Alt. Chairman)
Mr. Richard Staufenberger, DOL
Ms. Ruth Berger (Alt.), DOL
Mr. Richard J. Riseberg, HHS
Mr. Bob Lanham (Alt.), HHS
Ms. Sandra Schneider, DOE
Ms. Martha Crossland (Alt.), DOE
Mr. Henry Gill (Alt.), DOE
Mr. Mark Johnston (Alt.), DOE

► **Policy Subpanel on Public Education**

Mr. Leven B. Gray (Chairman), NASA
Dr. Ronald E. Engel, USDA
Dr. James A. Grundl, DOC
Mr. John Inzana, DOL
LT COL Chris Johnson, DOD
Dr. Edward Landa, DOI
Ms. Jeannine T. Lewis, HHS
Mr. James Malaro, NRC
Dr. Bill M. Morris, NRC
Mr. David Rowson, EPA
Mr. Joel Segal, HUD
Mr. Marlow J. Stangler, FEMA
Mr. Allan B. Tanner, DOI
Mr. Andrew Wallo, III, DOE
Dr. Kenneth Mossman (Consultant)

► **Ad Hoc Group on Work Statement on
EM Radiation**

Dr. Robert McGaughy (Chairman), EPA
Dr. John O. de Lorge, DOD
CDR Robert Yacovissi, MSC, USN
(Alt.)
Dr. Sheldon Weiner, DOL
Dr. Charlotte Silverman, HHS
Dr. Imre Gyuk, DOE
Mr. John C. Monahan, HHS
Ms. Janet Healer, DOC

► **Science Subpanel on High-LET
Radiation**

Dr. Bruce W. Wachholz, HHS
(Chairman)
CDR Eric Kearsley, DOD
Dr. Lawrence S. Myers, Jr.,
(Consultant)

► **Task Group on High-LET Radiation**

Dr. Leslie A. Braby
Battelle Northwest
Dr. Johan Broerse
Institute of Applied Radiobiology
and Immunology, The Netherlands
Dr. Mortimer M. Elkind
Radiology and Radiation Biology
Colorado State University
Dr. Dudley Goodhead
Medical Research Council
United Kingdom
Dr. Nancy L. Oleinick
Division of Biochemical Oncology
University Hospitals
Case Western Reserve University

► **Science Subpanel on Scientific Basis
for Radiation Protection Standards**

Dr. Robert G. Thomas, DOE
CAPT David George, DOD

► **Working Group to Address NARM
Regulations**

Dr. Mary E. Carter, USDA
(Chairman)
Mr. R. Thomas Bell, DOD
COL David R. Case, USAF
Dr. Sheldon R. Weiner, DOL
Mr. J. William Gunter, EPA
Dr. Cynthia G. Jones, NRC
Dr. Donald Thompson, FDA
Dr. William H. Bland, DVA
Mr. Floyd L. Galpin, EPA (Alt.)
Mr. Kenneth Ferlic, DOE (Alt.)
Mr. Alan K. Roecklein, NRC (Alt.)
CDR William J. Flor, Ph.D., DOD (Alt.)

► **Science Subpanel on Occupational
Radiation Protection Research**

Mr. R. Thomas Bell, DOD
(Chairman)
Dr. Joel Rabovsky, DOE
Ms. Charleen Raddatz, NRC
Mr. John Ahlquist, DOE
Dr. Judith Foulke, DOE
Ms. Jeannine T. Lewis, HHS
Mr. Lester Slaback, DOC
Dr. Sheldon R. Weiner, DOL
Dr. Matt Varma, DOE
LT Lino L. Fragoso, DOD

► **Science Subpanel on Use of BEIR V
and UNSCEAR 1988 in Risk
Assessment**

Dr. Marvin Rosenstein, HHS
(Chairman)
CAPT William J. Flor, Ph.D., DOD
Dr. Gilbert W. Beebe, HHS
Mr. Anthony A. Weadock, DOE
Dr. Daniel Hoffman, HHS
Mr. Christopher Nelson, EPA
Dr. Frank J. Congel, NRC
Mr. Charles A. Willis, NRC (Alt.)

► **Science Subpanel on Ionizing
Radiation Risk Assessment (BEIR
IV)**

Dr. Robert Thomas, DOE
(Chairman)
Dr. Richard A. Albanese, DOD
Dr. Jerome Puskin, EPA
Dr. James M. Smith, HHS
Dr. Shlomo Yaniv, NRC