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CIRRPC
SIXTH ANNUAL REPORT

June 30, 1990

Alvin L. Young, Chairman

**Committee on Interagency Radiation
Research and Policy Coordination**

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

MASTER

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NOTICES

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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; Office of Management and Budget; and the National Security Council.*

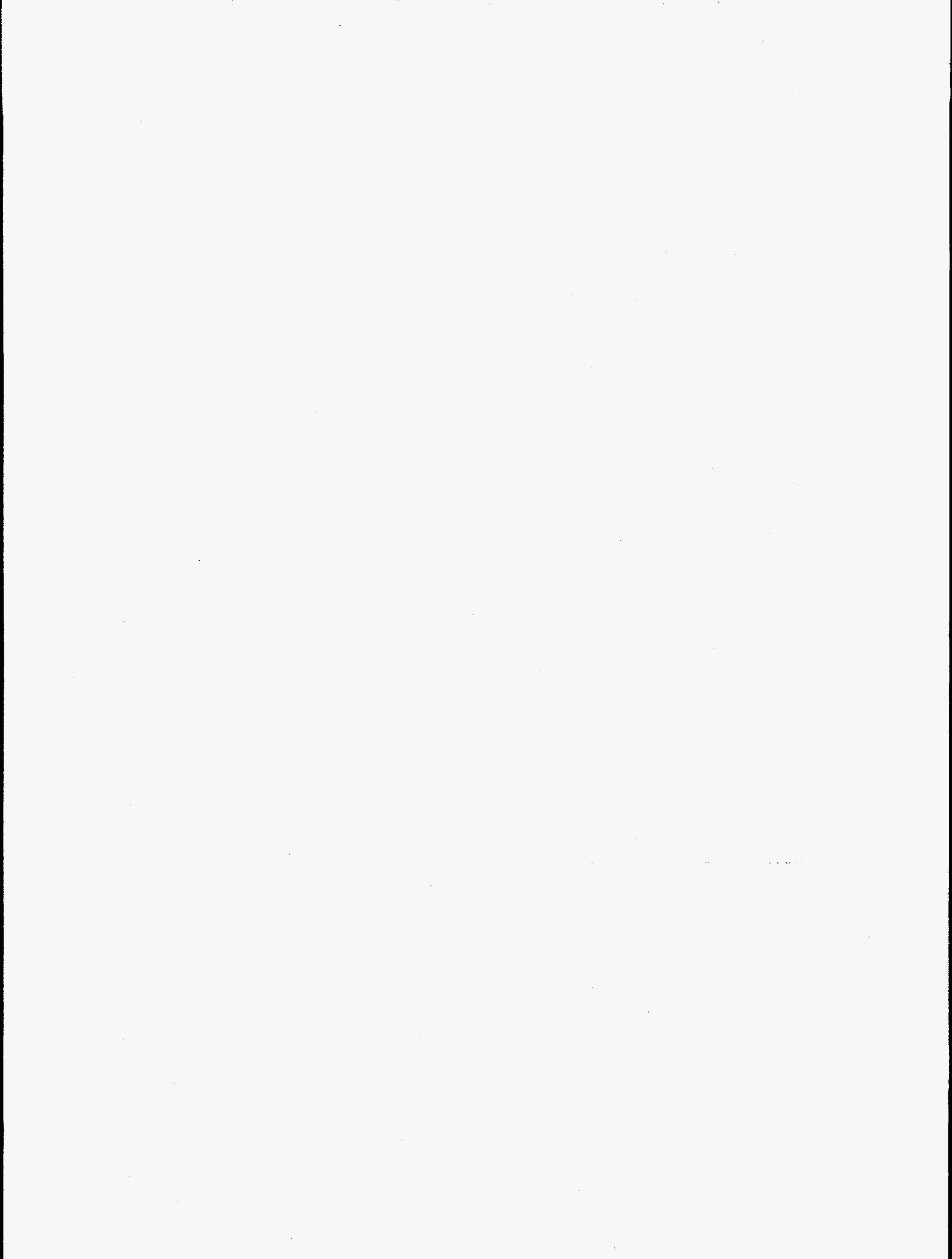
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COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION

Sixth Annual Report

July 1, 1989 to June 30, 1990

I. EXECUTIVE SUMMARY

The Committee on Interagency Radiation Research and Policy Coordination (CIRRPC),¹ a committee of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET) has completed its sixth year of operation. It continues to be an important forum for the exchange of information on national radiation issues, such as the implementation of the CIRRPC-sponsored National Research Council/National Academy of Sciences' report on *Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V* and the annual review of Federal radon programs. A list of CIRRPC meetings held during the last year to discuss Federal radiation issues is contained in Appendix B.

With the establishment of three new subpanels during the last year, CIRRPC is currently addressing more issues than at any time since its establishment. Recently initiated subpanels are addressing public education, possible adverse health effects from electromagnetic radiation, and national and international recommendations on radiological protection. In addition, a contract has been given to the National Council on Radiation Protection and Measurements to develop a report on the use of the collective dose concept.

Three CIRRPC efforts were brought to completion this last year. One of this year's highlights was the publication of the BEIR V report cited above. This report provides a comprehensive review of up-to-date risk estimations to be used in assessing potential health effects from exposure to ionizing radiation. Also completed for publication during this period was CIRRPC Science Panel Report No. 7, *Planning for Human Health Effects Research in the Event of a Nuclear Accident*. Efforts of the Subpanel addressing the policy implications and use of the National Institutes of Health Radioepidemiological Tables were terminated following the Subpanel's unanimous conclusion that further effort to develop a consensus report was unnecessary because the scientific limitations upon the uses of the Tables had already been correctly described in several publications, and there were no indications of any significant instances of the Tables being misused (see Section VI.A.).

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

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

The continued success of CIRRPC was noted in several ways last year. The Office of Science and Technology Policy (OSTP), Executive Office of the President, recognized CIRRPC's past performance and future role in coordinating national radiation issues at both of the CIRRPC policy meetings. CIRRPC was recognized as one of the most successful FCCSET committees by both Dr. D. Allan Bromley, Assistant to the President for Science and Technology and Director of OSTP, and Dr. James Wyngaarden, Associate Director for Life Sciences, OSTP, at the September 11, 1989 and May 3, 1990 meetings, respectively.

With the continued strong support of both the Federal agencies and OSTP, during the seventh year it is anticipated that among CIRRPC's accomplishments will be the publication of reports on health risk assessment reviews, Federally-supported radiation protection research needs, and, a review of human health risks hazards reported to be associated with exposures to low frequency electromagnetic fields.

II. INTRODUCTION

CIRRPC was chartered on April 9, 1984 under FCCSET and reports to OSTP, Executive Office of the President (see Chart 1). CIRRPC's overall charge is to coordinate radiation matters between agencies, to evaluate radiation research, and to provide advice on the formulation of radiation policy. In order to carry out these purposes, CIRRPC serves as a forum where its members, having policy or scientific roles in either the regulation or use of radiation, discuss and resolve issues to best serve national interests.

There are 18 CIRRPC member agencies represented on the Committee by a subcabinet or senior policy representative (see Appendix C). A Chairman, Vice Chairman and Executive Secretary serve as the officers of the Committee and represent the main Committee on the CIRRPC Executive Committee. CIRRPC meets two to three times a year to address radiation policy issues. The representatives also provide the final review and approval of the reports developed by the policy and science subpanels.

Fourteen of the member agencies are represented by senior scientists on the CIRRPC Science Panel (see Appendix C). As with the CIRRPC policy body, the Science Panel has a Chairman, Vice Chairman and Executive Secretary who provide leadership to the Science Panel and represent the Science Panel on the CIRRPC Executive Committee.

The Science Panel schedules monthly meetings to discuss scientific issues of mutual interest, to be briefed on actions and programs within the agencies, and to act on reports developed by the science subpanels.

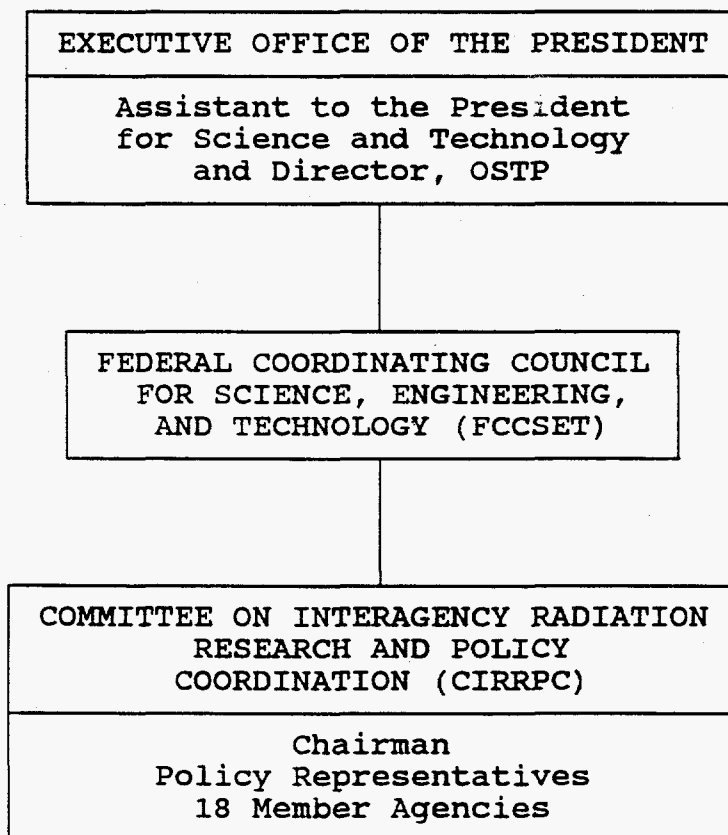
The CIRRPC Executive Committee schedules monthly meetings and is responsible for the overall planning and management of CIRRPC's programs and resources. It is comprised of the CIRRPC and Science Panel officers listed above, plus the Department of Energy (DOE) Technical Director (see Appendix D). The 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 (see Appendix E). Funding for this contract is provided by the CIRRPC member agencies.

CIRRPC addresses issues in response to requests from member agencies or OSTP, or that are of overall interest to CIRRPC or its Science Panel. Once a specific issue has been brought to CIRRPC's attention, either a policy or science subpanel is established and tasked with developing a report on the issue. The work of the subpanels is guided by statements of work which have been approved by the CIRRPC Executive Committee. Names for membership on the subpanels are submitted by those Federal agencies having a specific interest in the issue to be addressed by the subpanel. At times, task groups or outside (non-Federal) consultants are used when additional expertise is needed or a non-Federal position on an issue is required.

Following development of a subpanel's report on an issue, the report is approved by CIRRPC, and by the CIRRPC Science Panel if the report addresses a scientific issue, prior to its transmittal to OSTP and the requesting agency. A list of published CIRRPC reports is provided in Appendix F, and issues currently being addressed are in Sections VI, VII and VIII.

CHART 1

CIRRPC'S LOCATION IN EXECUTIVE BRANCH



III. CIRRPC ACTIVITIES

The CIRRPC members met twice during the past year. On September 11, 1989, Dr. D. Allan Bromley, Assistant to the President for Science and Technology and the Director of OSTP, presented remarks in which he congratulated CIRRPC on its five years of accomplishments. Dr. Bromley challenged the Committee to continue its work in coordinating radiation matters. He listed three areas of particular interest to OSTP in the coming months: 1) management of radioactive waste, specifically site cleanup; 2) coordination of proposed changes to the interim protective action guides for protection of the public health and safety in case of a nuclear accident; and 3) treatment of risk assessment and risk management with realism in the area of conservatism versus cost. Dr. Arthur C. Upton, Chairman of the BEIR V Committee, presented a prepublication summary of the National Academy of Sciences' report on the biological effects of ionizing radiation, BEIR V. For a summary of the report's findings see Section VIII.A. Dr. Charles

Eisenhower reviewed the findings of the Science Subpanel draft report entitled *Planning for Human Health Effects Research in the Event of a Nuclear Accident*. This report was subsequently approved by the membership for publication as CIRRPC Science Panel Report No. 7 (see Section VII.C). During the open discussion, Dr. Randall S. Caswell, CIRRPC Science Panel Chairman, raised the issue of public education on the health effects of radiation. Following a brief discussion, the members agreed to have the Executive Committee develop a formal charge for a policy subpanel and submit it to the member agencies for approval.

The second meeting of CIRRPC this past year was held May 3, 1990. Dr. Alvin L. Young, Chairman, reported on the status of the three issues raised by Dr. Bromley at the September meeting: the CIRRPC Executive Committee had followed up on the issue of radioactive waste management through a briefing by DOE's Office of Environmental Restoration and Waste Management; on the issue of reasonable levels of protection of public health, should a significant nuclear incident occur, CIRRPC met with the Commission of the European Communities (CEC) on their experience; and relative to the final issue of a need for realism in risk assessments and a need to educate the public, he noted that CIRRPC had formed subpanels on both issues and was intensively reviewing BEIR, ICRP, and UNSCEAR reports. Dr. James Wyngaarden, Associate Director for Life Sciences, OSTP, briefed CIRRPC on the current organization of OSTP, the Federal Coordinating Council for Science, Engineering and Technology, and CIRRPC's responsibilities and activities. Highlights of the September meeting also included the Federal agencies' responses to the publication of BEIR V and the annual review of Federal radon activities.

In June 1990, CIRRPC participated in a joint briefing with the National Council on Radiation Protection and Measurements (NCRP) and the International Commission on Radiological Protection (ICRP) on the draft ICRP 1990 recommendations on radiological protection.

IV. CIRRPC EXECUTIVE COMMITTEE ACTIVITIES

Major actions taken by the Executive Committee during the sixth year of CIRRPC operation included:

- Approval of the funding of a collective dose study by the NCRP (see Section VIII.B).
- Approval of the establishment of a policy subpanel on Public Education (see Section VI.C).
- Preparation of a draft report by a subgroup of the Executive Committee on the Environmental Protection Agency's (EPA) proposed air emission standards for controlling radioactivity releases involved in the practice of nuclear medicines

and the manufacture of radiopharmaceuticals, at the request of Dr. James Wyngaarden, OSTP.

- Approval of the establishment of a policy/science subpanel on Recommendations on Radiological Protection (see Section VI.D).
- Agreement to the dissolution of the Subpanel on Policy Implications Associated with the Use of the Radioepidemiological Tables Developed by NIH (see Section VI.A).
- Agreement to the transmittal to Dr. D. Allan Bromley of CIRRPC Science Report No. 7 entitled *Planning for Human Health Effects Research in the Event of a Nuclear Accident* (see Section VII.C).
- Agreement to the Science Panel establishing an ad hoc group to write a work statement for an external study, by an independent group of experts, of the health risks to humans from exposure to electromagnetic fields (see Section VII.G).

On January 16 and 17, 1990, Dr. Alvin L. Young (CIRRPC Chairman), Mr. Robert L. Brittigan (Executive Secretary), and Capt. Jay G. McDonald (Technical Assistance Director) met with the Department of Energy (DOE) Oak Ridge Operations Office (ORO) staff and the ORAU management staff to review ORAU's performance under the CIRRPC task. It was concluded that ORAU's performance has been outstanding. ORO also expressed its continuing high confidence in ORAU's ability to handle both technical and business issues for CIRRPC.

V. SCIENCE PANEL ACTIVITIES

The Science Panel met eight times during this period to monitor and discuss the progress of the CIRRPC science subpanels and to be briefed on scientific programs of the Federal agencies and other national and international organizations. The progress within the science subpanels is presented in Section VIII.

Briefings to the Science Panel included issues such as the U.S.-U.S.S.R. cooperative efforts for health and environmental studies; the DOE long-term animal studies; the National Research Council/National Academy of Sciences' report on *Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V*; public media reports on concerns about possible human health effects due to electromagnetic radiation; the DOE/NIH human genome project; NCRP guidance on radiation received in space activities; Federal guidance for radiation protection of the general public; the draft 1990 ICRP recommendations on radiological protection; the U.S. Global Change Research Program; and Nuclear Regulatory Commission's policy statement on levels of radiation exposure that are below regulatory concern.

VI. CIRRPC POLICY SUBPANEL ACTIVITIES

During this reporting period, two new policy subpanels were established to address issues related to public information on radiation and its health effects and to national and international recommendations on radiological protection. Action was taken to disestablish the subpanel looking at policy issues related to the radioepidemiological tables.

A complete list of the policy subpanel participants is provided in Appendix G.

A. Radioepidemiological Tables

This Subpanel was established to prepare a report on the policy implications of the promulgation and use of the National Institutes of Health (NIH) Radioepidemiological Tables for radiation compensation purposes. Following publication of a Science Panel report on this issue, this Subpanel examined: how the concept of probability of causation for radiation injury might be used in tort litigation and in the processing of workmen's compensation claims; and the impacts resulting from limitations or misuse of the radioepidemiological tables.

After careful deliberation, the chairman of the Subpanel notified CIRRPC's Chairman that further efforts to achieve consensus on a report would not be worthwhile. In reaching this unanimous conclusion, the members of the Subpanel noted that the scientific limitations upon the uses of the Tables already have been described correctly in several publications. Therefore, the reiteration of these limitations in yet another report would be redundant. The Subpanel also concluded that there are no present indications of any significant instances of the Tables being misused. The Subpanel further noted that the termination of their efforts and the dissolution of the Subpanel should in no way be considered as reflecting a negative judgement on the NIH Report or any of the related scientific reports. This recommendation was accepted by the Executive Committee and the Subpanel was disestablished.

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

The creation of this Subpanel was in response to a request from the Chairman of the Nuclear Regulatory Commission to the Director of OSTP to have CIRRPC examine the need for Federal regulation of "discrete" sources of Naturally-Occurring and Accelerator-Produced Radioactive Materials (NARM). Previously, the Conference of Radiation Control Program Directors (CRCPD) had requested the Nuclear Regulatory Commission to seek legislative authority to regulate those sources of NARM. A report was drafted by the Subpanel which includes recommendations on 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 report and recommendations of the Subpanel are under review by the CIRRPC member agencies.

C. Public Education

In October 1989 a new Subpanel was formed to examine education in the area of radiation. The Subpanel's principal objective is to develop a coherent and coordinated Federal policy on public information on radiation and its health effects. Initial activities of the Subpanel have included a review of public information and education activities of the Federal agencies and meetings with nuclear industry staff involved in educational programs and public relations groups involved in nuclear energy-related work. The most recent efforts of the Subpanel have focused on defining objectives, organizing, and planning a workshop to address public education issues.

D. Recommendations on Radiological Protection

Establishment of a Subpanel on Recommendations on Radiological Protection was approved by the Executive Committee in June. This Subpanel will assist the CIRRPC member agencies in keeping abreast of recommendations and other statements of the principal radiation protection organizations, such as ICRP and NCRP. This Subpanel will be a combination of science and policy members so it will include both representatives responsible for developing radiation protection documents for the Federal government and people who understand the rationale behind the recommendations. The Subpanel will monitor the progress towards the adoption of revised recommendations, become conversant with the new features of these recommendations and provide status reports to the CIRRPC members. In addition, it will serve as the focal point for: CIRRPC member discussion and reaction to the recommendations; the identification of issues; and proposals for those activities CIRRPC should undertake with regard to the new recommendations.

VII. SCIENCE SUBPANEL ACTIVITIES

During the last year, the Science Subpanel on Pre-Disaster Planning for Human Health Effects Research completed its final report entitled *Planning for Human Effects Research in the Event of a Nuclear Accident* and several other subpanels transmitted their draft reports to the Science Panel for review. The Science Panel set up a new ad hoc group to write a work statement for an external study of the human health effects from electromagnetic fields.

A complete list of the science subpanel participants is provided in Appendix G.

A. Scientific Basis for Radiation Protection Standards

This Subpanel was initially set up to examine the scientific basis of recommendations in ICRP Report 26. However, due to the complexity and controversy of the issue, the

efforts of this Subpanel have focused solely on the recommendations from the ICRP (1985) and NCRP (1987) to increase the quality factor of neutrons (Q_n) by a factor of two, thereby increasing the recommended Q for fast neutrons from 10 to 20. The Subpanel reviewed this matter by examining the basis and role of Q_n in radiation protection and the experimental data relevant to selection of an appropriate value. In its earlier draft report, *The Neutron Quality Factor*, the Subpanel concluded that an increase in Q_n is not warranted without further consideration since neutrons have not been clearly shown to be more effective in producing biological effects than previously assumed. Following review of the report by the CIRRPC Science Panel, the report is being revised to incorporate the Federal agencies' comments. Although the comments require a significant revision of the draft report, the principal conclusion of no change in Q_n at this time remains unchanged.

This Subpanel will be dissolved following publication of the report on neutron quality factor. Future issues surrounding radiation protection standards will be addressed by the newly established CIRRPC Subpanel on Recommendations on Radiological Protection (see Section VI.D).

B. High-LET Radiation

The Subpanel on High-LET Radiation was initially established to monitor the status of research and analyses addressing these types of radiations and their biological effectiveness. Currently, the Subpanel is responding to a DOE request to develop a research program to provide a basis for more precisely determining 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 task group made up of consultants from both the U.S. and European research communities to address the issue. The task group has 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. Following revision of the draft report to reflect the task group's final comments, the report will be submitted to the Science Panel and other peer reviewers for comment.

C. Planning for Human Health Effects Research in the Event of a Nuclear Accident

This Subpanel was charged with the task of addressing the feasibility of planning for the collection of vital health-related information in the event of nuclear accidents. The Subpanel report, *Planning for Human Effects Research in the Event of a Nuclear Accident*, was approved in June 1990 by the CIRRPC member agencies and will be published as CIRRPC Science Panel Report No. 7. The report recommends for a pre-disaster planning effort to organize the collection of health-related information. The report specifically notes that it was beyond the Subpanel's responsibility to determine how existing emergency preparedness procedures might need to be modified. Therefore, the Subpanel

recommended a follow-up effort to develop recommendations for implementing a pre-disaster effort. The Subpanel further noted that before CIRRPC makes a formal recommendation for initiation of an interagency effort, that the associated policy, financial and other questions identified in the subpanel report be resolved at the policy level. In order to address the issues identified by the Subpanel and those raised by member agencies in the final review, a Policy Ad Hoc Group was approved by the Executive Committee.

D. Ionizing Radiation Risk Assessment (BEIR IV)

In response to a DOD request that CIRRPC assist in the development of a coordinated Federal position on risk assessment, several science subpanels have been established to review the major scientific reports on the biological effects of radiation. The initial Subpanel established in response to this request was tasked with a review of the risk factors in the National Academy of Sciences' report entitled *Health Risks of Radon and other Internally Deposited Alpha-Emitters: BEIR IV*. The Subpanel was tasked to evaluate the impact of the uncertainties identified in the BEIR IV report on its application to Federal risk assessments; identify the Federal radiation activities to which the BEIR IV scientific analysis might be applied; and provide the Science Panel with a report on the potential for consistent use of BEIR IV in Federal risk assessments.

A draft subpanel report was sent to the Science Panel for review and comment in March 1990. The report noted the emphasis given to radon in BEIR IV and the lack of a basis on which the subpanel could make definitive recommendations for other alpha-emitters.

The report was being prepared for resubmission to the Science Panel for approval at the end of the report period.

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

This Subpanel was established to facilitate the use of the National Academy of Sciences' report entitled *Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V* and the United Nations' UNSCEAR 1988 report entitled *Sources, Effects and Risks of Ionizing Radiation* in a coordinated manner by those agencies having responsibilities to perform risk assessments related to ionizing radiation exposures. The Subpanel has held a series of meetings to discuss the health effects information extracted from the two reports, the issues associated with this information, and proposed statements on risk estimates and risk status for each health effect.

F. Occupational Radiation Protection Research

By letter to CIRRPC, the Nuclear Regulatory Commission indicated the need for interagency coordination in radiological health protection research. The CIRRPC Subpanel established in response to this letter has recently completed a draft report entitled *National*

Priorities for Occupational Radiation Protection Research. This report 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 identified as being especially important to worker protection are:

- 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 proposes that these research needs should be expedited by multiagency focus, priority emphasis and possible joint funding. To help in obtaining the focus, the Subpanel proposes that a series of scientific workshops (one on each research area) be held. In addition, the Subpanel proposes that it continue to meet to help coordinate and channel information; review possible interagency funding mechanisms; update the research priorities; and interact with other groups interested in occupational radiation protection research. The draft report is being revised in response to comments received as a result of review by the CIRRPC Science Panel.

G. Ad Hoc Group to Develop a Work Statement on the Health Effects of EM Radiation

Based on a request from the Department of Labor (DOL), an ad hoc group was formed by the Science Panel to develop a work statement for an external study, by an independent panel of experts, of the reported health hazards exposure to electromagnetic (EM) fields, especially reports of carcinogenesis, and reproductive and neurophysiologic effects. The review 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 panel is specifically requested to provide conclusions concerning any associated health hazard as to the adequacy of the available data upon which to base reasonable quantitative risk assessments. While the work statement does not specifically task the panel to identify research needs, it does request what additional information is required to develop such assessments. The work statement is currently under review by the Science Panel. OSTP requested CIRRPC to give priority to this issue and, thus, solicitation of panel members is concentrating on experts willing to devote the time and effort needed to complete their task within six months.

VIII. SPECIAL PROJECTS AND STUDIES

CIRRPC continues to provide support for external studies when the issue requires either a very broad base of expertise or an independent (non-Federal) assessment of the issue. One of CIRRPC's highlights this past year was the publication of *Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V*, which was entirely funded by the CIRRPC member agencies.

A. The Effects on Populations of Exposure to Low Levels of Ionizing Radiation: BEIR V

The National Research Council/National Academy of Sciences' report on the biological effects of ionizing radiation, BEIR V, was completed and released to the public at a press conference in December 1989. This comprehensive review provides up-to-date risk estimates to be used in assessing potential health effects from exposure to ionizing radiation.

As noted earlier, CIRRPC established a science subpanel to seek a Federal consensus on the use, for the purpose of risk assessment, of the risk estimates of health effects from low level radiation exposure from the BEIR V report as well as from the United Nations' UNSCEAR 88 report (see Section V.E). The potential impact of the report on the programs/responsibilities of the Federal agencies was a topic of discussion at the May 1990 CIRRPC policy meeting.

B. Collective Dose

Following approval of the CIRRPC Executive Committee, funding has been provided to the National Council on Radiation Protection and Measurements (NCRP) for a two-year collective dose study. Collective dose is a topic of interest to many Federal agencies, as well as other national and international organizations responsible for radiation protection.

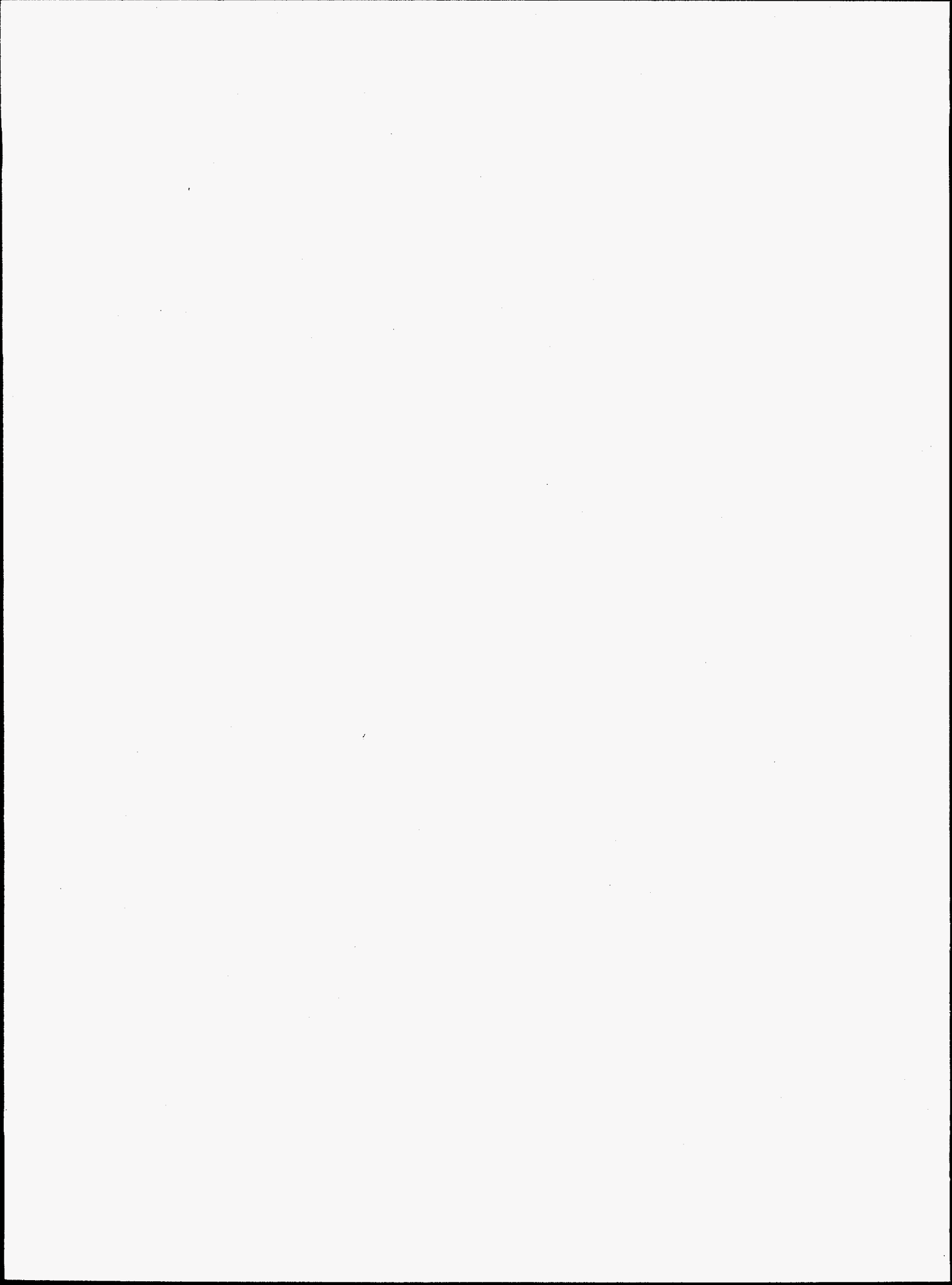
As proposed, the study would critically review the concept of collective dose relative to its use in controlling radiation exposure and in assessing health risks resulting from such exposures. Specific tasks to be completed include: review of current applications of the collective dose concept; examination of the scientific basis and validity for applying the concept of collective dose in radiation protection and risk assessment; and examination of the meaning and usefulness of the collective dose concept as used in protection of both workers and members of the general public. Following examination of these and related topics, the Council recommendations are expected 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.

C. Analysis of CIRRPC Radiation Fact Sheets

Two tasks involving *A Compendium of Major U.S. Radiation Protection Standards and Guides: Legal and Technical Facts* are underway by the ORAU staff. The first task involves an updating of the report to include new/revised standards issued since publication of the report in July 1988. A second task involves further analysis of the numerical limits contained in the standards. Initial efforts and thoughts relative to this effort were presented at the annual meeting of the American Nuclear Society.

IX. LEGISLATIVE MONITORING

In this reporting year, none of the legislation of direct interest to CIRRPC became law. Of general interest, Congress did pass the "Government Ethics Reform Act of 1989," (P.L. 101-194) which has a number of changes to post-employment restrictions on the Executive Branch, and for the first time, has placed post-employment restrictions on the Legislative Branch.



APPENDIX A
LIST OF 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
CRCPD	Conference of Radiation Control Program Directors
DOD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
EM	Electromagnetic
EPA	Environmental Protection Agency
FCCSET	Federal Coordinating Council for Science, Engineering and Technology
Hz	Hertz (unit of frequency)
ICRP	International Commission on Radiological Protection
LET	Linear Energy Transfer
NARM	Naturally-Occurring and Accelerator-Produced Radioactive Materials
NAS	National Academy of Sciences
NCRP	National Council on Radiation Protection and Measurements
NIH	National Institutes of Health
NRC	Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities

ORO	Oak Ridge Operations Office (DOE)
OSTP	Office of Science and Technology Policy
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation

APPENDIX B
LIST OF MEETINGS

JULY 1989

- 13 Executive Committee
- 13 Science Panel Executive Committee
- 19 Occupational Radiation Protection Research Subpanel

AUGUST 1989

- 14 Science Panel
- 17 Executive Committee
- 23 Occupational Radiation Protection Research Subpanel

SEPTEMBER 1989

- 7 Science Panel Executive Committee
- 7 Executive Committee
- 11 CIRRPC
- 12 BEIR IV Risk Assessment Subpanel
- 20 Occupational Radiation Protection Research Subpanel
- 25 Science Panel Executive Committee

OCTOBER 1989

- 4 Occupational Radiation Protection Research Subpanel
- 5 Executive Committee
- 16 NARM Working Group
- 16 Science Panel
- 18 Occupational Radiation Protection Research Subpanel

OCTOBER 1989 (cont'd.)

- 27 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 27 Briefing for DOE's Secretarial Panel for the Evaluation of Epidemiologic Research Activities

NOVEMBER 1989

- 1 Occupational Radiation Protection Research Subpanel
- 6-8 High-LET Task Group
- 9 Executive Committee
- 16 Science Panel Executive Committee
- 24 Briefing by Commission of European Communities Staff on Intervention Levels Following Nuclear Incidents

DECEMBER 1989

- 4 Science Panel
- 7 Executive Committee
- 13 Occupational Radiation Protection Research Subpanel
- 14 Science Panel Executive Committee

JANUARY 1990

- 8 Science Panel
- 16 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 18 Science Panel Executive Committee
- 24 Public Education Subpanel
- 25 Occupational Radiation Protection Research Subpanel

FEBRUARY 1990

- 8 Executive Committee
- 12 Science Panel
- 20 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 21 Occupational Radiation Protection Research Subpanel
- 22 Science Panel Executive Committee
- 27 Public Education Subpanel

MARCH 1990

- 5 Science Panel
- 13 Executive Committee
- 14 Occupational Radiation Protection Research Subpanel
- 20 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 21 Public Education Subpanel
- 22 Science Panel Executive Committee

APRIL 1990

- 5 Executive Committee
- 16 Science Panel
- 19 Science Panel Executive Committee
- 25 Ad Hoc Group on Work Statement on EM Radiation
- 26 Public Education Subpanel
- 27 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel

MAY 1990

- 1 Working Group to Address NARM Regulations
- 3 CIRRPC Policy Panel
- 14 Science Panel Executive Committee
- 30 Public Education Subpanel

JUNE 1990

- 1 Use of BEIR V and UNSCEAR 1988 in Risk Assessment Subpanel
- 4 Science Panel
- 18 Science Panel Executive Committee
- 18 Executive Committee
- 19 Ad Hoc Group on Work Statement on EM Radiation
- 21 ICRP/NCRP/CIRRPC Meeting on 1990 Draft Recommendations on Radiological Protection
- 28 Nuclear Regulatory Commission Briefing on Below Regulatory Concern (BRC) with CIRRPC Member Agencies Representatives

APPENDIX C

CIRRPC MEMBER AGENCIES AND REPRESENTATIVES (as of June 30, 1990)

■ Department of Agriculture

Dr. Mary E. Carter
Dr. James W. Glosser (Alt.)
Dr. Jane F. Robens*
Dr. Ronald E. Engel* (Alt.)

■ Department of Commerce

Mr. Raymond G. Kammer
Dr. Randall S. Caswell (Alt.)
Mr. Charles M. Eisenhower*
Dr. George P. Lamaze* (Alt.)

■ Department of Defense

Dr. Robert B. Barker
MG Gerald Watson (Alt.)
Mr. R. Thomas Bell*
COL George Irving, III* (Alt.)

■ Department of Energy

Mr. Peter N. Brush
Dr. Harry Pettengill (Alt.)
Dr. Robert W. Wood*
Dr. Robert G. Thomas* (Alt.)

■ Department of Health & Human Services

Mr. John C. Villforth
Dr. Marvin Rosenstein (Alt.)
Dr. Gilbert W. Beebe*
Dr. Bruce W. Wachholz* (Alt.)

■ Department of Housing and Urban Development

Mr. Richard H. Broun
Mr. James F. Miller*
(Alt. for Policy Panel)
Mr. Joel Segal* (Alt.)

■ Department of Interior

Dr. Eugene Roseboom, Jr.
Mr. Allan B. Tanner*

■ 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**

Ms. Elaine E. Joost
Mr. Michael E. Wangler*
(Alt. for Policy Panel)
Ms. Kristen S. Smith* (Alt.)

■ **Department of Veterans Affairs**

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

■ **Environmental Protection Agency**

Mr. Richard J. Guimond
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. Percival D. McCormack*
Mr. E.G. Stassinopoulos* (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. Judith L. Bostock
Mr. Karl Erb

* Denotes Science Panel Member

APPENDIX D

EXECUTIVE COMMITTEE
(as of June 30, 1990)

Chairman

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

Vice Chairman

Mr. Richard J. Guimond
Environmental Protection Agency

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

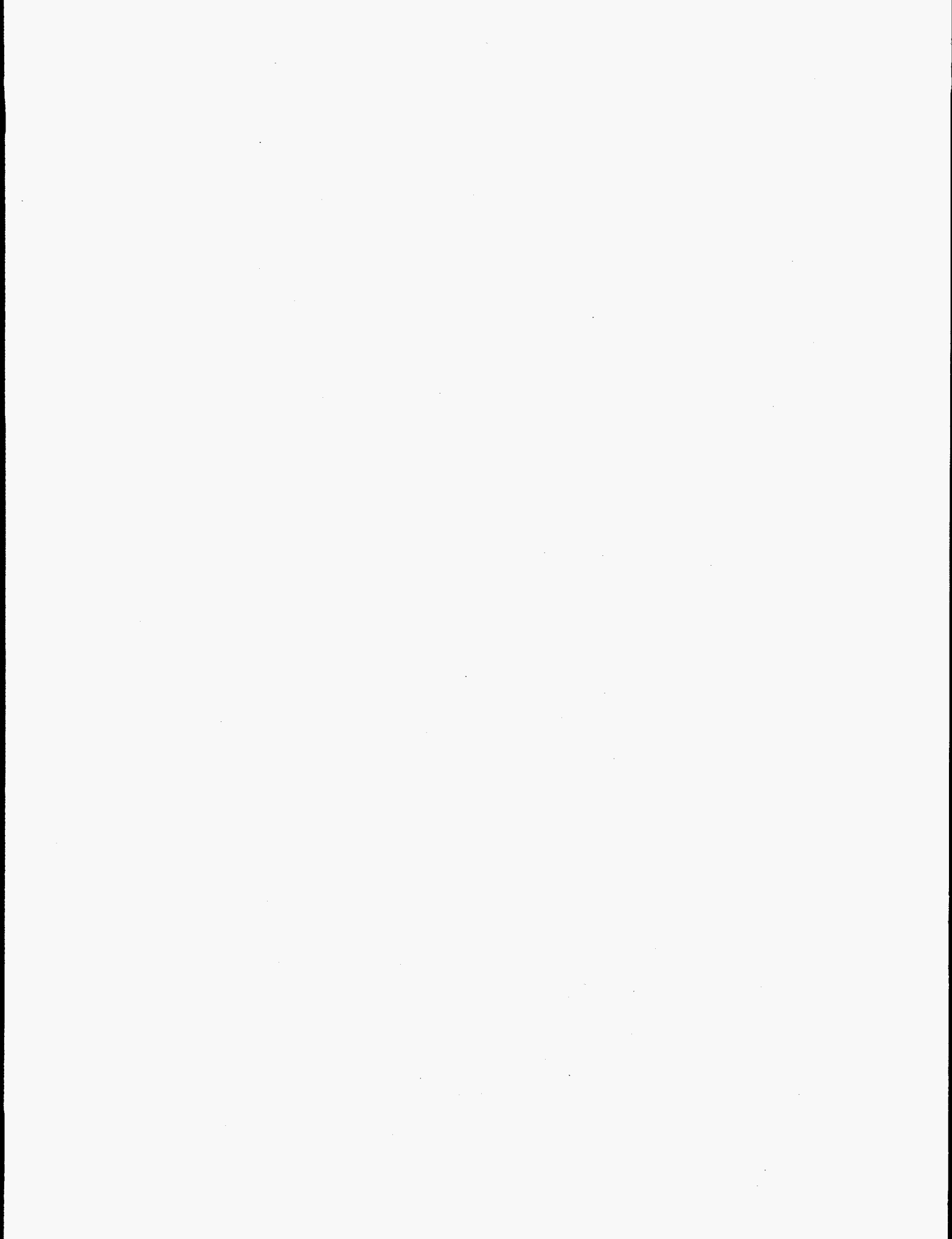
Dr. Percival D. McCormack
National Aeronautics and Space Administration

Technical Assistance Director

CAPT Jay G. McDonald
Department of Energy

Mr. Thaddeus J. Dobry (Alt.)

Department of Energy



APPENDIX E

ORAU TECHNICAL ASSISTANCE STAFF

Mr. Anthony H. Ewing*
Mr. William V. Vitale
Program Director

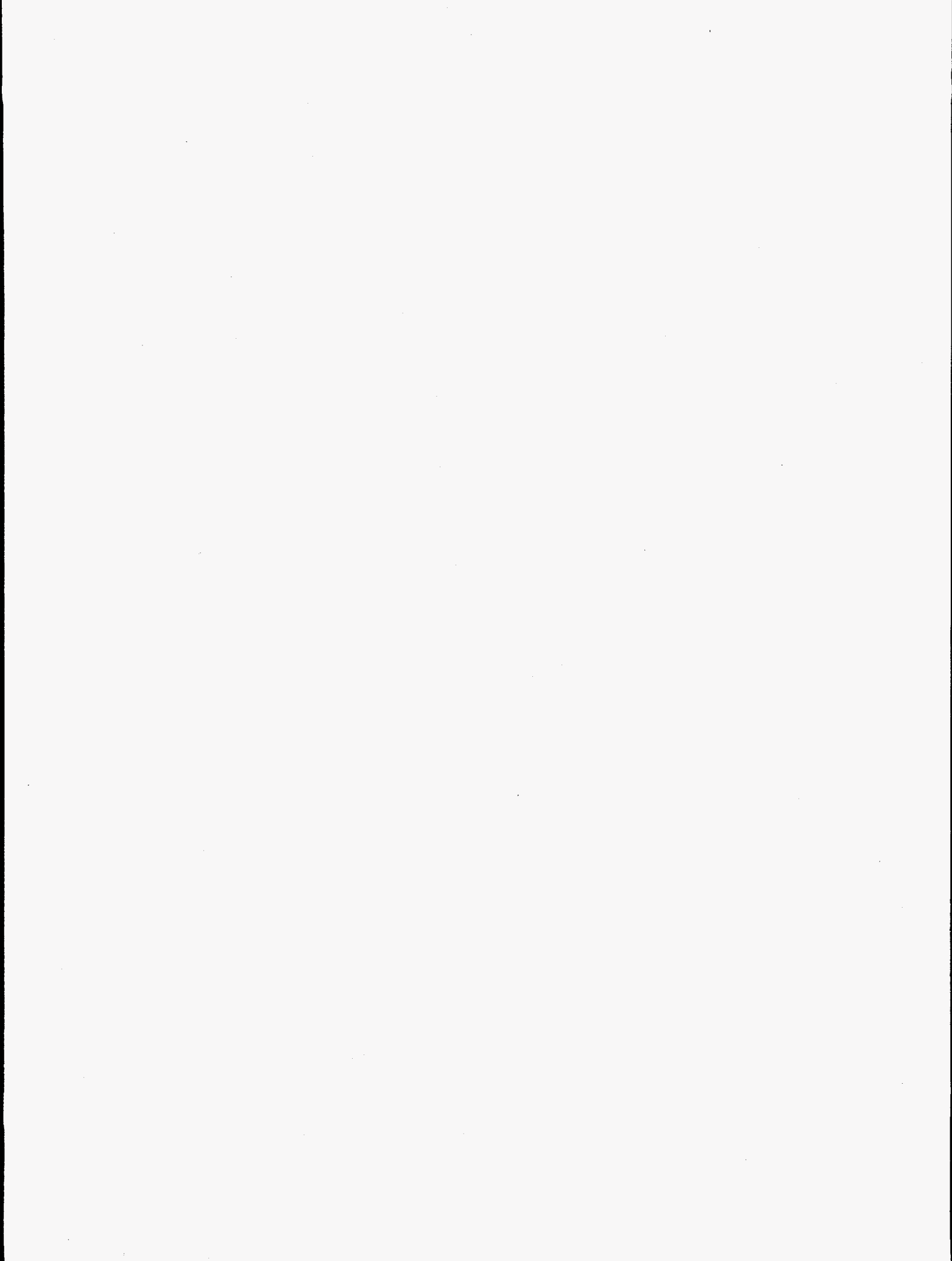
Mr. Edward E. Cour
Administrative Officer

Dr. William A. Mills
Sr. Technical Advisor

Mr. David S. Smith
Technical Analyst

Ms. Diane S. Flack
Technical Advisor

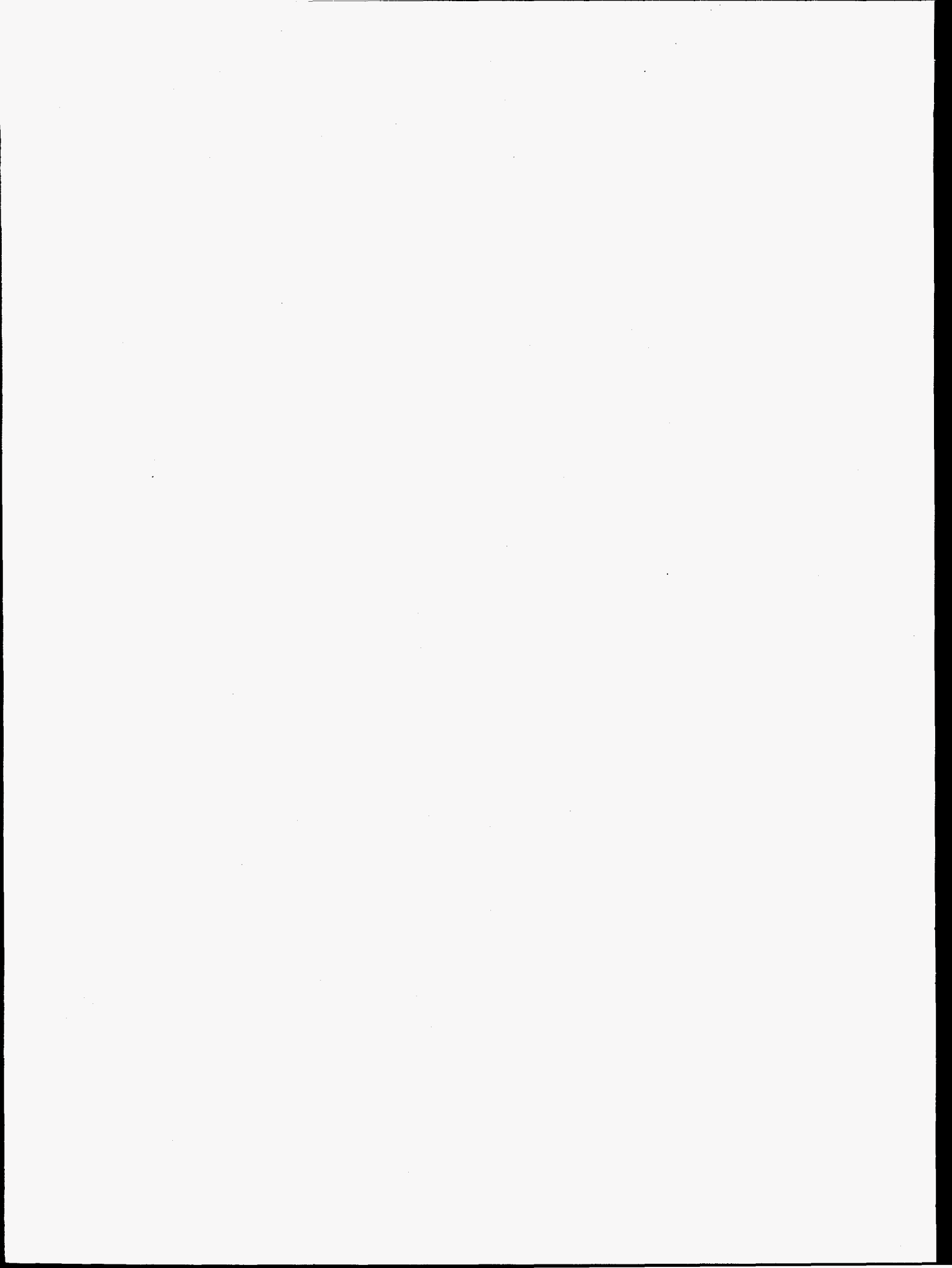
*July 1, 1989 through March 15, 1990.



APPENDIX F

LIST OF COMPLETED REPORTS 1984-90

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



APPENDIX G

POLICY AND SCIENCE SUBPANEL PARTICIPANTS (as of June 30, 1990)

■ Policy Subpanel on Radioepidemiological Tables

Dr. Robert B. Barker, DOD
(Chairman)
MAJ Ken Gilbert (Alt.), DOD
Mr. Robert Brittigan, 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
Mr. Wesley Johnson, USDA
Ms. Jeannine T. Lewis, HHS
Mr. James Malaro, NRC
Dr. Bill M. Morris, NRC
Mr. Stephen Page, EPA
Mr. Joel Segal, HUD
Mr. Marlow J. Stangler, FEMA
Mr. Allan B. Tanner, DOI
Mr. Andrew Wallo, III, DOE
Mr. Dennis Wagner, EPA
Mr. Michael E. Wangler, DOT

■ Ad Hoc Group on Work Statement on EM Radiation

Dr. Robert McGaughy (Chairman), EPA
LCDR H.F. Kerschner, DOD
Dr. John O. de Lorge (Alt.), DOD
Dr. Sheldon Weiner, DOL
Dr. Charlotte Silverman, HHS
Dr. Imre Gyuk, DOE
Mr. John C. Monahan, HHS

■ Science Subpanel on High-LET Radiation

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

■ Task Group on High-LET Radiation

Dr. George W. Casarett, Chairman
Univ. of Rochester Medical Center
Dr. Leslie A. Braby
Battelle Pacific Northwest Lab.
Dr. Johan Broerse
TNO Radiobiological Institute
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

