Annual Report

2016

Year in Review

NCRP

Contents

Charter

The National Council on Radiation Protection and Measurements is a nonprofit corporation chartered by Congress in 1964 to:

1. Collect, analyze, develop and disseminate in the public interest information and recommendations about (a) protection against radiation and (b) radiation measurements, quantities and units, particularly those concerned with radiation protection.
2. Provide a means by which organizations concerned with the scientific and related aspects of radiation protection and of radiation quantities, units and measurements may cooperate for effective utilization of their combined resources, and to stimulate the work of such organizations.
3. Develop basic concepts about radiation quantities, units and measurements, about the application of these concepts, and about radiation protection.
4. Cooperate with the International Commission on Radiological Protection, the International Commission on Radiation Units and Measurements, and other national and international organizations, governmental and private, concerned with radiation quantities, units and measurements and with radiation protection.

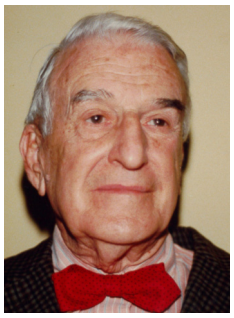
The Council is the successor to the unincorporated association of scientists known as the National Committee on Radiation Protection and Measurements and was formed to carry on the work begun by the Committee in 1929.

Participants in the Council's work are the Council members and members of scientific, advisory and administrative committees. Council members are selected on the basis of their scientific expertise and serve as individuals, not as representatives of any particular organization. The scientific committees, composed of experts having detailed knowledge and competence in the particular area of the committees' interests, draft reports, commentaries and statements. These are then submitted to the full membership of the Council for careful review and approval before being published.

Mission

To support radiation protection by providing independent scientific analysis, information and recommendations that represent the consensus of leading scientists.

Presidents



Lauriston S. Taylor
1929 – 1977

Warren K. Sinclair
1977 – 1991

Charles B. Meinhold
1991 – 2002

Thomas S. Tenforde
2002 – 2012

John D. Boice, Jr.
2012 –

President's Message

The National Council on Radiation Protection and Measurements (NCRP) strives to address national needs in radiation protection. It has been another exciting year with the hard work of multiple committees overflowing with new scientific ideas. A few highlights:

- In July 2016, Dr. Kathryn D. Held was selected to serve as the Council's next Executive Director and Chief Science Officer. Kathy was first elected to the Council in 2006 and served on the NCRP Board of Directors from 2008 to 2014. She was Vice President from 2011 to 2016 and Co-Chair of Program Area Committee 1 (PAC 1) on Basic Criteria, Epidemiology, Radiobiology, and Risk. She remains an Associate Radiation Biologist in the Department of Radiation Oncology, Massachusetts General Hospital and Associate Professor of Radiation Oncology (Radiation Biology) at Harvard Medical School. NCRP is delighted to have Kathy "on board." Already she has been invaluable in keeping NCRP running smoothly since November 2016, when I underwent back surgery.
- Council Committee 1 (CC 1), Radiation Protection Guidance for the United States, is making great progress on providing a new look at radiation protection recommendations. NCRP Report No. 116 (1993) is being updated with financial support from the U.S. Nuclear Regulatory Commission (NRC) (Chair: Kenneth R. Kase; Co-Chair: Donald A. Cool).
- CC 2, Meeting the Needs of the Nation for Radiation Protection, continues and expands upon our Where are the Radiation Professionals? (WARP) initiative, NCRP Statement No. 12 (2015). This incredibly important activity for our future has undergone reorganization and has writing teams hard at work (Chair: Richard E. Toohey; Co-Chairs: Kathryn A. Higley and Wayne D. Newhauser).
- Commentary No. 25, *Potential for Central Nervous System Effects from Radiation Exposure During Space Activities Phase I: Overview* (2016), was published (Co-Chairs: Leslie A. Braby and Richard S. Nowakowski).
- Commentary No. 26, *Guidance on Radiation Dose Limits for the Lens of the Eye* (2016), was published (Co-Chairs: Eleanor A. Blakeley and Lawrence T. Dauer).
- The president wrote 12 "Boice Report" columns on "all things radiation" for the *Health Physics News*, made 25 invited presentations to international, national, scientific and university audiences (including the Distinguished Lecture at the University of Tennessee, College of Engineering), and had 10 publications in the scientific literature. A study on leukemia risk following nuclear weapons testing in the *Journal of Radiological Protection* was selected among the most influential articles of the year and will be available for free access for the rest of the year.
- Funds to support scientific committees (SCs) have been provided by several agencies including:
  - Centers for Disease Control and Protection (CDC) (SC 1-20, SC 2-6, SC 4-5, SC 4-7, SC 4-9, and SC 6-9);
  - City of New York (SC 3-1);

  - Food and Drug Administration (SC 4-5);
  - National Aeronautics and Space Administration (NASA) [SC 1-24 and Million Worker Study (MWS)];
  - U.S. Department of Energy (DOE) (SC 2-7 and MWS);
  - U.S. Department of Homeland Security (DHS) (SC 3-1); and
  - NRC (CC 1, SC 1-23, SC 1-25, and MWS).
- MWS is recognized around the world as the major investigation to fill gaps in understanding the health effects of exposures received gradually over time. Over the years, support has been received from many agencies [U.S. Department of Defense (DOD), DOE, U.S. Environmental Protection Agency (EPA), NASA, the National Cancer Institute (NCI), NRC, and in kind support from the U.S. Department of Veterans Affairs and military services] but now funding has been reduced substantially and eliminated in some cases. Thus there is a serious need to secure adequate funding for completion before this window of opportunity closes.
- A workshop was held at the 2016 mid-year meeting of the Health Physics Society (HPS) in Austin, Texas, on "Radiation Protection for Naturally Occurring Radioactive Materials (NORM) and Technologically Enhanced NORM (TENORM) from Oil and Gas Recovery." A summary was published in *Health Physics News* (March 2016).
- The Proceedings of the 2015 NCRP Annual Meeting on "Changing Regulations and Radiation Guidance: What Does the Future Hold?" were published in the February 2016 issue of *Health Physics*.
- The Proceedings of the 2016 NCRP Annual Meeting on "Meeting the Needs of the Nation for Radiation Protection" were published in the February 2017 issue of *Health Physics*.
- At the HPS 2016 Annual Meeting in Spokane, Washington, in July 2016, I presented a plenary talk on "Space the Final Frontier - Research Relevant to Mars" which will be published in a special issue of *Health Physics* in April 2017. There also was a special session on "Updating NCRP's General Recommendations," Co-Chaired by Kenneth R. Kase and me to present the ongoing work of CC 1.
- Two joint Radiation Research Society (RRS)/NCRP symposia — the Bill Morgan Memorial Symposia — were held at the 2016 RRS Annual Meeting in Hawaii, including presentations about the work of SC 1-25. Proceedings will be published in the *International Journal of Radiation Biology*, with guest editors including Dr. Held and myself.
- A workshop, co-sponsored by NCRP and the Greater New York Chapter of HPS on "Lens of Eye Guidance-Next Steps: A Stakeholder Workshop on Implementation and Research" was held in August 2016 at Memorial Sloan Kettering Cancer Center in New York.
- A refresher course was conducted at the 2016 Annual Meeting of the Radiological Society of North America (RSNA) on "Biodosimetry Issues Following a Major Radiological Incident." This was back by demand; the first refresher course was at the 2015 Annual Meeting of RSNA.
- Several changes of PAC leadership have occurred. Armin Ansari has taken on the reigns of PAC 3 (Nuclear and Radiological Security and Safety); Tammy P. Taylor remains on PAC 3 and Brooke R. Buddemeier remains as Co-Chair. Randall N. Hyer is the new Chair of PAC 7 (Radiation Education, Risk Communication, Outreach, and Policy) succeeding Paul A. Locke and Steven M. Becker, the creators of the PAC. Jonine Bernstein is the new Co-Chair of PAC 1, succeeding Dr. Held who had to step down when she accepted the Executive Director and Chief Science Officer positions.

- SC 1-20 has recently completed a draft report on Biological Effectiveness of Low Energy Photons and Electrons for Evaluating Human Cancer Risk (Chair: Steven L. Simon) that is undergoing Council review.
- SC 1-24 Phase II is expanding on the work of Phase I looking at radiation exposures in space and the potential for effects on the central nervous system. The Committee for Phase II has had several meetings, including one recently at the Johnson Space Center, and is progressing on report preparation (Co-Chairs: Leslie A. Braby and Jacob Raber).
- SC 1-25 on Recent Epidemiologic Studies and Implications for the Linear-Nonthreshold Model (Chair: Roy E. Shore; Co-Chair: Lawrence T. Dauer) was formed in 2015 to provide guidance to CC 1. The final draft commentary from this Committee is expected by the end of the first quarter of 2017.
- SC 2-6 has completed a report on radiation safety aspects of nanotechnology that is currently in final preparations for publication in March 2017 (Chair: Mark D. Hoover; Co-Chair: David S. Myers).
- SC 2-7 has completed a draft report on Radiation Safety Of Sealed Radiation Sources; the report has undergone Council review and is being revised in accord with comments received; with publication expected in late 2017 (Chair: Kathryn H. Pryor).
- SC 3-1 has been progressing at full speed in cooperation with DHS, the New York City (NYC) Department of Health and Mental Hygiene, and other state and federal agencies to address the complex issues of dosimetry for emergency responders in the event of an improvised nuclear device being detonated (Co-Chairs: Stephen V. Musolino and Adela Salame-Alfie). A report will be published in early 2017, and work on the follow-on commentary to provide implementation guidance has begun.
- SC 4-5 recently completed a report on protection in dentistry associated with cone beam computed tomography (CT). The report is being prepared for publication in 2017 (Co-Chairs: Mel L. Kantor and Alan G. Lurie).
- SC 4-7 continues its work on communicating radiation risks and institution review board guidance (Chair: Julie E.K. Timins). The draft report will go out for Council review in early 2017.
- SC 4-8 continues its work on patient dose and CT (Chair: Mannudeep K.S. Kalra).
- SC 5-2 is addressing Radiation Protection for NORM and TENORM from Oil and Gas Recovery (Chair: William E. Kennedy, Jr.).
- SC 6-9 has nearly completed a comprehensive assessment of the complex radiation dosimetry issues for U.S. radiation workers and nuclear test participants (Chair: Andre Bouville; Co-Chair: Richard E. Toohey). The report has undergone Council review and comments are being addressed, with publication expected later in 2017.
- SC 4-9 on Medical Exposure of the U.S. Population has begun preparing a report to evaluate changes in medical x-ray exposure since NCRP Report No. 160 (2009) (Chair: Fred A. Mettler, Jr.; Co-Chair: Mahadevappa Mahesh).
- SC 1-26 will start developing a report expanding NCRP Commentary No. 24 (2015) on Health Effects of Low Doses of Radiation: Perspectives on Integrating Radiation Biology and Epidemiology (Chair: R. Julian Preston).

The President has met and discussed opportunities for partnership with personnel at the American College of Radiology, Harvard University, HPS, NASA, RRS, U.S. Naval Reactors, NRC, and others. NCRP strives to be relevant and attuned to the needs of the nation across many disciplines. Yet, despite the obvious need for radiation guidance in the United States, we continue to be overwhelmed by two tidal waves of societal change: the dwindling number of radiation professionals available to meet the needs of the nation, and the sources of funding for radiation protection activities continue in a downward spiral. Our WARP initiative addresses these tsunami trends of reality, but solutions must include increased governmental recognition and support.

NCRP continues to support the passing of legislation similar to H.R. 35 offered in the previous session (114th) of the US Congress. H.R. 35 was the Bill on Low-Dose Radiation Research which sought to develop a strategy for health research on low-dose radiation to meet national needs. The Bill would have required:

- identifying scientific challenges to understanding low-dose effects;
- assessing the current status of radiation research;
- formulating scientific goals for future radiation research;
- recommending a long-term strategy; and
- prioritizing a research agenda to overcome the challenges and meet the goals.

I applaud our legislative leaders for recognizing a serious gap in the nation's infrastructure necessary to deal with the burgeoning exposure of the population to medical radiation, the potential burden of regulatory actions if overly conservative, as well as the consequences of nuclear terrorism and major nuclear reactor accidents.

SC 1-21 was remarkably prescient and has published a commentary on the *Health Effects of Low Doses of Radiation: Perspectives on Integrating Radiation Biology and Epidemiology* (2015). These goals are similar to those articulated in H.R. 35. Critical research needs for evaluating low-dose radiation health effects are the focus to bridging the gap between molecules and the entire human being. Biologically-based models coupled with high-quality, large-scale epidemiologic data such as those coming from the MWS are one way forward. This public awareness about gaps in radiation knowledge further accentuates the urgency for developing and strengthening major programs in the United States to train, engage and retain radiation protection professionals necessary to meet the needs of our nation.

The issues of radiation protection in the 21st century have been sculptured by recent events, by the increasing use of radiation in medicine, and by the horrific possibility of a nuclear terrorist act. The March 2011 Fukushima nuclear reactor accident and meltdown was a major radiation disaster which brought into vivid focus the need for radiation guidance and improved ways to communicate with the press, members of the public, and, equally important, the medical community and scientists. In 2007 the International Commission on Radiological Protection (ICRP) made recommendations that have generated interest around the world and coincide with U.S. initiatives to update and revise our protection regulations. NCRP is addressing the needs for regulatory change and thoughtful guidance through the work of CC 1 which is updating and expanding on NCRP Report No. 116 entitled *Limitation of Exposure to Ionizing Radiation* (1993).

Our financial situation, in my view, has remained around a B–: okay (we can keep the lights on) but long-term funding possibilities, while getting better, are still uncertain. In addition to grants and contracts, we receive interagency support for research efforts for the MWS, and we are reaching out to government agencies to support the initiatives outlined above as well as to benefactors, donors, industry, professional societies, and universities. We are grateful for our corporate sponsors and many professional contributors but we need more resources to increase our ability to serve the nation at this critical time. We will continue to develop innovative approaches for resource gathering and will work to invigorate our resource committee (Chair: James A. Brink) under the auspices of our finance committee. Please send us ideas for opportunities to support NCRP and your interest in helping.

To secure the long-term stability of NCRP, creating a foundation with endowed funding would go a long way to address basic salary needs, support for interns and training, and expansion of the activities related to the ever increasing needs of the nation for radiation protection. We continue to look for opportunities.

Small endeavors to increase the financial stability of NCRP include the AmazonSmile® initiative where, at no cost to the individual, all purchases made on Amazon will provide a small percentage back to NCRP. Other opportunities suggested were to add NCRP as a small percentage beneficiary on IRAs, 401(k)s, and life insurance policies as already done by some Council members. Council members also make direct charitable contributions to NCRP and donations in memory of deceased Council members (*e.g.*, William M. Beckner and William F. Morgan) are very much appreciated. As an example, I continue to make charitable contributions to NCRP to assist with ongoing programs. The funds can be committed to a specific topic or uncommitted and then applied to defray the costs of the annual meeting and underfunded program areas.

Our 2016 Annual Meeting (published in the February 2017 issue of *Health Physics*) was on "Meeting the Needs of the Nation for Radiation Protection." This meeting was a continuation of our WARP initiative (Statement No. 12) and CC 2 activities. New enhancements at the meeting included for the first time the Joint Armed Forces Honor Guard from the Military District of Washington D.C. and the singing of our National Anthem by Kimberly Gaskins of NRC. The 2016 Annual Meeting featured the 40th Lauriston S. Taylor Lecture by John W. Poston, Jr. who discussed radiation protection and regulatory science; the 13th Annual Warren F. Sinclair address presented by Richard E. Toohey, who reviewed the WARP-related activities of NCRP; and the 2016 Members' Dinner Speaker, Randall N. Hyer, whose talk was entitled "Breaking Bad News in the High-Concern, Low Trust Setting: How to Get Your Story Heard." These invited presentations were all published in the proceedings.

Our 2017 Annual Meeting is on "Assessment of National Efforts in Emergency Preparedness for Nuclear Terrorism: Is There a Need for Realignment to Close Remaining Gaps? (Co-chairs: Armin Ansari and Adela Salame-Alfie). The issue of radiological emergency preparedness is an important topic for our nation. This meeting will take an introspective and critical look at the advances that have taken place in the last 15 y, focusing on key areas of preparedness and response. The meeting will continue enhancements of past years including: the Honor Guard and singing of the National Anthem; videotaping each presentation (a new initiative will be linking the final publications to the videotaped presentations); travel awards to three young scientists made possible by the generosity of RRS; questions and answers published in the proceedings; and assistance from armed forces volunteers. The

meeting highlights will include the 41st Lauriston S. Taylor Lecture by F. Ward Whicker on "Environmental Radiation and Life: A Broad View"; the 14th Annual Warren F. Sinclair address presented by Jack Hermann on "Aren't We Ready Yet? Closing the Planning, Response and Recovery Gaps for Radiological Terrorism"; and the Members' Dinner Speaker Adam Hutter with a talk entitled "Sidekicks to the Heroes: How Science and Technology Supports First Responders."

A column describing NCRP and other radiation professional activities ("The Boice Report") has completed its fifth year of monthly publications in *Health Physics News*. Covered are recent events in radiation protection, measurements, science, and health throughout the world. There have been 53 columns published through December 2016. A compilation publication is being considered of the first 50 columns.

My travel schedule and presentation schedule in 2016 continued to be substantial and included presentations at:

- Harvard T.H. Chan School of Public Health;
- Uniformed Services University of the Health Sciences;
- University of Tennessee, College of Engineering, Knoxville, Tennessee;
- RRS 62th Annual Meeting, Kona, Hawaii;
- NCRP 52th Annual Meeting, Bethesda, Maryland;
- 12th Annual Gilbert W. Beebe Symposium, National Academies, Washington, D.C.;
- 2016 Summer Curriculum in Cancer Prevention, NCI, Rockville, Maryland;
- NRC Regulatory Information Conference (RIC), Rockville, Maryland (attended);
- 57th Annual Meeting of the Baltimore-Washington Chapter of HPS, Rockville, Maryland;
- HPS 61th Annual Meeting, Spokane, Washington;
- HPS 49th Midyear Meeting, Austin, Texas;
- Meetings of the Interagency Steering Committee on Radiation Standards, Washington, D.C.;
- 2016 NASA Investigators' Workshop; "Frontiers in Human Space Exploration Research; Space Radiation Carcinogenesis III and Galactic Cosmic Ray Simulation," Galveston, Texas;
- International Radiation Protection Association (IRPA 2016), Cape Town, South Africa;
- Center for Radiological Research Centennial Celebration Symposium, Columbia University, New York;
- Radiation Protection Week, Oxford, United Kingdom;
- 5th International Expert Symposium in Fukushima; "Chernobyl+30, Fukushima+5: Lessons and Solutions for Fukushima's Thyroid Question," Fukushima, Japan; and
- Symposium organized by the Chinese Society of Radiation Protection in conjunction with ICRP, Shenzhen, China.

During 2016, I received the following recognitions:

- Distinguished Public Health Service Award, HPS, Spokane, Washington;
- Distinguished Lecturer, University of Tennessee, College of Engineering, Knoxville, Tennessee; and
- Sievert Award, IRPA, Cape Town, South Africa.

The 2016 calendar year was productive with the continuing work of standing SCs and initiation of new committees outlined above, and the publication of NCRP reports, commentaries, proceedings, statements, and scientific articles. These include:

- NCRP Commentary No. 25, *Potential for Central Nervous System Effects from Radiation Exposure During Space Activities Phase I: Overview* (2016).
- NCRP Commentary No. 26, *Guidance on Radiation Dose Limits for the Lens of the Eye* (2016).
- The Proceedings of the 51st Annual Meeting in 2015 on "Changing Regulations and Radiation Guidance: What Does the Future Hold?" (Chairs: Donald A. Cool, Ruth E. McBurney, and Kathryn H. Pryor) was published in *Health Physics* in February 2016. The Proceedings included the 39th Lauriston S. Taylor Lecture on Radiation Protection and Measurements by Keith F. Eckerman on "Dosimetry of Internal Emitters: Contributions of Radiation Protection Bodies and Radiological Events" and the 12th Annual Warren K. Sinclair Keynote Address by Kenneth R. Kase on "Influence of NCRP on Radiation Protection in the United States: Guidance and Regulation." The first Thomas S. Tenforde Topical Lecture was by Jacques Lochard on "Ethics and Radiation Protection" [Health Phys. **110**(2), (2016)]. Another innovation was the first publication of the Members' Dinner talk: former NRC Chairman Allison Macfarlane's presentation and publication was on "Radiation and Regulation in a Post-Fukushima World" [Health Phys. **110**(2), 118–122 (2016)]. An informative summary by Richard E. Toohey with accompanying photographs by Casper Sun were published in the May 2015 issue of *Health Physics News*!
- The Proceedings of the 2016 NCRP Annual Meeting, "Meeting the Needs of the Nation for Radiation Protection," (Co-Chairs: Judith L Bader, Kathryn H. Pryor, and Richard E. Toohey) was published in the February 2017 issue of *Health Physics*, including the: 40th Lauriston S. Taylor Lecture by John W. Poston, Jr. on "Radiation Protection and Regulatory Science"; the 13th Annual Warren F. Sinclair address by Richard E. Toohey on "Where are the Radiation Professionals (WARP)?"; and the 2016 Members' Dinner talk by Randall N. Hyer, "Breaking Bad News in the High-Concern, Low Trust Setting: How to Get Your Story Heard." An informative summary by Dr. Toohey with accompanying photographs by Casper Sun were published in the June 2016 issue of *Health Physics News*!
- A Stakeholder Workshop on Implementation and Research: Lens of Eye Guidance-Next Steps was held at Memorial Sloan Kettering, New York in partnership with the Greater New York Chapter of HPS. The presentations are available at: http://ncrponline.org/wp-content/themes/ncrp/PDFs/2016/LensEye_Workshop_presentations.pdf

Active committees are preparing the reports and commentaries highlighted at the beginning of the President's Message. In addition, NCRP has continued to move forward to address the evolving and challenging issues of radiation protection facing our nation. These include:

- To draw younger professions into the protection arena, we continue our partnership with RRS, who provides travel support for young scientists to attend the NCRP annual meeting. Three were able to attend in 2016 and three are planned for 2017.
- We continue to partner with HPS to improve the conduct of our mission to enhance radiation protection in the United States. After being an instrumental part of their 2016 midyear meeting on

TENORM in Austin, Texas, we had a similar presence at the 2017 midyear meeting in Bethesda, Maryland, January 23-23, 2017, with a session on "Radiation Protection and Nuclear Power." An informative summary of the Symposium by Donald A. Cool is in press for the March 2017 issue of the *Health Physics News*. We have begun discussing an appropriate topic for the NCRP sessions in Denver at the 2018 HPS midyear meeting, with waste management being high on the list.

- The CC 1 draft report on Radiation Protection Guidance for the United States was circulated to members of the PACs and ICRP in the spring of 2016, then Committee Co-Chairs Kase and Cool discussed the draft with each PAC during their meetings on April 10, 2016. During 2016, presentations were made by the Co-Chairs, soliciting feedback, to the American Association of Physicists in Medicine (AAPM); Conference of Radiation Control Program Directors; HPS; ICRP; IRPA; Radiation Protection Week, Oxford; RRS; RSNA; and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). The Committee has been reviewing the extensive comments from the PACs, stakeholder meetings, and the ICRP Task Group and incorporating them into a new draft report. At their September 2016 meeting, the Committee reached consensus on several overarching issues and on the disposition and substantial reworking of each section of the draft. Rewriting to consider all comments is underway to create a document that will be useful for the United States: practical, implementable, and easy to understand. It will strive to provide adequate protection against the adverse consequences of radiation without unduly limiting the beneficial uses.
- We partner with agencies (federal, state and local) with substantial interests and programs involving radiation and protection. These include the CDC, DHS, DOD, DOE, EPA, NASA, National Nuclear Security Administration, U.S. Navy, NYC, NRC, and others. We are the Council for the nation and strive to meet the needs of our country in all facets of radiation protection.
- We are improving the PAC structure in having, for the fourth time, full PAC meetings and then a joint session of all PACs just before the annual meeting to present current activities and future plans and visions. This rewarding experience, begun in 2014, has become a mainstay of the annual meeting. An innovation in 2015 was the individual publication of PAC activities and vision by their chairs. Similar summaries are considered for 2017.
- Issues surrounding radiofrequencies could be considered in the future such as cell phone exposures and other uses of nonionizing radiation, including concerns over electromagnetic field exposures. The NCRP Advisory Panel on Nonionizing Radiation was reconstituted in 2015.
- We still need to become more attuned to the modern age of social media with Twitter®, Facebook®, YouTube®, Instagram®, and other approaches to outreach.
- We continue the arrangement negotiated with AAPM in 2015 for a period of 5 y to make PDFs of NCRP publications available to their members. This is providing wider distribution of NCRP recommendations as well as securing funding for a portion of our publication revenue. We hope to gain other partners in the distribution of our publications.
- NCRP continues to participate in meetings or conferences of HPS, ICRP, the NRC RIC, RRS, UNSCEAR, and more. These venues increase NCRP visibility and impact.
- Approaches to improve radiation risk communication, perception and outreach continue to be developed. As the NCRP President, I continue to provide interviews with the *New York Times*, *Scientific American*, and other media on issues ranging from cellular telephones to Fukushima.

- Expanding our efforts in medicine, such as quality management of radiological medical imaging and electronic tracking of patient exposures continues. As listed above, SC 4-5 on protection in dentistry associated with cone beam CT has completed its report, which is in the final stages of preparation for publication. A new initiative, updating the medical component of NCRP Report No. 160 (2009), has begun with the official formation of SC 4-9 on Medical Exposure to the U.S. Population in January 2017.
- I am on the 2024 IRPA North American Bid Task Force which successfully secured the International Conference to be held in Orlando. The topic proposed is on "Harmonization in Radiation Protection Issues." I was honored at the 2016 IRPA Conference in Cape Town, South Africa by receiving the Sievert Award. Lauriston S. Taylor was the only other American to receive this award since its offering 50 y ago.
- I remain on the ICRP Main Commission (first elected in 1997) and am now the alternate U.S. Representative to UNSCEAR (first appointed on the delegation by the State Department in 1993).

NCRP reports, activities, members, programs and more can be found on the website, http://NCRPonline.org. The NCRP program of activities is made possible by the partnership and financial support from many government agencies including CDC, NASA, NCI, NYC, DOD, DOE, DHS, EPA, and NRC, as noted above. In addition, gifts from our corporate sponsors and many collaborating organizations, as well as some individual donors, remain critical to our continued success and are gratefully acknowledged.

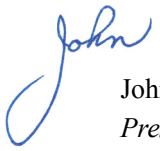
It is with great sadness that I recognize the passing of three NCRP Council members, participants, and wonderful individuals, and also personal friends, who died in the past year:

Robert O. Gorson: Bob was Professor Emeritus, University of Pennsylvania and Thomas Jefferson University; Council Member, 1964–1987; Distinguished Emeritus Member, 1987–2016; Board of Directors, 1968–1974; Budget and Finance Committee, 1968–1976; Nominating Committee, 1981–1984, Chair 1985–1987; Member SC 44, SC 4-4; Liaison SC 46-13; AAPM History Committee with 100+ archival video interviews; informal NCRP historian with priceless recordings of annual meeting discussions and activities.

Bo Lindell: Bo was NCRP Lauriston S. Taylor Lecturer, 1988; ICRP Emeritus Member; ICRP Chairman, 1977–1985; ICRP Vice Chairman, 1969–1977; ICRP Scientific Secretary, 1957–1962; IRPA Executive Council 1966–1973.

Constantine J. Maletskos: Costa was an NCRP Technical Staff Consultant on Report No. 158, U*ncertainties in the Measurement and Dosimetry of External Radiation* (2007); Report No. 155, *Management of Radionuclide Therapy Patients* (2006); Report No. 144, *Radiation Protection for Particle Accelerator Facilities* (2003); Report No. 140, *Exposure Criteria for Medical Diagnostic Ultrasound: II. Criteria Based on All Known Mechanisms* (2002); and Report No. 66, *Mammography* (1980) [the first NCRP report on which I served as a Committee member].

Finally, NCRP remains a dynamic and influential organization only because of the generous contributions of time and knowledge made by Council members, the Senior Vice President, Scientific Vice Presidents, committee members, Board of Directors, consultants, and the NCRP staff! These continue to be exciting times, challenging times, and changing times and opportunities abound. We are limited only by our imaginations (and shrinking budgets!). We balance two issues in management articulated by Admiral Rickover — the need to embrace innovation without losing sight or capitulating to the process (the routine hard work) that got NCRP where we are today and keeps us on an even keel. Our goal remains to be efficient, effective and productive, with a broad view for the future with ideas and visions to address the needs of the nation as we meet together the challenges of radiation protection for the 21st century! Your help, guidance, and financial support are essential for the future of NCRP.



John D. Boice, Jr.
President

Membership

There are 100 Council Members serving six-year terms. There are normally 15 to 19 vacancies each year. Election of Council Members is based on nominations made by committee chairmen, current and Distinguished Emeritus Council members, and the Nominating Committee. New members are nominated and elected based primarily on the scientific contributions they have made to the work of the Council and/or recognized interest and scientific or professional competence in some aspect of radiation protection and measurements. In addition, the Board of Directors recommends that candidates with specific areas of expertise be sought based on the needs of the Council. The Council is comprised of specialists in biophysics, dentistry, dosimetry, environmental transport, epidemiology, genetics, health physics, medical physics, molecular and cellular biology, nuclear energy, nuclear medicine, pathology, physics, public health, public policy, radiation measurements, radiation therapy, radiobiology, radiology, risk analysis and communication, statistics, and waste management. In 2016 there were 21 vacancies; nine new members were elected, and 10 members were re-elected. The nine new members were:

C. Norman Coleman	National Cancer Institute
Scott Davis	Fred Hutchinson Cancer Research Center
Randall N. Hyer	Center for Risk Communication
Gladys A. Klemic	U.S. Department of Homeland Security
Linda A. Kroger	University of California Davis School of Medicine
Mark P. Little	National Cancer Institute
Alan G. Lurie	University of Connecticut School of Dental Medicine
David C. Spelic	Center for Devices and Radiological Health, FDA
Glenn M. Sturchio	Mayo Clinic

2016 Council Membership

Sally A. Amundson	Columbia University Medical Center	2016–2022
Armin Ansari	Centers for Disease Control and Prevention	2015–2021
A. Iulian Apostoaei	Oak Ridge Center for Risk Analysis	2012–2018
Kimberly E. Applegate	Emory University School of Medicine	2013–2019
Edouard I. Azzam	Rutgers, The State University of New Jersey	2012–2018

Judith L. Bader	U.S. Department of Health & Human Services	2014–2020
Stephen Balter	Columbia-Presbyterian Medical Center	2013–2019
Daniel J. Barnett	Johns Hopkins Bloomberg School of Public Health	2015–2021
Steven M. Becker	Old Dominion University	2011–2017
Jonine L. Bernstein	Memorial Sloan-Kettering Cancer Center	2012–2018
Eleanor A. Blakely	Lawrence Berkeley National Laboratory	2012–2018
William F. Blakely	Armed Forces Radiobiology Research Institute	2015–2021
Daniel J. Blumenthal	U.S. Department of Energy	2015–2021
John D. Boice, Jr.	National Council on Radiation Protection and Measurements	2012–2018
Wesley E. Bolch	University of Florida	2011–2017
Michael Boyd	U.S. Environmental Protection Agency	2014–2020
Richard R. Brey	Idaho State University	2013–2019
James A. Brink	Massachusetts General Hospital	2011–2017
Brooke R. Buddemeier	Lawrence Livermore National Laboratory	2015–2021
Jerrold T. Bushberg	University of California, Davis	2014–2020
Polly Y. Chang	SRI International	2011–2017
S.Y. Chen	Illinois Institute of Technology	2011–2017
Mary E. Clark	U.S. Environmental Protection Agency	2014–2020
C. Norman Coleman	National Cancer Institute	2016–2022
Donald A. Cool	Electric Power Research Institute	2013–2019
Michael L. Corradini	University of Wisconsin, Madison	2016–2022
Francis A. Cucinotta	University of Nevada, Las Vegas	2013–2019
Lawrence T. Dauer	Memorial Sloan-Kettering Cancer Center	2012–2018
Scott Davis	Fred Hutchinson Cancer Research Center	2016–2022
Christine A. Donahue	CB&I	2015–2021
Joseph R. Dynlacht	Indiana University School of Medicine	2014–2020
Andrew J. Einstein	Columbia University	2012–2018
Patricia A. Fleming	Saint Mary's College, Notre Dame	2015–2021
Norman C. Fost	University of Wisconsin – Madison	2011–2017
Donald P. Frush	Duke University Medical Center	2016–2022
Ronald E. Goans	MJW Corporation	2013–2019
Eric M. Goldin	Retired	2015–2021
Helen A. Grogan	Cascade Scientific, Inc.	2014–2020
Kathryn D. Held	National Council on Radiation Protection and Measurements & Massachusetts General Hospital	2012–2018
Kathryn A. Higley	Oregon State University	2014–2020
Roger W. Howell	Rutgers, The State University of New Jersey	2015–2021
Randall N. Hyer	Center for Risk Communication	2016–2022
William E. Irwin	Vermont Department of Health	2015–2021

Cynthia G. Jones	U.S. Nuclear Regulatory Commission	2011–2017
Timothy J. Jorgensen	Georgetown University Medical Center	2013–2019
William E. Kennedy, Jr.	Dade Moeller	2016–2022
Katherine A. Kiel	College of the Holy Cross	2015–2021
Gladys A. Klemic	U.S. Department of Homeland Security	2016–2022
David C. Kocher	Oak Ridge Center for Risk Analysis	2011–2017
Linda A. Kroger	University of California Davis School of Medicine	2016–2022
Amy Kronenberg	Lawrence Berkeley National Laboratory	2011–2017
Susan M. Langhorst	Washington University School of Medicine	2011–2017
John J. Lanza	Florida Department of Health	2016–2022
Edwin M. Leidholdt, Jr.	U.S. Department of Veterans Affairs	2012–2018
Jonathan M. Links	Johns Hopkins University Bloomberg School of Public Health	2011–2017
Jill A. Lipoti	Retired	2013–2019
Mark P. Little	National Cancer Institute	2016–2022
Paul A. Locke	Johns Hopkins University	2016–2022
Alan G. Lurie	University of Connecticut School of Dental Medicine	2016–2022
Mahadevappa Mahesh	Johns Hopkins Hospital	2015–2021
Donald M. Mayer	Indian Point Energy Center	2015–2021
Ruth E. McBurney	Conference of Radiation Control Program Directors, Inc.	2013–2019
Charles W. Miller	Consultant	2012–2018
Donald L. Miller	Food and Drug Administration	2012–2018
William H. Miller	University of Missouri, Columbia	2011–2017
Stephen V. Musolino	Brookhaven National Laboratory	2014–2020
Bruce A. Napier	Pacific Northwest National Laboratory	2014–2020
Gregory A. Nelson	Loma Linda University Medical Center / National Aeronautics and Space Administration Human Research Program	2012–2018
Wayne D. Newhauser	Louisiana State University	2013–2019
Harald Paganetti	Massachusetts General Hospital	2012–2018
David J. Pawel	U.S. Environmental Protection Agency	2011–2017
Kathryn H. Pryor	Pacific Northwest National Laboratory	2016–2022
Sara Rockwell	Retired	2011–2017
Adela Salame-Alfie	Centers for Disease Control and Prevention	2015–2021
Ehsan Samei	Duke University Medical Center	2013–2019
Debra M. Scroggs	DMcS Consulting	2012–2018
J. Anthony Seibert	University of California Davis Medical Center	2014–2020
George Sgouros	Johns Hopkins University School of Medicine	2013–2019
Steven L. Simon	National Cancer Institute	2016–2022
Christopher G. Soares	National Institute of Standards and Technology	2011–2017

David C. Spelic	Center for Devices and Radiological Health, FDA	2016–2022
Michael D. Story	University of Texas, Southwestern Medical Center at Dallas	2014–2020
Daniel O. Stram	University of Southern California	2013–2019
Glenn M. Sturchio	Mayo Clinic	2016–2022
Steven G. Sutlief	University of California, San Diego	2012–2018
Tammy P. Taylor	Pacific Northwest National Laboratory	2016–2022
Julie K. Timins	Diagnostic Radiology	2016–2022
Richard E. Toohey	M.H. Chew	2012–2018
Michael M. Weil	Colorado State University	2011–2017
Chris G. Whipple	Ramboll Environ	2013–2019
Robert C. Whitcomb, Jr.	Centers for Disease Control and Prevention	2014–2020
Jacqueline P. Williams	University of Rochester Medical College	2012–2018
Gayle E. Woloschak	Northwestern University	2015–2021
Shiao Y. Woo	University of Louisville	2011–2017
X. George Xu	Renesselaer Polytechnic Institute	2014–2020
R. Craig Yoder	Retired	2014–2020
Cary Zeitlin	Leidos	2014–2020
Gary H. Zeman	Illinois Institute of Technology	2011–2017

Board of Directors

Jonine L. Bernstein	Lawrence T. Dauer	Bruce A. Napier
John D. Boice, Jr.	Donald P. Frush	Kathryn H. Pryor
James A. Brink	William E. Kennedy, Jr.	Tammy P. Taylor
Jerrold T. Bushberg	John J. Lanza*	Gayle E. Woloschak
	Ruth E. McBurney	

*Newly elected to the Board of Directors on April 12, 2016.

Officers

President	John D. Boice, Jr.
Senior Vice President	Jerrold T. Bushberg
Secretary and Treasurer	David A. Smith (January – July 2016)
	Kathryn D. Held (July 2016 –)

Distinguished Emeritus Members

Charles B. Meinhold, *President Emeritus*
Thomas S. Tenforde, *President Emeritus*
S. James Adelstein, *Honorary Vice President*
Kenneth R. Kase, *Honorary Vice President*
W. Roger Ney, *Executive Director Emeritus*
David A. Schauer, *Executive Director Emeritus*

Seymour Abrahamson
John F. Ahearne
Lynn R. Anspaugh
Benjamin R. Archer
John A. Auxier
Harold L. Beck
Joel S. Bedford*
Bruce B. Boecker
Thomas B. Borak
Andre Bouville
Leslie A. Braby
Robert L. Brent
Antone L. Brooks
Randall S. Caswell
J. Donald Cossairt
Allen G. Croff*
Paul M. DeLuca
Sarah S. Donaldson
William P. Dornsife
Keith F. Eckerman
Thomas S. Ely
Stephen A. Feig
John R. Frazier
R.J. Michael Fry
Thomas F. Gesell
Ethel S. Gilbert
Joel E. Gray
Robert O. Gorson†
Raymond A. Guilmette
Eric J. Hall
Naomi H. Harley
William R. Hendee
F. Owen Hoffman
Bernd Kahn
Ann R. Kennedy
Ritsuko Komaki
Charles E. Land
Martha S. Linet*
John B. Little
Roger O. McClellan
Barbara J. McNeil
Fred A. Mettler, Jr.
Kenneth L. Miller
A. Alan Moghissi
David S. Myers
Carl J. Paperiello
John W. Poston, Sr.
Andrew K. Poznanski
R. Julian Preston
Jerome S. Puskin
Genevieve S. Roessler
Marvin Rosenstein
Lawrence N. Rothenberg
Henry D. Royal
Michael T. Ryan
William J. Schull
Stephen M. Seltzer*
Roy E. Shore
Paul Slovic
Daniel J. Strom
John E. Till
Lawrence W. Townsend
Robert L. Ullrich
Richard J. Vetter
F. Ward Whicker
Susan D. Wiltshire
Marvin C. Ziskin

*Elected to Distinguished Emeritus Membership April 12, 2016.
†Deceased during 2016.

Consociate Members

Full members of the Council become Consociate Members at the end of their terms provided they are not re-elected to another term on the Council or are not appointed to Distinguished Emeritus membership.

Peter R. Almond
E. Stephen Amis, Jr.
Larry E. Anderson
Mary M. Austin-Seymour
John W. Baum
Merrill A. Bender
Mythreyi Bhargavan-Chatfield
B. Gordon Blaylock
Frederick J. Bonte
Harold S. Boyne
John W. Brand
David J. Brenner
A. Bertrand Brill
Thomas F. Budinger
John F. Cardella
Stephanie K. Carlson
Paul L. Carson
Donald K. Chadwick
Charles E. Chambers
Lawrence L. Chi*
Chung-Kwang Chou
Kelly L. Classic
Stephen F. Cleary
James E. Cleaver
Fred T. Cross
Stanley B. Curtis
John F. Dicello
Richard L. Doan
Carl H. Durney
David A. Eastmond
Marc Edwards
Charles M. Eisenhauer
Joe A. Elder
Edward R. Epp
Alan J. Fischman
H. Keith Florig
Kenneth R. Foster
Everett G. Fuller
Barry B. Goldberg
Robert L. Goldberg
Marvin Goldman
John D. Graham
Douglas Grahn
Andrew J. Grosovsky
Milton G. Guiberteau*
Ellis M. Hall
Roger W. Harms
Robert J. Hasterlik
Martin Hauer-Jensen*
John M. Heslep
John W. Hirshfeld, Jr.
David G. Hoel
George B. Hutchison
A. Everette James, Jr.
Hank C. Jenkins-Smith*
John R. Johnson
James G. Kereiakes
H. William Koch
Harold L. Kundel
Richard W. Leggett
George R. Leopold
Howard L. Liber
James C. Lin
Thomas A. Lincoln
David I. Livermore
Richard A. Luben
Jay H. Lubin
Arthur C. Lucas
Harry R. Maxon
C. Douglas Maynard
Claire M. Mays
Cynthia H. McCollough
Mortimer L. Mendelsohn
Jack Miller
William A. Mills
John E. Moulder
Andrea K. Ng
Peter C. Nowell
Eugene F. Oakberg
Gilbert S. Omenn
Frank L. Parker
Terry C. Pellmar
Lester J. Peters
Ronald C. Petersen
Abram Recht
Allan C.B. Richardson
Robert Robbins
Lester Rogers
Robert E. Rowland
Jonathan M. Samet
Keith J. Schiager
Robert A. Schlenker
Beth A. Schueler
Thomas M. Seed
Ferdinand J. Shore
Edward A. Sickles
Kenneth W. Skrable
David H. Sliney
Michael G. Stabin*
Louise C. Strong
Herman D. Suit
Richard A. Tell
Joop W. Thiessen
Ralph H. Thomas
Elizabeth L. Travis
Lois B. Travis
Fong Y. Tsai
John C. Villforth
Louis K. Wagner*
Daniel E. Wartenberg
Stuart C. White
J. Frank Wilson
Andrew J. Wyrobek
Marco A. Zaider
Pat B. Zanzonico

*Consociate Membership effective April 12, 2016.

Administrative Committees

Budget & Finance Committee (appointed by the Board of Directors, April 12, 2016)

William E. Kennedy, Jr., *Chairman*

Jerrold T. Bushberg
John J. Lanza
Ruth E. McBurney
R. Craig Yoder

Nominating Committee (appointed by the Board of Directors, April 12, 2016)

Donald L. Miller, *Chairman*

Kathryn D. Held*
Kathryn H. Pryor
Adela Salame-Alfie
John E. Till
Michael M. Weil§

*Resigned July 1, 2016
§Appointed October 4, 2016

Program Committee for 2017 Annual Meeting

(appointed by the Board of Directors, April 12, 2016)

Armin Ansari & Adela Salame-Alfie, *Co-Chairs*

Sally A. Amundson
James S. Blumenstock
Daniel J. Blumenthal
Brooke R. Buddemeier
Cullen Case, Jr.
C. Norman Coleman
John Koerner
Tammy P. Taylor

Scientific and Administrative Staff

David A. Smith (January – July 2016)	Executive Director
Kathryn D. Held (July 2016 –)	
Laura J. Atwell	Office Manager
Sarah S. Cohen	Technical Staff Consultant
Joel E. Gray	Technical Staff Consultant
Michael P. Grissom	Technical Staff Consultant
Cindy L. O'Brien	Managing Editor
Beverly A. Ottman	Receptionist
R. Julian Preston	Advisor to the President
Marvin Rosenstein	Technical Staff Consultant
Roy E. Shore	Advisor to the President
Richard E. Toohey	Advisor to the President
Lawrence W. Townsend	Technical Staff Consultant
Richard J. Vetter	Technical Staff Consultant
Myrna A. Young	Financial Records Manager

Council Committees, Program Area Committees, and Advisory Panel

The program area and advisory committees advise the NCRP President and Board of Directors on issues specific to their expertise. They have responsibility for evaluating the need for new NCRP activities related to the philosophy and the basic principles and requirements in their subject areas.

The work of the Council is supported by two Council committees, seven program area committees, and an advisory panel. They are:

Council Committee

Radiation Protection Guidance for the United States

Meeting the Needs of the Nation for Radiation Protection

Program Area Committees

Basic Criteria, Epidemiology, Radiobiology, and Risk	Gayle E. Woloschak Kathryn D. Held (June 2011 – July 2016) Jonine Bernstein (July 2016 –)
Operational Radiation Safety	Kathryn H. Pryor
Nuclear and Radiological Security and Safety	Tammy P. Taylor Brooke R. Buddemeier
Radiation Protection in Medicine	James A. Brink Donald L. Miller
Environmental Radiation and Radioactive Waste Issues	S.Y. Chen Bruce A. Napier
Radiation Measurements and Dosimetry	Steven L. Simon
Radiation Education, Risk Communication, Outreach, and Policy	Randall N. Hyer

Advisory Panel

Nonionizing Radiation

Vice Presidents

Each scientific program area committee is chaired by a Vice President. The Vice Presidents:

- Chair their program area committee
- Provide recommendations for new work in their area
- Represent NCRP to federal agencies and other potential supporters

- Represent NCRP at scientific meetings
- Advise on membership of their program area committee
- Assist NCRP President and chairmen of new scientific committees with selection of potential committee or advisory members
- Assist in management of scientific committee efforts
- Provide the chairman of the nominating committee with potential candidates for Council membership
- Review all draft publications within their program area committee prior to Council review

NCRP

Radiation Protection Guidance for the United States

Chair, Kenneth R. Kase

Key Functions of Council Committee (CC) 1

- Update and expand NCRP Report No. 116 (1993), *Limitation of Exposure to Ionizing Radiation*, with regard to radiation protection as it pertains to the United States.
- Incorporate substantial advances in radiation effects knowledge as well as radiation protection understanding and culture.

Members of CC 1

Status: Revising after PAC review

Kenneth R. Kase, *Chair*
John D. Boice, Jr., *Co-Chair*
Donald A. Cool, *Co-Chair*
Armin Ansari
Jerrold T. Bushberg
Lawrence T. Dauer
Darrell R. Fisher
Patricia A. Fleming
Kathryn A. Higley
Randall N. Hyer
William E. Irwin
Fred A. Mettler, Jr.
Donald L. Miller
R. Julian Preston
Gayle E. Woloschak
John E. Till, *Liaison PAC 7*
S. James Adelstein, *Consultant*
Ralph Andersen, *Consultant*
Michael Boyd, *Consultant*
Marvin Rosenstein, *Technical Staff Consultant*

NCRP

Meeting the Needs of the Nation for Radiation Protection

Chair, Richard E. Toohey

Key Functions of Council Committee (CC) 2

- Monitor graduation and employment statistics for radiation professionals, including but not limited to health physicists, radiobiologists, radioecologists, radiologists, radiation oncologists, nuclear medicine physicians, radiochemists, radiation protection engineers, and allied disciplines.
- Continually assess, revise and renew the comprehensive plan initiated with Where Are the Radiation Professionals? (WARP).
- Promote a government led initiative to develop and strengthen human capital in radiation science and radiation protection.

Members of CC 2

Richard E. Toohey, *Chair*
Kathryn A. Higley, *Co-Chair*
Wayne D. Newhauser, *Co-Chair*
Adela Alfie-Salame
Judith L. Bader
Daniel J. Blumenthal
Richard R. Brey
Donald P. Frush
Pamela Henderson
Jerry W. Hiatt
William E. Kennedy, Jr.
Chad A. Mitchell
Michael A. Noska
Michael Weber
Robert C. Whitcomb, Jr.
Jacqueline P. Williams
Gayle E. Woloschak
Patricia R. Worthington
John D. Boice, Jr., *NCRP Contact*

NCRP

Basic Criteria, Epidemiology, Radiobiology, and Risk

Vice President, Gayle E.Woloschak

Key Functions of Program Area Committee (PAC) 1

- Evaluate and approve all scientific committee draft recommendations on exposure limits.
- Evaluate new epidemiological and radiobiological data and determine their potential effect on human risk coefficients for radiation protection.

Members of PAC 1

Gayle E.Woloschak, *Vice President*
Jonine Bernstein, *Co-Chair*
Sally A. Amundson
Edouard I. Azzam
Joel S. Bedford
Ann R. Kennedy
Amy Kronenberg
Evagelia C. Laiakis
Mark P. Little
Gregory A. Nelson
George Sgouros
Roy E. Shore
Michael D. Story
Daniel O. Stram
Michael M. Weil
Jacqueline P. Williams
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 1

SC 1-20 Biological Effectiveness of Photons as a Function of Energy
Status: Undergoing Council review
Steven L. Simon, *Chair*
Leslie A. Braby
Polly Y. Chang
Dudley Goodhead
Stephen C. Hora
David C. Kocher
Kiyohiko Mabuchi

Jerome S. Puskin
David Richardson
James D. Tucker
Eliseo Vano
Marvin Rosenstein, *Technical Staff Consultant*

SC 1-24 Phase 2: Radiation Exposures in Space and the Potential for Central Nervous System Effects

Status: Early drafting
Leslie A. Braby, *Co-Chair*
Jacob Raber, *Co-Chair*
Polly Chang
David F. Dinges
Dudley T. Goodhead
David Herr
John Hopewell
Janice Huff
Kevin Krull
Thomas J. MacVittie
M. Kerry O'Banion
Michael Qin
James Root
Susanna Rosi
Peter Winsauer
Gregory A. Nelson, *NASA Observer*
Lawrence W. Townsend, *Technical Staff Consultant*

SC 1-25 Recent Epidemiologic Studies and Implications for the Linear-Nonthreshold Model

Status: Preparing for PAC review
Roy E. Shore, *Chair*
Lawrence T. Dauer, *Co-Chair*
Scott Davis
Randall N. Hyer
Fred A. Mettler, Jr.
R. Julian Preston
John E. Till
Richard Wakeford
Linda Walsh
Richard J. Vetter, *Technical Staff Consultant*

Authorized but Unfunded Activities

- lung cancer risks from inhaled radionuclides

Completed in 2016

NCRP Commentary No. 26, *Guidance on Radiation Dose Limits for the Lens of the Eye*, was issued in December 2016. The Commentary was drafted by Scientific Committee 1-23 under the chairmanship of Eleanor A. Blakely and Lawrence T. Dauer. Membership included: Elizabeth A. Ainsbury, Joseph R. Dynlacht, David G. Hoel, Barbara E.K. Klein, Donald M. Mayer, Christina R. Prescott, Raymond H. Thornton, Eliseo Vano, and Gayle E. Woloschak assisted by consultants Cynthia M. Flannery, Lee E. Goldstein, Nobuyuki Hamada, and Phung K. Tran. The NCRP Technical Staff Consultant was Michael P. Grissom.

NCRP

Operational Radiation Safety

Vice President, Kathryn H. Pryor

Key Functions of Program Area Committee (PAC) 2

- Serve as a national resource for information on operational radiation safety.
- Formulate guidance regarding the application of operational radiation safety principles.

Members of PAC 2

Kathryn H. Pryor, *Vice President*
Edgar D. Bailey
Christine A. Donahue
John R. Frazier
Eric M. Goldin
Michael Littleton
David S. Myers
John W. Poston, Sr.
Kathleen L. Shingleton
Glenn M. Sturchio
Joshua Walkowicz
James S. Willison
James G. Yusko
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 2

SC 2-6 Radiation Safety Aspects of Nanotechnology

Status: Preparing for printer's manuscript
Mark D. Hoover, *Chair*
David S. Myers, *Vice Chair*
Leigh J. Cash
Raymond A. Guilmette
Wolfgang G. Kreyling
Gunter Oberdoerster
Rachel Smith
Michael P. Grissom, *Technical Staff Consultant*

SC 2-7 Radiation Safety of Sealed Radioactive Sources

Status: Revising after Council review
Kathryn H. Pryor, *Chair*
Edgar D. Bailey
Christine A. Donahue
John R. Frazier
Eric M. Goldin
Michael Littleton
David S. Myers
John W. Poston, Sr.
Kathleen L. Shingleton
Glen M. Sturchio
Joshua Walkowicz
James S. Willison
James G. Yusko
James L. Thompson, *Consultant*

Authorized but Unfunded Activities

- air monitoring
- operational radiation safety in medical fusion imaging procedures
- design of facilities and installed equipment for handling unsealed radioactive materials
- radiation protection guidelines for industrial accelerators and irradiators

NCRP

Nuclear and Radiological Security and Safety

Vice President, Tammy P. Taylor

Key Functions of Program Area Committee (PAC) 3

- Identify important steps to be taken in the interdiction of, preparedness for, and effective responses to possible acts of nuclear or radiological terrorism.
- Define performance requirements, instrumentation, and testing criteria for security surveillance systems.
- Develop operational strategies and optimization procedures for early, intermediate and late-phase responses to a nuclear or radiological terrorism incident.
- Recommend effective methods for protecting against, mitigating, and treating traumatic injuries and long-term health and psychological effects of radiation exposure and other immediate stress effects such as thermal burns, shock, and contaminated shrapnel wounds resulting from nuclear or radiological explosions or possible acts of nuclear or radiological terrorism.
- Analyze methods for optimizing the cleanup, site restoration, and disposition of contaminated materials resulting from a nuclear or radiological terrorism incident.

Members of PAC 3

Tammy P. Taylor, *Vice President*
Brooke R. Buddemeier, *Co-Chair*
Judith L. Bader
Daniel J. Blumenthal
Lawrence L. Chi
C. Norman Coleman
Nicholas Dainiak
Sara DeCair
John Donnelly
Joseph R. Dynlacht
William E. Irwin
Stephen V. Musolino
Adela Salame-Alfie
Jim Rogers, *Consultant*
Benjamin Stevenson, *Consultant*
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 3

SC 3-1 Guidance for Emergency Responder Dosimetry

Status: Revising after Council review
Stephen V. Musolino, *Co-Chair*
Adela Salame-Alfie, *Co-Chair*
Judith L. Bader
Daniel Blumenthal
Brooke R. Buddemeier
Helen A. Grogan
William E. Irwin
Gladys Klemic
Gregory Komp
Ruth E. McBurney
Jeanine Prudhomme
Richard Schlueck
Tammy P. Taylor
Jessica Wieder
Lawrence T. Dauer, *Consultant*
James Smith, *Technical Staff Consultant*

NCRP

Radiation Protection in Medicine

Vice President, James A. Brink

Key Functions of Program Area Committee (PAC) 4

- Identify areas with which NCRP should be concerned in radiation protection of patients in medical, dental and chiropractic practice.
- Examine and evaluate techniques and procedures to eliminate unnecessary radiation exposure to the patient.
- Examine and evaluate training of medical personnel in radiation protection.

Members of PAC 4

James A. Brink, *Vice President*
Donald L. Miller, *Co-Chair*
Kimberly E. Applegate
Stephen Balter
Jerrold T. Bushberg
Charles E. Chambers
Lawrence T. Dauer
Andrew J. Einstein
Donald P. Frush
Ronald E. Goans
Joel E. Gray
Mannudeep K.S. Kalra
Linda A. Kroger
Edwin M. Leidholdt
Alan G. Lurie
Mahadevappa Mahesh
Fred A. Mettler, Jr.
Wayne D. Newhauser
Ehsan Samei
J. Anthony Seibert
David C. Spelic
Steven G. Sutlief
Julie E.K. Timins
Louis K. Wagner
Stuart C.White
Shiao Y. Woo
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 4

SC 4-5 Radiation Protection in Dentistry Supplement: Cone Beam Computed Tomography, Digital Imaging and Handheld Dental Imaging
Status: Revising after Council review
Mel L. Kantor, *Co-Chair*
Alan G. Lurie, *Co-Chair*
Mansur Ahmad
Veeratrishual Allareddy
John B. Ludlow
Edwin T. Parks
Eleonore D. Paunovich
Robert J. Pizzutiello
Robert A. Sauer
David C. Spelic
Edwin M. Leidholdt, *Consultant*
W. Doss McDavid, *Consultant*
Donald L. Miller, *Consultant*
Joel E. Gray, *Technical Staff Consultant*

SC 4-7 Evaluating and Communicating Radiation Risks for Studies Involving Human Subjects: Guidance for Researchers and Reviewing Bodies
Status: Preparing for Council review
Julie E.K. Timins, *Chair*
Jerrold T. Bushberg
Patricia A. Fleming
Linda A. Kroger
Edwin M. Leidholdt, Jr.
Donald L. Miller
Robert E. Reiman
J. Anthony Seibert
Steven G. Sutlief
Michael P. Grissom, *Technical Staff Consultant*

SC 4-8 Improving Patient Dose Utilization in Computed Tomography
Status: Preparing for PAC review
Mannudeep K.S. Kalra, *Chair*
Donald P. Frush
Edwin M. Leidholdt, Jr.
Mahadevappa Mahesh
Ehsan Samei
John Boone, *Consultant*
Andrew Einstein, *Consultant*
Michael McNitt-Gray, *Consultant*

Authorized but Unfunded Activities

- medical evaluation of workers
- revision of NCRP Report No. 102, *Medical X-Rays, Electron Beam and Gamma-Ray Protection for Energies Up to 50 MeV*

NCRP

Environmental Radiation and Radioactive Waste Issues

Vice President, S.Y. Chen

Key Functions of Program Area Committee (PAC) 5

- Serve as a national resource for environmental radiation and radioactive waste information and data.
- Prepare scientific reports, commentaries and statements that can be used as fundamental scientific references dealing with radionuclides in the environment.
- Help formulate NCRP recommendations on disposal of radioactive and mixed wastes;
- Encourage scientific and technical discourse on the disposal of radioactive and mixed wastes including environmental and human risk from disposal.
- Encourage scientific and technical discourse on the cost-benefit of activities generating radioactive and mixed wastes.

Members of PAC 5

S.Y. Chen, *Vice President*
Bruce A. Napier, *Co-Chair*
Allen G. Croff
Jonathan D. Edwards
R. William Field
Kathryn A. Higley
E. Vincent Holahan
William E. Kennedy, Jr.
Katherine A. Kiel
Jill A. Lipoti
Ruth E. McBurney
Michael A. Noska
Brian A. Powell
Andrew Wallo, III
Chris G. Whipple
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 5

SC 5-2 Radiation Protection for Naturally Occurring Radioactive Materials (NORM) and Technologically Enhanced NORM (TENORM) from Oil and Gas Recovery

Status: Early drafting stage

William E. Kennedy, Jr., *Chair*
David J. Allard
Martin Barrie
Philip Egidi
Gary Forsee
Ray Johnson
Andrew J. Lombardo
Ruth E. McBurney
John R. Frazier, *Technical Staff Consultant*

Authorized but Unfunded Activities

- assessment of measurement methodologies for environmental indicators of past releases (joint with PAC 6)
- case studies and lessons learned from remediation of sites and facilities with radioactive contamination
- clearance as a radiation protection strategy for radioactive material management
- development of a risk assessment and risk management parameter handbook
- radiation protection criteria for plants and animals
- risk-based corrective actions in remediation of contaminated ecosystems
- usage factors for environmental dose calculations

NCRP

Radiation Measurements and Dosimetry

Vice President, Steven L. Simon

Key Functions of Program Area Committee (PAC) 6

- Evaluate the field of radiation measurements and dosimetry.
- Serve as a source of information to scientific committees preparing reports that include radiation measurements and dosimetry.
- Maintain liaison with other organizations and professional societies that have similar interests.

Members of PAC 6

Steven L. Simon, *Vice President*
Luiz Bertelli
William F. Blakely
Wesley E. Bolch
Leslie A. Braby
John F. Dicello
Raymond A. Guilmette
Richard T. Kouzes
Jeffrey J. Whicker
Gary H. Zeman
John D. Boice, Jr., *NCRP Contact*

Active Scientific Committees Under PAC 6

SC 6-9 U.S. Radiation Workers and Nuclear Weapons Test Participants Radiation Dose Assessment
Status: Revising after Council review
Andre Bouville, *Chair*
Richard E. Toohey, *Co-Chair*
Harold L. Beck
Lawrence T. Dauer
Keith F. Eckerman
Derek Hagemeyer
Donald L. Miller
Bruce A. Napier

Kathryn H. Pryor
David A. Schauer
Daniel O. Stram
James L. Thompson
John E. Till
R. Craig Yoder
Cary Zeitlin
Stephen Balter, *Consultant*
Terry Brock, *Consultant*
Richard W. Leggett, *Consultant*
Marvin Rosenstein, *Technical Staff Consultant*

Authorized but Unfunded Activities

- aerosol measurements
- biological dosimetry
- requirements and methods for recording information for accurate dose reconstruction in nuclear or radiological incidents
- update of Report No. 58, *A Handbook of Radioactivity Measurements*
- wound model dose coefficients

NCRP

Radiation Education, Risk Communication, Outreach, and Policy

Vice President, Randall N. Hyer

Key Functions of Program Area Committee (PAC) 7

- Identify the policy implications of NCRP publications, meetings and other events, and seek to communicate those implications in a credible and comprehensible manner to policy makers and the public;
- Suggest members or serve as members of new NCRP scientific committees whose topics relate to education, risk communication, policy, and outreach;
- Provide advice, wording, and strategic outreach options to policy makers and the public for NCRP reports;
- Ensure that NCRP communications and outreach emphasize NCRP's paramount role in providing scientific information and develop communications and outreach strategies so that recommendations are of maximum assistance to policy makers; and
- Bolster educational efforts aimed at recruiting, training and retaining radiation health professionals.

Members of PAC 7

Randall N. Hyer, *Vice President*
John F. Ahearne
Judith L. Bader
Steven M. Becker
Jerrold T. Bushberg
Francis X. Cameron
Hank C. Jenkins-Smith
Jill A. Lipoti
Paul A. Locke
Charles W. Miller
Dennis O'Connor
Debra M. Scroggs
John E. Till
Julie E.K. Timins
John D. Boice, Jr., *NCRP Contact*

Nonionizing Radiation

Key Functions of Nonionizing Radiation Panel

- Analyze mechanisms of interaction of nonionizing radiation with biological systems, including humans
- Identify biological responses and potential human health effects
- Evaluate theoretical and applied aspects of dosimetry and exposure assessment of humans to nonionizing radiation
- Provide recommendations on acceptable exposure levels for nonionizing radiation in occupational, medical and public environments
- Analyze procedures for mitigating exposure in public and occupational settings

Members of Advisory Panel

Jerrold T. Bushberg, *Chairman*
Chung-Kwang Chou
Joseph A. Elder
Kenneth R. Foster
David A. Savitz
Richard A. Tell
Marvin C. Ziskin
John D. Boice, Jr., *NCRP Contact*

Collaborating Organizations

Organizations or groups of organizations that are national in interest and are concerned with scientific problems involving radiation quantities, units, measurements and effects, or radiation protection may be granted collaborating status by NCRP. Collaborating Organizations provide a means by which NCRP can gain input into its activities from a wider segment of society. At the same time, the relationships with the Collaborating Organizations facilitate wider dissemination of information about the Council's activities, interests and concerns. Collaborating Organizations have the opportunity to comment on draft documents at the time that drafts are submitted to the members of the Council. This is intended to capitalize on the fact that Collaborating Organizations are in an excellent position to both contribute to the identification of what needs to be treated in NCRP documents and to identify problems that might result from proposed recommendations. The Collaborating Organizations for the year 2016 are:

Organization

American Academy for Dermatology

American Academy of Environmental Engineers

American Academy of Health Physics

American Academy of Orthopaedic Surgeons

American Association of Physicists in Medicine

American Brachytherapy Society

American College of Cardiology

American College of Medical Physics

American College of Nuclear Physicians

American College of Occupational and Environmental Medicine

American College of Radiology

American Conference of Governmental Industrial Hygienists

American Dental Association

American Industrial Hygiene Association

American Institute of Ultrasound in Medicine

American Medical Association

American Nuclear Society
American Pharmacists Association
American Podiatric Medical Association
American Public Health Association
American Radium Society
American Roentgen Ray Society
American Society for Radiation Oncology
American Society of Emergency Radiology
American Society of Health-System Pharmacists
American Society of Nuclear Cardiology
American Society of Radiologic Technologists
American Thyroid Association
Association of Educators in Imaging and Radiological Sciences
Association of University Radiologists
Bioelectromagnetics Society
Campus Radiation Safety Officers
College of American Pathologists
Conference of Radiation Control Program Directors, Inc.
Council on Radionuclides and Radiopharmaceuticals
Defense Threat Reduction Agency
Electric Power Research Institute
Federal Aviation Administration
Federal Communications Commission
Federal Emergency Management Agency
Genetics Society of America
Health Physics Society
Institute of Electrical and Electronics Engineers, Inc.
Institute of Nuclear Power Operations
International Brotherhood of Electrical Workers
International Society of Exposure Science
National Aeronautics and Space Administration
National Association of Environmental Professionals
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry

National Electrical Manufacturers Association
National Institute for Occupational Safety and Health
National Institute of Standards and Technology
Nuclear Energy Institute
Office of Science and Technology
Paper, Allied-Industrial, Chemical and Energy Workers International Union
Product Stewardship Institute
Radiation Research Society
Radiological Society of North America
Society for Cardiovascular Angiography and Interventions
Society for Pediatric Radiology
Society for Risk Analysis
Society of Cardiovascular Computed Tomography
Society of Chairmen of Academic Radiology Departments
Society of Interventional Radiology
Society of Nuclear Medicine and Molecular Imaging
Society of Radiologists in Ultrasound
Society of Skeletal Radiology
U.S. Air Force
U.S. Army
U.S. Coast Guard
U.S. Department of Energy
U.S. Department of Housing and Urban Development
U.S. Department of Labor
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Navy
U.S. Nuclear Regulatory Commission
U.S. Public Health Service
Utility Workers Union of America

Special Liaison Organizations

Special Liaison relationships are established with various organizations outside of the United States that have an interest in radiation protection and measurements. This relationship provides: (1) an opportunity for participating organizations to designate an individual to provide liaison between the organization and NCRP; (2) that the individual designated will receive copies of draft NCRP publications (at the time that these are submitted to the members of the Council) with an invitation to comment but not vote; and (3) that new NCRP efforts might be discussed with liaison individuals as appropriate, so that they might have an opportunity to make suggestions on new studies and related matters. The Special Liaison Organizations for 2016 are:

Organization

Australian Radiation Protection and Nuclear Safety Agency

Bundesamt fur Strahlenschutz (Germany)
(Federal Office for Radiation Protection)

Canadian Association of Medical Radiation Technologists

Canadian Nuclear Safety Commission

Central Laboratory for Radiological Protection (Poland)

China Institute for Radiation Protection

Commissariat a l'Energie Atomique (France)

Commonwealth Scientific Instrumentation Research
Organization (Australia)

European Commission

Heads of the European Radiological Protection Competent
Authorities

Health Council of the Netherlands

International Commission on Non-Ionizing Radiation
Protection

International Commission on Radiation Units and
Measurements

International Commission on Radiological Protection

International Radiation Protection Association

Japan Radiation Council

Korea Institute of Nuclear Safety

Nuclear Safety Commission of Japan

Public Health England

Russian Scientific Commission on Radiation Protection

South African Forum for Radiation Protection

World Association for Nuclear Operators

World Health Organization, Unit of Radiation and Environmental Health

Corporate Sponsors

The Corporate Sponsor's Program facilitates the interchange of information and ideas, and corporate sponsors provide valuable fiscal support for the NCRP program. The Corporate Sponsors for 2016 are:

Organization

3M

Landauer, Inc.

Nuclear Energy Institute

Review Process

The review process for draft publications is elaborate and comprehensive. It begins with a review by a group of critical reviewers designated by the appropriate Program Area Committee Vice President and the NCRP Secretariat. Second, following modification of the draft on the basis of the comments of the critical reviewers, the publication is submitted for review to the full Council membership (98), Distinguished Emeritus Members (72), Collaborating Organizations (79), and Special Liaison Organizations (23). At the time a draft is submitted for Council review it is also placed on NCRP's website for public comment (http://NCRPonline.org). Further modification of draft reports on the basis of the comments received follows, with the goal of reaching a scientific consensus on the material included in the report. An NCRP report can be released for publication by the President only if there are no more than two remaining disapprovals by members of the Council after resolution of review comments.

In addition to full reports, NCRP also produces commentaries, statements, and presidential reports. NCRP commentaries are documents that provide preliminary evaluations, critiques, reviews and results of exploratory studies, or extensions of previously published NCRP reports on an accelerated schedule when time for the normal review process is not available. Approval is by the Board of Directors with involvement by other Council members to an extent dependent on the time available. Statements are brief documents that succinctly address topics of contemporary interest and importance for radiation protection. The review and approval process for statements is the same as for reports. Presidential reports are documents on specific issues in radiation health protection that are developed by a scientific committee, reviewed by members of Council and other subject-area experts as needed, and approved for publication by the Board of Directors and the President.

Lauriston S. Taylor Lectures

Year	Title	Lecturer
2016	Radiation Protection and Regulatory Science	John W. Poston, Sr.
2015	Dosimetry of Internal Emitters: Contributions of Radiation Protection Bodies and Radiological Events	Keith F. Eckerman
2014	On the Shoulders of Giants: Radiation Protection Over 50 Years	Fred A. Mettler, Jr.
2013	When Does Risk Assessment Get Fuzzy?	John E. Till
2012	From the Field to the Laboratory and Back: The *What Ifs*, *Wows*, and *Who Cares* of Radiation Biology	Antone L. Brooks
2011	What Makes Particle Radiation so Effective?	Eleanor A. Blakely
2010	Radiation Protection and Public Policy in an Uncertain World	Charles E. Land
2009	Radiation Epidemiology: The Golden Age and Remaining Challenges	John D. Boice, Jr.
2008	Radiation Standards, Dose/Risk Assessments, Public Interactions, and Yucca Mountain: Thinking Outside the Box	Dade W. Moeller
2007	The Quest for Therapeutic Actinide Chelators	Patricia W. Durbin
2006	Fifty Years of Scientific Investigation: The Importance of Scholarship and the Influence of Politics and Controversy	Robert L. Brent
2005	Nontargeted Effects of Radiation: Implications for Low-Dose Exposures	John B. Little
2004	Radiation Protection in the Aftermath of a Terrorist Attack Involving Exposure to Ionizing Radiation	Abel J. Gonzalez
2003	The Evolution of Radiation Protection—From Erythema to Genetic Risks to Risks of Cancer to ?	Charles B. Meinhold
2002	Developing Mechanistic Data for Incorporation into Cancer Risk Assessment: Old Problems and New Approaches	R. Julian Preston
2001	Assuring the Safety of Medical Diagnostic Ultrasound	Wesley L. Nyborg

2000	Administered Radioactivity: *Unde Venimus Quoque Imus*	S. James Adelstein
1999	Back to Background	Naomi H. Harley
1998	From Chimney Sweeps to Astronauts: Cancer Risks in the Work Place	Eric J. Hall
1997	Radionuclides in the Body: Meeting the Challenge	William J. Bair
1996	70 Years of Radiation Genetics: Fruit Flies, Mice and Humans	Seymour Abrahamson
1995	Certainty and Uncertainty in Radiation Research	Albrecht M. Kellerer
1994	Mice, Myths, and Men	R.J. Michael Fry
1993	Science, Radiation Protection and the NCRP	Warren K. Sinclair
1992	Dose and Risk in Diagnostic Radiology: How Big? How Little?	Edward W. Webster
1991	When is a Dose Not a Dose?	Victor P. Bond
1990	Radiation Protection and the Internal Emitter Saga	J. Newell Stannard
1989	Radiobiology and Radiation Protection: The Past Century and Prospects for the Future	Arthur C. Upton
1988	How Safe is Safe Enough?	Bo Lindell
1987	How to be Quantitative about Radiation Risk Estimates	Seymour Jablon
1986	Biological Effects of Non-Ionizing Radiations: Cellular Properties and Interactions	Herman P. Schwan
1985	Truth (and Beauty) in Radiation Measurements	John H. Harley
1984	Limitation and Assessment in Radiation Protection	Harald H. Rossi
1983	The Human Environment—Past, Present and Future	Merril Eisenbud
1982	Ethics, Trade-Offs and Medical Radiation	Eugene L. Saenger
1981	How Well Can We Assess Genetic Risk? Not Very	James F. Crow
1980	From “Quantity of Radiation” and “Dose” to “Exposure” and “Absorbed Dose”—An Historical Review	Harold O. Wyckoff
1979	Radiation Protection—Concepts and Trade Offs	Hymer L. Friedell
1978	Why be Quantitative About Radiation Risk Estimates?	Sir Edward Pochin
1977	The Squares of the Natural Numbers in Radiation Protection	Herbert M. Parker

Warren K. Sinclair Keynote Addresses

Year	Title	Lecturer
2016	WARP: Where are the Radiation Professionals?	Richard E. Toohey
2015	Influence of NCRP on Radiation Protection in the United States: Guidance and Regulation	Kenneth R. Kase
2014	Science, Radiation Protection, and the NCRP: Building on the Past, Looking to the Future	Jerrold T. Bushberg
2013	Fukushima Nuclear Power Plant Accident and Comprehensive Health Risk Management	Shunichi Yamashita
2012	Childhood Exposure: An Issue from Computed Tomography Scans to Fukushima	Fred A. Mettler, Jr.
2011	Heavy Ions in Therapy and Space: Benefits and Risks	Marco Durante
2010	Effective Risk Communication Before, During and After a Radiological Emergency: Challenges, Guidelines, Strategies and Tools	Vincent T. Covello
2009	The Role of a Strong Regulator in Safe and Secure Nuclear Energy	Peter B. Lyons
2008	Issues in Quantifying the Effects of Low-Level Radiation	Dudley T. Goodhead
2007	Use and Misuse of Radiation in Medicine	James A. Brink
2006	Retrospective Analysis of Impacts of the Chernobyl Accident	Mikhail Balonov
2005	Contemporary Issues in Risk-Informed Decision Making on Waste Disposition	B. John Garrick
2004	Current Challenges in Countering Radiological Terrorism	John W. Poston, Sr.

NCRP

Thomas S. Tenforde Topical Lecture

Year	Title	Lecturer
2015	Ethics and Radiation Protection	Jacques Lochard

Annual Meetings

Year	Topic
2016	Meeting the Needs of the Nation for Radiation Protection
2015	Changing Regulations and Radiation Guidance: What Does the Future Hold?
2014	NCRP: Achievements of the Past 50 Years and Addressing the Needs of the Future
2013	Radiation Dose and the Impacts on Exposed Populations
2012	Emerging Issues in Radiation Protection in Medicine, Emergency Response, and the Nuclear Fuel Cycle
2011	Scientific and Policy Challenges of Particle Radiations in Medical Therapy and Space Missions
2010	Communication of Radiation Benefits and Risks in Decision Making
2009	Future of Nuclear Power Worldwide: Safety, Health and Environment
2008	Low Dose and Low Dose-Rate Radiation Effects and Models
2007	Advances in Radiation Protection in Medicine
2006	Chernobyl at Twenty
2005	Managing the Disposition of Low-Activity Radioactive Materials
2004	Advances in Consequence Management for Radiological Terrorism Events
2003	Radiation Protection at the Beginning of the 21st Century—A Look Forward
2002	Where the New Biology Meets Epidemiology: Impact on Radiation Risk Estimates
2001	Fallout from Atmospheric Nuclear Tests—Impact on Science and Society
2000	Ionizing Radiation Science and Protection in the 21st Century
1999	Radiation Protection in Medicine: Contemporary Issues
1998	Cosmic Radiation Exposure of Airline Crews, Passengers and Astronauts
1997	The Effects of Pre- and Postconception Exposure to Radiation
1996	Implications of New Data on Radiation Cancer Risk
1995	Environmental Dose Reconstruction and Risk Implications
1994	Extremely-Low-Frequency Electromagnetic Fields: Issues in Biological Effects and Public Health
1993	Radiation Science and Societal Decision Making

1992	Radiation Protection in Medicine
1991	Genes, Cancer and Radiation Protection
1990	Health and Ecological Implications of Radioactively Contaminated Environments
1989	Radiation Protection Today—The NCRP at Sixty Years
1988	Radon
1987	New Dosimetry at Hiroshima and Nagasaki and Its Implications for Risk Estimates
1986	Nonionizing Electromagnetic Radiations and Ultrasound
1985	Radioactive Waste
1984	Some Issues Important in Developing Basic Radiation Protection Recommendations
1983	Environmental Radioactivity
1982	Radiation Protection and New Medical Diagnostic Approaches
1981	Critical Issues in Setting Radiation Dose Limits
1980	Quantitative Risk in Standards Setting
1979	Perceptions of Risk

2016 Annual Meeting

The Fifty-Second Annual Meeting of NCRP was held April 11–12, 2016 at the Hyatt Regency Bethesda in Bethesda, Maryland. The topic of the meeting was "Meeting the Needs of the Nation for Radiation Protection." The sessions and presentations were as follows:

Thirteenth Annual Warren K. Sinclair Keynote Address

WARP: Where are the Radiation Professionals?, Richard E. Toohey

How Did We Get Here?

Radiation Brain Drain? The Impact of Demographic Change on U.S. Radiation Protection, Hedvig Hricak

Membership Trends in the Health Physics Society: How Did We Get Here and Where Are We Going?, Kathryn H. Pryor

Review of the Workforce for Radiation Protection in Medicine, Wayne D. Newhauser

Changing Roles of State Health Physicists, Ruth E. McBurney

Where Do We Need To Be?

Commercial Nuclear Power: Assessing and Meeting the Need, Jerry W. Hiatt

Education or Training: Does it Matter?, Kathryn A. Higley

Estimating Cancer Risks at Very Low Radiation Doses: What Can be Done?, David J. Brenner

Developing a Radiation Protection Hub, Nolan Hertel

Meeting Regulatory Needs, Michael Weber

Fortieth Lauriston S. Taylor Lecture on Radiation Protection and Measurements
Radiation Protection and Regulatory Science, John W. Poston, Sr.

How Do We Get There?
Critical Issues in Knowledge Management in Domestic Radiation Protection Research Capabilities, Shaheen Dewji
The Business of Health Physics: Jobs in a Changing Market, Matthew P. Moeller
Meeting the Needs of First Responders: Scientific Experiments to Operational Tactics for the First 100 Minutes After an Outdoor Explosive Radiological Dispersal Device, Stephen V. Musolino
Meeting the Needs of the Nation for Radiation Protection: How Do We Get There? Meeting Medical Needs, Donald P. Frush

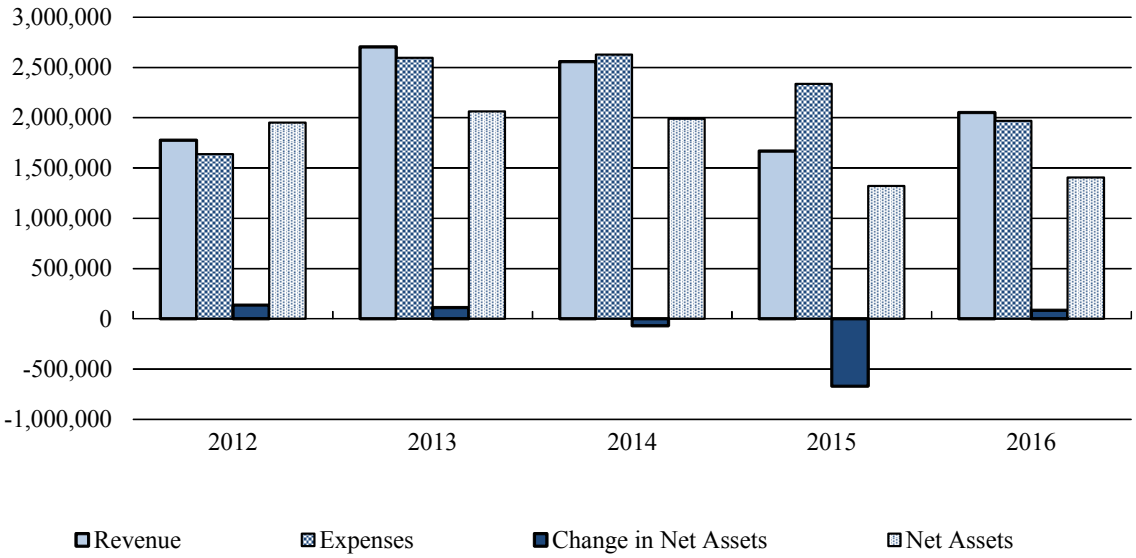
Conclusions
NCRP Vision for the Future and Program Area Committee Activities, John D. Boice, Jr.

Serving on the Program Committee for the 2016 Annual Meeting were: *Co-Chairs*, Richard E. Toohey, Kathryn H. Pryor, and Judith L. Bader; and Committee members, Donald P. Frush, Pamela J. Henderson, Jerry W. Hiatt, Kathryn A. Higley, William E. Kennedy, Jr., Chad A. Mitchell, Wayne D. Newhauser, Robert C. Whitcomb, Jr., Jacqueline P. Williams, and Patricia R. Worthington. The proceedings of the 2016 Annual Meeting will be published in *Health Physics.*

Financial Summary

The table and bar graph presented below exhibit NCRP's year-end financial data for 2016 and the four preceding years in the categories: (1) total revenue from grants, contracts, contributions, corporate sponsorships, contributed professional services, administrative services, sales of publications, and investments; (2) total operating and investment expenses; (3) change in net assets of the corporation; and (4) net assets.

Year	Revenue	Expenses	Change in Net Assets	Net Assets
2012	1,776,001	1,638,754	137,247	1,951,574
2013	2,706,268	2,595,346	110,922	2,062,496
2014	2,558,691	2,629,610	(70,919)	1,991,577
2015	1,668,085	2,337,573	(669,488)	1,322,089
2016	2,052,919	1,968,950	83,969	1,406,058



Appendix 1. Finances

Exhibit A
Statement of Financial Position
For the year ended December 31, 2016

(unaudited)

Current Assets	
Cash and cash equivalents	$ 148,001
Investments [at market]	1,185,953
Accounts receivable:	
Publications	3,043
Grants and contracts	70,691
International Commission on Radiation Units and Measurements	1,315
Other	1,000
Inventory—publications	297,765
Prepaid expenses and other assets	17,710
Total current assets	1,725,478
Property and Equipment [at cost]	
Furniture and equipment	179,987
Less accumulated depreciation	(169,149)
Total property and equipment	10,838
TOTAL ASSETS	$ 1,736,316
Liabilities	
Line of credit	—
Accounts payable and accrued expenses	172,833
Total current liabilities	172,833
Other Liabilities	
Deferred rent liability	15,473
Accrued post-retirement benefits	141,952
Total other liabilities	157,425
TOTAL LIABILITIES	330,258

Net Assets	
Unrestricted:	
Undesignated	66,374
Board designated	1,076,321
Temporarily restricted	228,363
Permanently restricted	35,000
TOTAL NET ASSETS	1,406,058
TOTAL LIABILITIES AND NET ASSETS	$ 1,736,316

Exhibit B
Statement of Activities
For the year ended December 31, 2016
(unaudited)

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Revenue and Other Increases				
Contracts and grants	$ 1,401,272	$ —	$ —	$ 1,401,272
Contributions	138,032	10,000	—	148,032
Corporate sponsorship	25,000	—	—	25,000
Contributed professional services	168,350	—	—	168,350
Sales of publications	145,251	—	—	145,251
Dividends and interest	40,040	7,568	—	47,608
Net realized and unrealized gain on investments	95,409	10,475	—	105,884
Professional and administrative services	11,522	—	—	11,522
Total revenue and other increases	2,024,876	28,043	—	2,052,919
Expenses and Other Decreases				
Program costs:				
Contracts and grants	823,621	—	—	823,621
Publications	64,239	—	—	64,239
Contributed professional services	168,350	—	—	168,350
Total program costs	1,056,210	—	—	1,056,210
Management and general expenses	908,525	—	—	908,525
Total expenses	1,964,735	—	—	1,964,735
Investment fees	12,586	1,550	—	14,136
Post-retirement benefit change	(9,921)	—	—	(9,921)
	1,967,400	1,550	—	1,968,950
Change in Net Assets	57,476	26,493	—	83,969
Net Assets at Beginning of Year	1,085,219	201,870	35,000	1,322,089
Net Assets at End of Year	$ 1,142,695	$ 228,363	$ 35,000	$ 1,406,058

Exhibit C
Statement of Cash Flow
For the year ended December 31, 2016

(unaudited)

Cash flows from operating activities:	
Change in net assets	$ 83,969
Adjustments to reconcile change in net assets to cash provided by operating activities	
Depreciation	7,190
Net realized and unrealized gain on investments	(105,884)
(Increase) decrease in assets:	
Accounts receivable	72,844
Inventory—publications	4,651
Prepaid expenses and other assets	(1,397)
Increase (decrease) in liabilities:	
Accounts payable and accrued expenses	(78,125)
Deferred rent liability	14,254
Accrued post-retirement benefits	(10,554)
Net cash used by operating activities	(13,052)
Cash flows from investing activities:	
Purchase of equipment	(6,115)
Purchase of investments	(52,863)
Sale of investments	518,630
Net cash used by investing activities	459,652
Cash flows from financing activities:	
Net repayments on line of credit	(355,000)
Net increase in cash and cash equivalents	91,600
Cash and cash equivalents at beginning of year	56,401
Cash and cash equivalents at end of year	$ 148,001

Schedule 1
Schedule of Contracts and Grants Revenue
For the year ended December 31, 2016

(unaudited)

Contracts	
New York City Department of Health and Mental Hygiene	$ 52,039
U.S. Department of Homeland Security	122,871
Total contracts	**174,910**
Grants	
Centers for Disease Control and Prevention	296,456
National Aeronautics and Space Administration	415,687
U.S. Department of Energy	48,609
U.S. Food and Drug Administration	5,000
U.S. Nuclear Regulatory Commission	460,610
Total grants	**1,226,362**
Total contracts and grants revenue	**$ 1,401,272**

Schedule 2
Schedule of Contributions & Corporate Sponsorship Revenue
For the year ended December 31, 2016

(unaudited)

Contributions	
American Academy of Health Physics*	$ 1,000
American Association of Physicists in Medicine	5,400
American College of Radiology Foundation	25,000
American Registry of Radiologic Technologists	6,000
American Roentgen Ray Society	7,500
American Society for Radiation Oncology	3,000
American Society of Radiologic Technologists	6,000
Conference of Radiation Control Program Directors, Inc.	2,000
Council on Radionuclides and Radiopharmaceuticals	2,000
Duke University Medical Center, Department of Radiology	800
Health Physics Society	12,000
Individuals	31,832
Institute of Electrical and Electronics Engineers	3,000
Landauer, Inc.	3,000
Oak Ridge Associated Universities	1,000
Radiological Society of North America	25,000
Society of Nuclear Medicine and Molecular Imaging	2,500
Society of Pediatric Radiology	1,000
Total contributions	**$ 138,032**
Corporate Sponsors	
3M	$ 5,000
Landauer, Inc.	10,000
Nuclear Energy Institute	10,000
Total Corporate Sponsors	**$ 25,000**

*Contribution pledged in 2016 but received in January 2017.

Appendix 2. Publications

Distribution of NCRP Publications

(during the period May 16, 1931 through December 31, 2016)

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
NCRP Reports						
175	Decision Making for Late-Phase Recovery from Major Nuclear or Radiological Incidents (2014)	__d	30	19	305	305
174	Preconception and Prenatal Radiation Exposure: Health Effects and Protective Guidance (2013)	__d	18	19	400	400
173	Investigation of Radiological Incidents (2012)	__d	9	4	296	296
172	Reference Levels and Achievable Doses in Medical and Dental Imaging: Recommendations for the United States (2012)	__d	5	36	647	647
171	Uncertainties in the Estimation of Radiation Risks and Probability of Disease Causation (2012)	__d	10	10	325	325
170	Second Primary Cancers and Cardiovascular Disease After Radiation Therapy (2011)	__d	6	2	264	264
169	Design of Effective Radiological Effluent Monitoring and Environmental Surveillance Programs (2010)	__d	5	3	237	237
168	Radiation Dose Management for Fluoroscopically-Guided Interventional Medical Procedures (2010)	__d	11	19	844	844
167	Potential Impact of Genetic Susceptibility and Previous Radiation Exposure on Radiation Risk for Astronauts (2010)	__d	3	3	181	181
166	Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident (2010)	__d	11	7	375	375
165	Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers (2010)	__d	16	9	974	974
164	Uncertainties in Internal Radiation Dosimetry (2009)	__d	0	12	201	201
163	Radiation Dose Reconstruction: Principles and Practices (2009)	__d	8	3	381	381
162	Self Assessment of Radiation-Safety Programs (2009)	__d	9	5	578	578

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
161	Management of Persons Contaminated with Radionuclides (2009)	__d	17	43	1,396	1,396
160	Ionizing Radiation Exposure of the Population of the United States (2009)	__d	29	32	1,790	1,790
159	Risk to the Thyroid from Ionizing Radiation (2008)	__d	7	4	311	311
158	Uncertainties in the Measurement and Dosimetry of External Radiation (2007)	__d	5	3	731	731
157	Radiation Protection in Educational Institutions (2007)	__d	11	27	910	910
156	Development of a Biokinetic Model for Radionuclide-Contaminated Wounds and Procedures for Their Assessment, Dosimetry and Treatment (2006)	__d	6	4	811	811
155	Management of Radionuclide Therapy Patients (2006)	__d	9	19	1,220	1,220
154	Cesium-137 in the Environment: Radioecology and Approaches to Assessment and Management (2006)	__d	3	5	605	605
153	Information Needed to Make Radiation Protection Recommendations for Space Missions Beyond Low-Earth Orbit (2006)	__d	2	3	730	730
152	Performance Assessment of Near-Surface Facilities for Disposal of Low-Level Radioactive Waste (2005)	__d	2	2	594	594
151	Structural Shielding Design and Evaluation for Megavoltage X- and Gamma-Ray Radiotherapy Facilities (2005)	__d	16	46	3,695	3,695
150	Extrapolation of Radiation-Induced Cancer Risks from Nonhuman Experimental Systems to Humans (2005)	__d	2	0	726	726
149	A Guide to Mammography and Other Breast Imaging Procedures (2004)	__d	4	0	1,182	1,182
148	Radiation Protection in Veterinary Medicine (2004)	__d	6	11	1,285	1,285
147	Structural Shielding Design for Medical X-Ray Imaging Facilities (2004)	__d	22	81	4,671	4,671
	Compact disk version of Report No. 147	__d	0	0	143	143
146	Approaches to Risk Management in Remediation of Radioactively Contaminated Sites (2004)	__d	2	0	1,117	1,117
145	Radiation Protection in Dentistry (2003)	__d	12	48	2,481	2,481
144	Radiation Protection for Particle Accelerator Facilities (2003)	__d	8	36	2,310	2,310
143	Management Techniques for Laboratories and Other Small Institutional Generators to Minimize Off-Site Disposal of Low-Level Radioactive Waste (2003)	__d	2	0	740	740

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b]		Total NCRP Publications[c]	All Sources Combined
			2016			
			Hardcopy	E-Pub		
142	Operational Radiation Safety Program for Astronauts in Low-Earth Orbit: A Basic Framework (2002)	__d	1	2	1,166	1,166
141	Managing Potentially Radioactive Scrap Metal (2002)	__d	2	0	1,248	1,248
140	Exposure Criteria for Medical Diagnostic Ultrasound: II. Criteria Based on All Known Mechanisms (2002)	__d	3	0	829	829
139	Risk-Based Classification of Radioactive and Hazardous Chemical Wastes (2002)	__d	2	1	1,004	1,004
138	Management of Terrorist Events Involving Radioactive Material (2001)	__d	6	3	7,620	7,620
137	Fluence-Based and Microdosimetric Event-Based Methods for Radiation Protection in Space (2001)	__d	4	3	788	788
136	Evaluation of the Linear-Nonthreshold Dose-Response Model for Ionizing Radiation (2001)	__d	4	1	1,405	1,405
135	Liver Cancer Risk from Internally-Deposited Radionuclides (2001)	__d	2	0	1,122	1,122
134	Operational Radiation Safety Training (2000)	__d	2	2	1,370	1,370
133	Radiation Protection for Procedures Performed Outside the Radiology Department (2000)	__d	4	4	1,732	1,732
132	Radiation Protection Guidance for Activities in Low-Earth Orbit (2000)	__d	4	7	1,062	1,062
131	Scientific Basis for Evaluating the Risks to Populations from Space Applications of Plutonium (2001)	__d	1	0	804	804
130	Biological Effects and Exposure Limits for “Hot Particles” (1999)	__d	4	4	1,153	1,153
129	Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies (1999)	__d	4	2	1,702	1,702
128	Radionuclide Exposure of the Embryo/Fetus (1998)	__d	3	2	1,622	1,622
127	Operational Radiation Safety Program (1998)	__d	19	25	2,498	2,498
126	Uncertainties in Fatal Cancer Risk Estimates Used in Radiation Protection (1997)	__d	5	4	1,909	1,909
125	Deposition, Retention and Dosimetry of Inhaled Radioactive Substances (1997)	__d	3	5	2,578	2,578
124	Sources and Magnitude of Occupational and Public Exposures from Nuclear Medicine Procedures (1996)	__d	2	7	3,220	3,220
123	Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground (1996)	__d	2	8	3,237	3,237

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
122	Use of Personal Monitors to Estimate Effective Dose Equivalent and Effective Dose to Workers for External Exposure to Low-LET Radiation (1995)	__d	22	5	3,399	3,399
121	Principles and Application of Collective Dose in Radiation Protection (1995)	__d	1	1	2,472	2,472
120	Dose Control at Nuclear Power Plants (1994)	__d	2	0	3,010	3,010
119	A Practical Guide to the Determination of Human Exposure to Radiofrequency Fields (1993)	__d	1	5	3,533	3,533
118	Radiation Protection in the Mineral Extraction Industry (1993)	__d	1	0	2,647	2,647
117	Research Needs for Radiation Protection (1993)	__d	1	0	1,958	1,958
116	Limitation of Exposure to Ionizing Radiation (1993)	__d	7	24	7,360	7,360
115	Risk Estimates for Radiation Protection (1993)	__d	2	1	3,193	3,193
114	Maintaining Radiation Protection Records (1992)	__d	1	2	2,474	2,474
113	Exposure Criteria for Medical Diagnostic Ultrasound: I. Criteria Based on Thermal Mechanisms (1992)	__d	1	0	3,288	3,288
112	Calibration of Survey Instruments Used in Radiation Protection for the Assessment of Ionizing Radiation Fields and Radioactive Surface Contamination (1991)	__d	2	8	3,870	3,870
111	Developing Radiation Emergency Plans for Academic, Medical and Industrial Facilities (1991)	__d	2	1	4,090	4,090
110	Some Aspects of Strontium Radiobiology (1991)	__d	1	6	2,575	2,575
109	Effects of Ionizing Radiation on Aquatic Organisms (1991)	__d	1	1	2,213	2,213
108	Conceptual Basis for Calculations of Absorbed-Dose Distributions (1991)	__d	1	0	3,140	3,140
107	Implementation of the Principle of As Low As Reasonably Achievable (ALARA) for Medical and Dental Personnel (1990)	__d	1	2	3,406	3,406
106	Limit for Exposure to “Hot Particles” on the Skin (1990)	__d	1	1	2,890	2,890
105	Radiation Protection for Medical and Allied Health Personnel (1989)	__d	2	8	6,850	6,850
104	The Relative Biological Effectiveness of Radiations of Different Quality (1990)	__d	1	1	2,420	2,420
103	Control of Radon in Houses (1989)	__d	2	0	3,769	3,769
102	Medical X-Ray, Electron Beam and Gamma-Ray Protection for Energies up to 50 MeV (Equipment Design, Performance and Use) (1989)	__d	5	9	7,844	7,844
101	Exposure of the U.S. Population from Occupational Radiation (1989)	__d	1	0	4,165	4,165

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b]		Total NCRP Publications[c]	All Sources Combined
			2016			
			Hardcopy	E-Pub		
100	Exposure of the U.S. Population from Diagnostic Medical Radiation (1989)	__d	1	0	4,984	4,984
99	Quality Assurance for Diagnostic Imaging (1988)	__d	1	3	4,872	4,872
98	Guidance on Radiation Received in Space Activities (1989)	__d	0	8	3,413	3,413
97	Measurement of Radon and Radon Daughters in Air (1988)	__d	1	9	4,258	4,258
96	Comparative Carcinogenicity of Ionizing Radiation and Chemicals (1989)	__d	1	0	4,098	4,098
95	Radiation Exposure of the U.S. Population from Consumer Products and Miscellaneous Sources (1987)	__d	2	1	4,288	4,288
94	Exposure of the Population in the United States and Canada from Natural Background Radiation (1987)	__d	1	2	4,436	4,436
93	Ionizing Radiation Exposure of the Population of the United States (1987)	__d	2	1	7,395	7,395
92	Public Radiation Exposure from Nuclear Power Generation in the United States (1987)	__d	1	0	3,691	3,691
91	Recommendations on Limits for Exposure to Ionizing Radiation (1987)	__d	0	0	8,486	8,486
90	Neptunium: Radiation Protection Guidelines (1988)	__d	1	0	2,909	2,909
89	Genetic Effects from Internally Deposited Radionuclides (1987)	__d	1	0	3,968	3,968
88	Radiation Alarms and Access Control Systems (1986)	__d	1	0	4,815	4,815
87	Use of Bioassay Procedures for Assessment of Internal Radionuclide Deposition (1987)	__d	1	4	4,266	4,266
86	Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields (1986)	__d	1	10	5,320	5,320
85	Mammography—A User's Guide (1986)	__d	0	0	32,655	32,655
84	General Concepts for the Dosimetry of Internally Deposited Radionuclides (1985)	__d	1	2	4,264	4,264
83	The Experimental Basis for Absorbed-Dose Calculations in Medical Uses of Radionuclides (1985)	__d	1	0	3,552	3,552
82	SI Units in Radiation Protection and Measurements (1985)	__d	2	0	4,591	4,591
81	Carbon-14 in the Environment (1985)	__d	1	1	4,002	4,002
80	Induction of Thyroid Cancer by Ionizing Radiation (1985)	__d	0	1	4,272	4,272
79	Neutron Contamination from Medical Electron Accelerators (1984)	__d	0	4	4,849	4,849
78	Evaluation of Occupational and Environmental Exposures to Radon and Radon Daughters in the United States (1984)	__d	1	0	6,480	6,480

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
77	Exposures from the Uranium Series with Emphasis on Radon and Its Daughters (1984)	__d	1	0	6,656	6,656
76	Radiological Assessment: Predicting the Transport, Bioaccumulation, and Uptake by Man of Radionuclides Released to the Environment (1984)	__d	2	1	6,694	6,694
75	Iodine-129: Evaluation of Release from Nuclear Power Generation (1983)	__d	1	0	5,949	5,949
74	Biological Effects of Ultrasound: Mechanisms and Clinical Implications (1983)	__d	1	4	11,232	11,232
73	Protection in Nuclear Medicine and Ultrasound Diagnostic Procedures in Children (1983)	__d	1	0	5,504	5,504
72	Radiation Protection and Measurement for Low-Voltage Neutron Generators (1983)	__d	1	0	4,453	4,453
71	Operational Radiation Safety—Training (1983)	__d	0	0	5,074	5,074
70	Nuclear Medicine—Factors Influencing the Choice and Use of Radionuclides in Diagnosis and Therapy (1982)	__d	1	0	5,418	5,418
69	Dosimetry of X-Ray and Gamma-Ray Beams for Radiation Therapy in the Energy Range 10 keV to 50 MeV (1981)	__d	3	0	5,029	5,029
68	Radiation Protection in Pediatric Radiology (1981)	__d	1	1	4,509	4,509
67	Radiofrequency Electromagnetic Fields—Properties, Quantities and Units, Biophysical Interaction and Measurements (1981)	__d	1	3	5,460	5,460
66	Mammography (1980)	__d	0	0	4,598	4,598
65	Management of Persons Accidentally Contaminated with Radionuclides (1980)	__d	1	2	18,449	18,449
64	Influence of Dose and Its Distribution in Time on Dose-Response Relationships for Low-LET Radiations (1980)	__d	1	0	5,252	5,252
63	Tritium and Other Radionuclide Labeled Organic Compounds Incorporated in Genetic Material (1979)	__d	1	1	4,331	4,331
62	Tritium in the Environment (1979)	__d	1	4	3,971	3,971
61	Radiation Safety Training Criteria for Industrial Radiography (1978)	__d	1	0	6,177	6,177
60	Physical, Chemical and Biological Properties of Radiocerium Relevant to Radiation Protection Guidelines (1979)	__d	1	0	4,036	4,036
59	Operational Radiation Safety Program (1979)	__d	0	0	8,046	8,046
58	A Handbook of Radioactivity Measurements Procedures (1978)	__d	1	2	13,645	13,645

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
57	Instrumentation and Monitoring Methods for Radiation Protection (1978)	__d	2	1	10,984	10,984
56	Radiation Exposure from Consumer Products and Miscellaneous Sources (1977)	__d	__e	0	5,905	5,905
55	Protection of the Thyroid Gland in the Event of Releases of Radioiodine (1977)	__d	1	2	6,847	6,847
54	Medical Radiation Exposure of Pregnant and Potentially Pregnant Women (1977)	__d	1	0	10,609	10,609
53	Review of NCRP Radiation Dose Limit for Embryo and Fetus in Occupationally Exposed Women (1977)	__d	__e	0	9,289	9,289
52	Cesium-137 from the Environment to Man: Metabolism and Dose (1977)	__d	1	5	4,713	4,713
51	Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities (1977)	__d	0	0	8,513	8,513
50	Environmental Radiation Measurements (1976)	__d	2	0	7,929	7,929
49	Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies up to 10 MeV (1976)	__d	1	26	17,726	17,726
	Adjunct to NCRP Report 49 (1976)	__d	0	0	2,797	2,797
48	Radiation Protection for Medical and Allied Health Personnel (1976)	__d	__e	0	14,359	14,359
47	Tritium Measurement Techniques (1976)	__d	1	1	6,394	6,394
46	Alpha-Emitting Particles in Lungs (1975)	__d	1	0	6,090	6,090
45	Natural Background Radiation in the United States (1975)	__d	__e	0	7,296	7,296
44	Krypton-85 in the Atmosphere—Accumulation, Biological Significance, and Control Technology (1975)	__d	1	0	6,574	6,574
43	Review of the Current State of Radiation Protection Philosophy (1975)	__d	__e	0	9,722	9,722
42	Radiological Factors Affecting Decision-Making in a Nuclear Attack (1974)	__d	2	0	47,249	47,249
41	Specification of Gamma-Ray Brachytherapy Sources (1974)	__d	1	0	5,476	5,476
40	Protection Against Radiation from Brachytherapy Sources (1972)	__d	0	1	9,809	9,809
39	Basic Radiation Protection Criteria (1971)	__d	__e	0	40,393	40,393
38	Protection Against Neutron Radiation (1971)	__d	1	2	8,994	8,994
37	Precautions in the Management of Patients who have Received Therapeutic Amounts of Radionuclides (1970)	__d	0	0	17,402	17,402

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
36	Radiation Protection in Veterinary Medicine (1970)	__d	0	0	7,620	7,620
35	Dental X-Ray Protection (1970)	__d	0	0	28,559	28,559
34	Medical X-Ray and Gamma-Ray Protection for Energies up to 10 MeV—Structural Shielding Design and Evaluation (1970)	__d	__e	0	17,662	17,662
33	Medical X-Ray and Gamma-Ray Protection for Energies up to 10 MeV—Equipment Design and Use (1968)	__d	__e	0	98,134	98,134
32	Radiation Protection in Educational Institutions (1966)	__d	1	0	22,363	22,363
31	Shielding for High Energy Electron Accelerator Installations (1964)	3,700	__e	0	2,697	6,397
30	Safe Handling of Radioactive Materials (1964)	24,450	1	0	9,953	34,403
29	Exposure to Radiation in an Emergency	55,705	__e	0	3,678	59,383
28	A Manual of Radioactivity Procedures (1961)	22,892	__e	0	3,665	26,557
27	Stopping Powers for Use with Cavity Chambers (1961)	4,144	1	0	3,836	7,980
26	Medical X-Ray Protection up to Three Million Volts (1961)	75,894	__e	0	27,154	103,048
25	Measurement of Absorbed Dose of Neutrons and Mixtures of Neutrons and Gamma Rays (1961)	10,790	0	0	4,083	14,873
24	Protection Against Radiations from Sealed Gamma Sources (1960)	35,710	__e	0	953	36,663
23	Measurement of Neutron Flux and Spectra for Physical and Biological Applications (1960)	11,849	0	0	3,073	14,992
22	Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure (1959)	52,526	1	0	7,449	59,975
21	Safe Handling of Bodies Containing Radioactive Isotopes (1958)	29,304	__e	0	2,352	31,656
20	Protection Against Neutron Radiation up to 30 Million Electron Volts (1957)	16,989	__e	0	353	17,342
19	Regulation of Radiation Exposure by Legislative Means (1955)	15,140	__e	0	0	15,140
18	X-Ray Protection (1955)	98,713	__e	0	0	98,713
17	Permissible Dose from External Sources of Ionizing Radiation (1954)	60,530	__e	0	2,038	62,568
16	Radioactive Waste Disposal in the Ocean (1954)	16,203	__e	0	2,664	18,867
15	Safe Handling of Cadavers Containing Radioactive Isotopes (1953)	14,486	__e	0	0	14,486
14	Protection Against Betatron-Synchrotron Radiations up to 100 Million Electron Volts (1954)	27,190	__e	0	1,710	28,900

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
13	Protection Against Radiation from Radium, Cobalt-60 and Cesium-137 (1954)	22,785	__e	0	0	22,785
12	Recommendations for the Disposal of Carbon-14 Wastes (1953)	23,506	__e	0	2,571	26,077
11	Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water (1953)	32,494	__e	0	0	32,494
10	Radiological Monitoring Methods and Instruments (1952)	59,651	__e	0	3,894	63,545
9	Recommendations for Waste Disposal of Phosphorus-32 and Iodine-131 for Medical Users (1951)	28,810	__e	0	5,682	34,492
8	Control and Removal of Radioactive Contamination in Laboratories (1951)	50,500	2	0	7,659	58,159
7	Safe Handling of Radioactive Isotopes (1949)	60,867	__e	0	0	60,867
6	Medical X-Ray Protection up to Two Million Volts (1949)	70,261	__e	0	0	70,261
5	Safe Handling of Radioactive Luminous Compounds (1941)	6,187	__e	0	0	6,187
4	Radium Protection (1938)	10,086	__e	0	0	10,086
3	X-Ray Protection (1936)	16,490	__e	0	0	16,490
2	Radium Protection (1934)	__g	__e	0	0	0
1	X-Ray Protection (1931)	1,596	__e	0	0	1,596
	Total NCRP Reports Distributed	959,448	504	772	957,310	1,916,758
Lauriston S. Taylor Lectures						
39	Dosimetry of Internal Emitters: Contributions of Radiation Protection Bodies and Radiological Events, Keith F. Eckerman (2015), Health Phys. **110**(2), 192–200 (2016)	__i	__i	__i		__i
38	On the Shoulders of Giants: Radiation Protection Over 50 Years, Fred A. Mettler, Jr. (2014), Health Phys. **108**(2), 102–110 (2015)	__i	__i	__i		__i
37	When Does Risk Assessment Get Fuzzy?, John E. Till (2013), Health Phys. **106**(2), 148–161 (2014)	__i	__i	__i		__i
36	From the Field to the Laboratory and Back: The *What Ifs*, *Wows,* and *Who Cares* of Radiation Biology, Antone L. Brooks (2012), Health Phys. **105**(5), 407–421 (2013)	__i	__i	__i		__i
35	What Makes Particle Radiation So Effective?, Eleanor A. Blakely (2011), Health Phys. **103**(5),508–528 (2012)	__i	__i	__i		__i
34	Radiation Protection and Public Policy in an Uncertain World, Charles E. Land (2010), Health Phys. **101**(5), 499–508 (2011)	__i	__i	__i		__i

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
33	Radiation Epidemiology: The Golden Age and Remaining Challenges, John D. Boice, Jr. (2009), Health Phys. **100**(1) 59-76 (2011)	__i	__i	__i		__i
32	Radiation Standards, Dose/Risk Assessments, Public Interactions, and Yucca Mountain: Thinking Outside the Box, Dade W. Moeller (2008,) Health Phys. **97**, 376–391 (2009)	__i	__i	__i		__i
31	The Quest for Therapeutic Actinide Chelators, Patricia W. Durbin (2007), Health Phys. **95**, 465–492 (2008)	__i	__i	__i		__i
30	Fifty Years of Scientific Investigation: The Importance of Scholarship and the Influence of Politics and Controversy, Robert L. Brent (2006), Health Phys. **93**, 348–379 (2007)	__i	__i	__i		__i
29	Nontargeted Effects of Radiation: Implications for Low-Dose Exposures, John B. Little (2005), Health Phys. **91**, 416–426 (2006)	__i	__i	__i		__i
28	Radiation Protection in the Aftermath of a Terrorist Attack Involving Exposure to Ionizing Radiation, Abel J. Gonzalez (2004), Health Phys. **89**, 418–446 (2005)	__i	__i	__i		__i
27	The Evolution of Radiation Protection–From Erythema to Genetic Risks to Risks of Cancer to ? Charles B. Meinhold (2003), Health Phys. **87**, 240–248 (2004)	__i	__i	__i		__i
26	Developing Mechanistic Data for Incorporation into Cancer and Genetic Risk Assessments: Old Problems and New Approaches, R. Julian Preston (2002), Health Phys. **85**, 4–12 (2003)	__i	__i	__i		__i
25	Assuring the Safety of Medical Diagnostic Ultrasound, Wesley L. Nyborg (2001), Health Phys. **82**, 578–587 (2002)	__i	__i	__i		__i
24	Administered Radioactivity: *Unde Venimus Quoque Imus,* S. James Adelstein (2000), Health Phys. **80,** 317–324 (2001)	__i	__i	__i		__i
23	Back to Background: Natural Radiation and Radioactivity Exposed, by Naomi H. Harley (1999), Health Phys. **79**, 121–128 (2000)	__i	__i	__i		__i
22	From Chimney Sweeps to Astronauts: Cancer Risks in the Work Place, by Eric J. Hall (1998), Health Phys. **75**, 357–366 (1999)	__i	__i	__i		__i
21	Radionuclides in the Body: Meeting the Challenge, by William J. Bair (1997), Health Phys. **73**, 423–432 (1998)	__i	__i	__i		__i
20	70 Years of Radiation Genetics: Fruit Flies, Mice and Humans, by Seymour Abrahamson (1996), Health Phys. **71**, 624–633 (1997)	__i	__i	__i		__i

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
19	Certainty and Uncertainty in Radiation Research, by Albrecht M. Kellerer (1995), Health Phys. **69**, 446–453 (1996)	__i	__i	__i		__i
18	Mice, Myths and Men, by R.J. Michael Fry (1994)	__d	0	__ j	512	512
17	Science, Radiation Protection and the NCRP, by Warren K. Sinclair (1993)	__d	0	__ j	544	544
16	Dose and Risk in Diagnostic Radiology: How Big? How Little?, by Edward W. Webster (1992)	__d	0	0	1,434	1,434
15	When is a Dose Not a Dose?, by Victor P. Bond (1991)	__d	0	0	752	752
14	Radiation Protection and the Internal Emitter Saga, by J. Newell Stannard (1990)	__d	0	0	354	354
13	Radiobiology and Radiation Protection: The Past Century and Prospects for the Future, by Arthur C. Upton (1989)	__d	0	0	580	580
12	How Safe is Safe Enough?, by Bo Lindell (1988)	__d	0	0	1,010	1,010
11	How to Be Quantitative about Radiation Risk Estimates, by Seymour Jablon (1987)	__d	0	0	1,023	1,023
10	Biological Effects of Non-Ionizing Radiations: Cellular Properties and Interactions, by Herman P. Schwan (1986)	__d	0	0	1,692	1,692
9	Truth (and Beauty) in Radiation Measurement, by John H. Harley (1985)	__d	0	0	765	765
8	Limitation and Assessment in Radiation Protection, by Harald H. Rossi (1984)	__d	0	0	1,530	1,530
7	The Human Environment—Past, Present and Future, by Merril Eisenbud (1983)	__d	0	0	1,034	1,034
6	Ethics, Trade-Offs and Medical Radiation, by Eugene L. Saenger (1982)	__d	0	0	1,251	1,251
5	How Well Can We Assess Genetic Risk? Not Very, by James F. Crow (1981)	__d	0	0	1,404	1,404
4	From "Quantity of Radiation" and "Dose" to "Exposure" and "Absorbed Dose"—An Historical Review, by Harold O. Wyckoff (1980)	__d	0	0	1,852	1,852
3	Radiation Protection—Concepts and Trade Offs, by Hymer L. Friedell (1979)	__d	0	0	2,085	2,085
2	Why be Quantitative about Radiation Risk Estimates? by Sir Edward E. Pochin (1978)	__d	0	__ j	2,338	2,338
1	The Squares of the Natural Numbers in Radiation Protection, by Herbert M. Parker (1977)	__d	0	__ j	1,513	1,513
	Total Lectures Distributed	0	0	0	21,673	21,673

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
NCRP Annual Meeting Proceedings						
37	Changing Regulations and Radiation Guidance: What Does the Future Hold?, Proceedings of the Fifty-First Annual Meeting held March 16–17, 2015. Health Phys. **110**(2), 97–237 (2016)	__i	__i	__i		__i
36	NCRP: Achievements of the Past 50 Years and Addressing the Needs of the Future, Proceedings of the Fiftieth Annual Meeting held March 10–11, 2014. Health Phys. **108**(2), 97–241 (2015)	__i	__i	__i		__i
35	Radiation Dose and the Impacts on Exposed Populations, Proceedings of the Forty-Ninth Annual Meeting held March 11–12, 2013. Health Phys. **106**(2), 145–329 (2014)	__i	__i	__i		__i
34	Emerging Issues in Radiation Protection in Medicine, Emergency Response, and the Nuclear Fuel Cycle, Proceedings of the Forty-Eighth Annual Meeting held March 12–13, 2012. Health Phys. **105**(5), 401–468 (2013)	__i	__i	__i		__i
33	Scientific and Policy Challenges of Particle Radiations in Medical Therapy and Space Missions, Proceedings of the Forty-Seventh Annual Meeting held March 7–8, 2011. Health Phys. **103**(5), 529–684 (2012)	__i	__i	__i		__i
32	Communication of Radiation Benefits and Risks in Decision Making, Proceedings of the Forty-Sixth Annual Meeting held March 8–9, 2010. Health Phys. **101**(5), 497–629 (2011)	__i	__i	__i		__i
31	Future of Nuclear Power Worldwide: Safety, Health and Environment, Proceedings of the Forty-Fifth Annual Meeting held March 2–3, 2009. Health Phys. **100**(1), 2–112 (2011)	__i	__i	__i		__i
30	Low Dose and Low Dose-Rate Radiation Effects and Models, Proceedings of the Forty-Fourth Annual Meeting held April 14–15, 2008. Health Phys. **97**(5), 373–541 (2009)	__i	__i	__i		__i
29	Advances in Radiation Protection in Medicine, Proceedings of the Forty-Third Annual Meeting held April 16–17, 2007. Health Phys. **95**(5), 461–686 (2008)	__i	__i	__i		__i
28	Chernobyl at Twenty, Proceedings of the Forty-Second Annual Meeting held April 3–4, 2006. Health Phys. **93**(5), 345–595 (2007)	__i	__i	__i		__i
27	Managing the Disposition of Low-Activity Radioactive Materials, Proceedings of the Forty-First Annual Meeting held March 30–31, 2005. Health Phys. **91**, 413–536 (2006)	__i	__i	__i	3	3

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
26	Advances in Consequence Management for Radiological Terrorism Events, Proceedings of the Fortieth Annual Meeting held April 14–15, 2004. Health Phys. **89**(5), 415–588 (2005)	__i	__i	__i	1	1
	Compact disk version of Proceedings No. 26	__i	0	0	102	102
25	Radiation Protection at the Beginning of the 21st Century—A Look Forward, Proceedings of the Thirty-Ninth Annual Meeting held April 9–10, 2003. Health Phys. **87**(3), 249–318 (2004)	__i	__i	__i		__i
24	Where the New Biology Meets Epidemiology: Impact on Radiation Risk Estimates, Proceedings of the Thirty-eighth Annual Meeting held April 10–11, 2002. Health Phys. **85**, 1–108 (2003)	__i	__i	__i		__i
23	Fallout from Atmospheric Nuclear Tests—Impact on Science and Society, Proceedings of the Thirty-seventh Annual Meeting held April 4–5, 2001. Health Phys. **82**, 573–748 (2002)	__i	__i	__i		__i
22	Ionizing Radiation Science and Protection in the 21st Century, Proceedings of the Thirty-sixth Annual Meeting held April 5–6, 2000. Health Phys. **80**, 317-402 (2001)	__i	__i	__i		__i
21	Radiation Protection in Medicine: Contemporary Issues, Proceedings of the Thirty-fifth Annual Meeting held April 7–8, 1999 (1999)	__d	0	0	205	205
	Compact disk version of Proceedings No. 21	__d	0	0	82	82
20	Cosmic Radiation Exposure of Airline Crews, Passengers and Astronauts, Proceedings of the Thirty-fourth Annual Meeting held on April 1–2, 1998, Health Phys. **79**, 466–613 (2000)	__i	__i	__i	0	__i
19	The Effects of Pre- and Postconception Exposure to Radiation, Proceedings of the Thirty-third Annual Meeting held on April 2–3, 1997, Teratology **59**, 181–317 (1999)	__i	__i	__i	0	__i
18	Implications of New Data on Radiation Cancer Risk, Proceedings of the Thirty-second Annual Meeting held April 3–4, 1996 (1997)	__d	0	__ j	384	384
17	Environmental Dose Reconstruction and Risk Implications, Proceedings of the Thirty-first Annual Meeting held April 12–13, 1995 (1996)	__d	0	__ j	428	428
16	Extremely-Low-Frequency Electromagnetic Fields: Issues in Biological Effects and Public Health, Proceedings of the Thirtieth Annual Meeting held on April 6–7, 1994 [not published]	__d	0	__ j	0	0
15	Radiation Science and Societal Decision Making, Proceedings of the Twenty-Ninth Annual Meeting held April 7–8, 1993 (1994)	__d	0	__ j	565	565

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
14	Radiation Protection in Medicine, Proceedings of the Twenty-Eighth Annual Meeting held April 1–2, 1992 (1993)	__d	0	__j	847	847
13	Genes, Cancer and Radiation Protection, Proceedings of the Twenty-Seventh Annual Meeting held April 3–4, 1991 (1992)	__d	0	__j	690	690
12	Health and Ecological Implications of Radioactively Contaminated Environments, Proceedings of the Twenty-Sixth Annual Meeting held April 4–5, 1990 (1991)	__d	0	__j	917	917
11	Radiation Protection Today—The NCRP at Sixty Years, Proceedings of the Twenty-Fifth Annual Meeting held April 4–5, 1989 (1990)	__d	0	0	661	661
10	Radon, Proceedings of the Twenty-Fourth Annual Meeting held March 30–31, 1988 (1989)	__d	0	__j	1,454	1,454
9	New Dosimetry at Hiroshima and Nagasaki and Its Implications for Risk Estimates, Proceedings of the Twenty-Third Annual Meeting held April 8–9, 1987 (1989)	__d	0	__j	748	748
8	Nonionizing Electromagnetic Radiations and Ultrasound, Proceedings of the Twenty-Second Annual Meeting held April 2–3, 1986 (1988)	__d	0	__j	1,025	1,025
7	Radioactive Waste, Proceedings of the Twenty-First Annual Meeting held April 3–4, 1985 (1986)	__d	0	__j	1,421	1,421
6	Some Issues Important in Developing Basic Radiation Protection Recommendations, Proceedings of the Twentieth Annual Meeting held April 4–5, 1984 (1985)	__d	0	__j	1,537	1,537
5	Environmental Radioactivity, Proceedings of the Nineteenth Annual Meeting held April 6–7, 1983 (1984)	__d	0	__j	3,976	3,976
4	Radiation Protection and New Medical Diagnostic Approaches, Proceedings of the Eighteenth Annual Meeting held April 6–7, 1982 (1983)	__d	0	__j	1,210	1,210
3	Critical Issues in Setting Radiation Dose Limits, Proceedings of the Seventeenth Annual Meeting held April 8–9, 1981 (1982)	__d	0	__j	1,667	1,667
2	Quantitative Risk in Standards Setting, Proceedings of the Sixteenth Annual Meeting held April 2–3, 1980 (1981)	__d	__e	__j	2,158	2,158
1	Perceptions of Risk, Proceedings of the Fifteenth Annual Meeting held March 14–15, 1979 (1980)	__d	0	__j	1,944	1,944
	Total Proceedings Distributed	0	0	0	22,025	22,025

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
NCRP Commentaries						
26	Guidance on Radiation Dose Limits for the Lens of the Eye (2016)	__d	0	0	0	0
25	Potential for Central Nervous System Effects from Radiation Exposure During Space Activities Phase I: Overview (2016)	__d	27	6	33	33
24	Health Effects of Low Doses of Radiation: Perspectives on Integrating Radiation Biology and Epidemiology (2015)	__d	18	18	78	78
23	Radiation Protection for Space Activities: Supplement to Previous Recommendations (2014)	__d	6	17	60	60
22	Radiological Health Protection Issues Associated With Use of Active Detection Technology Systems for Detection of Radioactive Threat Materials (2011)	__d	2	1	73	73
21	Radiation Protection in the Application of Active Detection Technologies (2011)	__d	0	2	84	84
20	Radiation Protection and Measurement Issues Related to Cargo Scanning With Accelerator-Produced High-Energy X Rays (2007)	__d	0	4	362	362
19	Key Elements of Preparing Emergency Responders for Nuclear and Radiological Terrorism (2005)	__d	1	4	1,329	1,329
18	Biological Effects of Modulated Radiofrequency Fields (2003)	__d	0	1	456	456
17	Pulsed Fast Neutron Analysis System Used in Security Surveillance (2003)	__d	0	0	487	487
16	Screening of Humans for Security Purposes Using Ionizing Radiation Scanning Systems (2003)	__d	1	2	641	641
15	Evaluating the Reliability of Biokinetic and Dosimetric Models and Parameters Used to Assess Individual Doses for Risk Assessment Purposes (1998)	__d	0	0	661	661
14	A Guide for Uncertainty Analysis in Dose and Risk Assessments Related to Environmental Contamination (1996)	__d	1	1	1,666	1,666
13	An Introduction to Efficacy in Diagnostic Radiology and Nuclear Medicine (Justification of Medical Radiation Exposure) (1995)	__d	0	0	1,400	1,400
12	Radiation Exposure and High-Altitude Flight (1995)	__d	0	2	562	562
11	Dose Limits for Individuals Who Receive Exposure from Radionuclide Therapy Patients (1995)	__d	0	2	1,326	1,326
10	Advising the Public about Radiation Emergencies: A Document for Public Comment (1994)	__d	0	0	1,175	1,175

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office[a]	NCRP Publications[b] 2016		Total NCRP Publications[c]	All Sources Combined
			Hardcopy	E-Pub		
9	Considerations Regarding the Unintended Radiation Exposure of the Embryo, Fetus or Nursing Child (1994)	__d	0	1	1,395	1,395
8	Uncertainty in NCRP Screening Models Relating to Atmospheric Transport, Deposition and Uptake by Humans (1993)	__d	2	2	918	918
7	Misadministration of Radioactive Material in Medicine—Scientific Background (1991)	__d	0	0	1,088	1,088
6	Radon Exposure of the U.S. Population—Status of the Problem (1991)	__d	0	0	1,105	1,105
5	Review of the Publication, "Living Without Landfills" (1989)	__d	0	0	3,104	3,104
4	Guidelines for the Release of Waste Water from Nuclear Facilities with Special Reference to the Public Health Significance of the Proposed Release of Treated Waste Waters at Three Mile Island (1987)	__d	1	1	862	862
3	Screening Techniques for Determining Compliance with Environmental Standards—Releases of Radionuclides to the Atmosphere (1986)	__d	0	0	3,603	3,603
2	Preliminary Evaluation of Criteria for the Disposal of Transuranic Contaminated Waste (1982)	__d	0	0	292	292
1	Krypton-85 in the Atmosphere—with Specific Reference to the Public Health Significance of the Proposed Controlled Release at Three Mile Island (1980)	__d	0	0	697	697
	Total Commentaries Distributed	0	59	64	23,457	23,457
NCRP Symposia Proceedings						
3	Acceptability of Risk from Radiation—Application to Human Space Flight, Proceedings of a Symposium held May 29, 1996 (1997)	__d	0	0	655	655
2	Radioactive and Mixed Waste—Risk as a Basis for Waste Classification, Proceedings of a Symposium held November 9, 1994 (1995)	__d	0	0	463	463
1	The Control of Exposure of the Public to Ionizing Radiation in the Event of Accident or Attack, Proceedings of a Symposium held April 27-28, 1981 (1982)	__d	0	0	1,849	1,849
	Total Symposia Proceedings Distributed	0	0	0	2,967	2,967
	Total NCRP Publications Distributed	959,448	563	836	1,027,432	1,986,880

[a]The U.S. Government Printing Office distributed NCRP reports during the period May 16, 1931 through December 31, 1975.
[b]Includes distribution of complimentary copies.
[c]Since the initiation of the NCRP Publication Program in July 1966.
[d]Document distributed only by NCRP Publications (hardcopy and electronic download).
[e]Out of print before December 31, 2016.
[f]This report was not distributed by the U.S. Government Printing Office. The report was originally published by the Section of Nuclear Medicine, Department of Pharmacology, The University of Chicago, Chicago, Illinois and the distribution given here was by that office.
[g]No record of distribution is available.
[h]Out of print prior to initiation of Publication Program in July 1966.
[i]Published and distributed by source indicated.
[j]Not available in softcopy (*i.e.*, PDF, E-Pubs).