

Annual Report

2011

Year in Review





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Charter

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

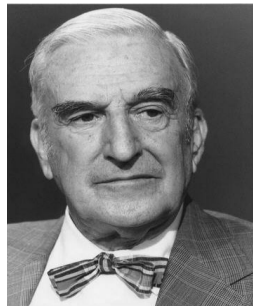
1. Collect, analyze, develop and disseminate in the public interest information and recommendations about (a) protection against radiation and (b) radiation measurements, quantities and units, particularly those concerned with radiation protection.
2. Provide a means by which organizations concerned 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.



Lauriston S. Taylor
1929–1977



Warren K. Sinclair
1977–1991



Charles B. Meinhold
1991–2002



Thomas S. Tenforde
2002–



President's Message

NCRP was scientifically productive in 2011 and completed one report, two commentaries, and the proceedings of the 2010 NCRP Annual Meeting. Significant progress was made on other reports that will be completed in 2012. NCRP publications completed in 2011 are the following.

- Report No. 170: *Second Primary Cancers and Cardiovascular Disease After Radiation Therapy*. Second primary cancers and cardiovascular disease are two of the most important late effects of radiation therapy. Report No. 170 provides a comprehensive assessment of the risk of these effects following radiation therapy, which is especially high among juvenile and adolescent radiation therapy patients. The Report describes complex epidemiologic and dosimetric issues surrounding past, conventional and new radiation therapy modalities, including intensity-modulated radiation therapy and particle-beam therapy.
- Commentary No. 21: *Radiation Protection in the Application of Active Detection Technologies*. With the growing threat of terrorism, concerns about the use of special nuclear material (SNM) in acts of terrorism are high. The U.S. government is actively pursuing efforts to design, develop and support the deployment of active detection technology (ADT) systems for remote detection of SNM in transport vehicles. The Commentary focuses on ADT systems being designed by contractors working with the Defense Threat Reduction Agency and provides guidance to inform the development process with respect to radiation protection issues. The recommendations in Commentary No. 21 are broadly applicable to all ADTs that are planned for use in detecting SNM.
- Commentary No. 22: *Radiological Health Protection Issues Associated With Use of Active Detection Technology Systems for Detection of Radioactive Threat Materials*. The Defense Threat Reduction Agency is sponsoring research into technologies that could detect at standoff distances (100 to 1,000 m) SNM and other radioactive materials that could represent a significant terrorism threat to homeland security. These ADT systems include the use of high-intensity bremsstrahlung and particle radiations, including protons, neutrons and muons to elicit signatures for detecting SNM on distant transport vehicles. Commentary No. 22 describes the potential radiation doses from ADT systems to operating personnel, bystanders, and other individuals in the inspected areas, and the design and operational factors that must be considered in assessing the safety and efficiency of ADT systems.
- Proceedings of the 2010 NCRP Annual Meeting on *Communication of Radiation Benefits and Risks in Decision Making* were also completed in 2011. The Proceedings, along with the 34th Annual Lauriston S. Taylor Lecture by Charles E. Land on *Radiation Protection and Public Policy in an Uncertain World*, were published in *Health Physics* [101(5), 497–629 (2011)]. NCRP extends its appreciation to the Program Committee, led by Paul A. Locke, for organizing the 2010 meeting

on a timely and important topic. Presentations were made on the topics of (1) role of new tools and media as efficient vehicles for risk communication, (2) communication issues and challenges posed by potential acts of nuclear and radiological terrorism and radiation emergencies, (3) communicating benefits and risks of medical applications of radiation for the diagnosis and treatment of disease, and (4) mechanisms and examples of effective communications in decision making related to protection of human health and the environment.

NCRP also continued its program on appropriate applications of computed tomography in emergency medicine. Along with eight cosponsors, including scientific organizations and federal agencies, NCRP held a workshop on September 23–24, 2009 on *Applications of Computed Tomography in Emergency Medicine: Ensuring Appropriate Use*. A summary of the workshop was published in the *Journal of the American College of Radiology* [8, 325–329 (2011)], and has formed the framework for the drafting of a consensus paper on clinical guidelines for appropriate uses of computed tomography in emergency medicine. A team of emergency medicine physicians, radiologists, and medical physicists convened at NCRP on December 14–15, 2010 to draft major sections of the consensus paper, which was completed by NCRP in 2011 for review by all of the cosponsoring organizations. A final version of the paper will be submitted in 2012 for publication in both radiology and emergency medicine journals.

It is expected that 2012 will be another productive year for NCRP with the completion of several important publications. Reports that are in an advanced stage of preparation for release on the website (<http://NCRPpublications.org>) are:

- Uncertainties in the Estimation of Radiation Risks and Probability of Disease Causation;
- Investigation of Radiological Incidents;
- Diagnostic Reference Levels in Medical and Dental Imaging: Recommendations for Applications in the United States; and
- Adverse Effects of Radiation on the Gamete, Embryo, Fetus, and Nursing Infant.

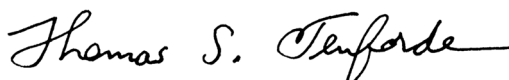
Proceedings of the 2011 NCRP Annual Meeting on *Scientific and Policy Challenges of Particle Radiations in Medical Therapy and Space Missions* will also be prepared in 2012.

The 2012 Annual Meeting on *Emerging Issues in Radiation Protection in Medicine, Emergency Response, and the Nuclear Fuel Cycle* has been organized by a Program Committee chaired by Richard E. Toohey, and the final agenda can be viewed at the NCRP website (<http://NCRPonline.org>). Primary topics of discussion will include radiation protection of medical patients and implications of the Fukushima Daiichi nuclear reactor accident for radiation protection.

In 2011, NCRP continued planning for an education and training program, including internet-based and classroom course formats. Several recent and forthcoming NCRP reports are of broad interest (*e.g.*, in areas related to medical applications of radiation and countermeasures to radiological or nuclear acts of terrorism), and could form the basis for training courses. The decision has been made by the NCRP Board of Directors to move forward in launching this program in 2012, working in collaboration with other organizations that have extensive experience in preparing and promoting education and training programs.

NCRP remained in a stable financial position in 2011, even though the income from grants, contracts, contributions, investments, and sale of publications was less than the expenses by \$191K. The majority of this difference (about 64 %) was due to unrealized loss on investments and post-retirement benefit increases.

As I approach the end of my tenth year as President of NCRP, I have enjoyed continuing to work with members of the Council, NCRP's scientific committees, staff, and collaborators in meeting many radiation protection and measurement challenges to be addressed by NCRP. I will be retiring as the NCRP President at the Annual Business Meeting on March 13, 2012. The Nominating Committee has nominated Dr. John D. Boice, Jr. as the Council's fifth President. Dr. Boice is an excellent scientist and internationally prominent epidemiologist, and I am confident that he will serve NCRP well.

A handwritten signature in black ink, reading 'Thomas S. Tenforde'. The signature is written in a cursive, flowing style.

Thomas S. Tenforde
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 2011 there were 18 vacancies; seven new members were elected and 11 members were re-elected. The seven new members were:

Norman C. Fost	Sara Rockwell
Cynthia G. Jones	Michael M. Weil
Jonathan M. Links	Gary H. Zeman
David J. Pawel	

2011 Council Membership

E. Stephen Amis, Jr.	Montefiore Medical Center	2007–2013
Sally A. Amundson	Columbia University Medical Center	2010–2016
Kimberly E. Applegate	Emory University School of Medicine	2007–2013
Benjamin R. Archer	Baylor College of Medicine	2006–2012
Stephen Balter	Columbia-Presbyterian Medical Center	2007–2013
Steven M. Becker	University of Alabama at Birmingham	2011–2017
Joel S. Bedford	Colorado State University	2010–2016
Mythreyi Bhargavan	American College of Radiology	2009–2015
Eleanor A. Blakely	Lawrence Berkeley National Laboratory	2006–2012
William F. Blakely	Armed Forces Radiobiology Research Institute	2009–2015
Wesley E. Bolch	University of Florida	2011–2017

Thomas B. Borak	Colorado State University	2007–2013
Leslie A. Braby	Texas A&M University	2007–2013
James A. Brink	Yale University School of Medicine	2011–2017
Brooke R. Buddemeier	Lawrence Livermore National Laboratory	2009–2015
Jerrold T. Bushberg	University of California, Davis	2008–2014
John F. Cardella	BayState Health System	2008–2014
Charles E. Chambers	Penn State Hershey Medical Center	2007–2013
Polly Y. Chang	SRI International	2011–2017
S.Y. Chen	Argonne National Laboratory	2011–2017
Lawrence L. Chi	General Electric Hitachi Nuclear Energy Americas	2010–2016
Mary E. Clark	U.S. Environmental Protection Agency	2008–2014
Michael L. Corradini	University of Wisconsin, Madison	2010–2016
Allen G. Croff	Retired	2010–2016
Paul M. DeLuca	University of Wisconsin Medical School	2008–2014
Christine A. Donahue	Energy Solutions	2009–2015
Stephen A. Feig	University of California Medical Center, Irvine	2006–2012
Alan J. Fischman	Massachusetts General Hospital	2009–2015
Patricia A. Fleming	Saint Mary’s College, Notre Dame	2009–2015
Norman C. Fost	University of Wisconsin – Madison	2011–2017
John R. Frazier	Independent Consultant	2008–2014
Donald P. Frush	Duke University Medical Center	2010–2016
Ronald E. Goans	MJW Corporation	2007–2013
Robert L. Goldberg	University of California, San Francisco	2006–2012
Milton J. Guiberteau	Greater Houston Radiology Associates	2010–2016
Raymond A. Guilmette	Lovelace Respiratory Research Institute	2009–2015
Roger W. Harms	Mayo Clinic	2009–2015
Martin Hauer-Jensen	University of Arkansas for Medical Sciences	2010–2016
Kathryn D. Held	Massachusetts General Hospital	2006–2012
Roger W. Howell	University of Medicine and Dentistry of New Jersey	2009–2015
Hank C. Jenkins-Smith	University of Oklahoma	2010–2016
Cynthia G. Jones	U.S. Nuclear Regulatory Commission	2011–2017
Timothy J. Jorgensen	Georgetown University Medical Center	2007–2013
Ann R. Kennedy	University of Pennsylvania School of Medicine	2007–2013
William E. Kennedy, Jr.	Dade Moeller & Associates, Inc.	2010–2016
David C. Kocher	SENES Oak Ridge, Inc.	2011–2017
Ritsuko Komaki	MD Anderson Cancer Center	2006–2012
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	2010–2016
Edwin M. Leidholdt, Jr.	U.S. Department of Veterans Affairs	2006–2012

Martha S. Linet	National Cancer Institute	2010–2016
Jonathan M. Links	Johns Hopkins University Bloomberg School of Public Health	2011–2017
Jill A. Lipoti	New Jersey Department of Environmental Protection	2007–2013
Paul A. Locke	Johns Hopkins University	2010–2016
Jay H. Lubin	National Cancer Institute	2006–2012
Debra McBaugh	Washington State Department of Health	2006–2012
Ruth E. McBurney	Conference of Radiation Control Program Directors, Inc.	2007–2013
Charles W. Miller	Centers for Disease Control and Prevention	2006–2012
Donald L. Miller	Food and Drug Administration	2006–2012
William H. Miller	University of Missouri, Columbia	2011–2017
William F. Morgan	Pacific Northwest National Laboratory	2008–2014
Stephen V. Musolino	Brookhaven National Laboratory	2008–2014
David S. Myers	Retired	2007–2013
Bruce A. Napier	Pacific Northwest National Laboratory	2008–2014
Gregory A. Nelson	Loma Linda University Medical Center	2006–2012
Andrea K. Ng	Harvard Medical School, Brigham & Women’s Hospital	2009–2015
Carl J. Paperiello	Independent Consultant	2008–2014
David J. Pawel	U.S. Environmental Protection Agency	2011–2017
Terry C. Pellmar	Armed Forces Radiobiology Research Institute	2008–2014
R. Julian Preston	U.S. Environmental Protection Agency	2009–2015
Kathryn H. Pryor	Pacific Northwest National Laboratory	2010–2016
Jerome S. Puskin	U.S. Environmental Protection Agency	2006–2012
Sara Rockwell	Yale School of Medicine	2011–2017
Adela Salame-Alfie	New York State Department of Health	2009–2015
Beth A. Schueler	Mayo Clinic	2009–2015
J. Anthony Seibert	University of California Davis Medical Center	2008–2014
Stephen M. Seltzer	National Institute of Standards and Technology	2010–2016
Edward A. Sickles	University of California Medical Center	2007–2013
Steven L. Simon	National Cancer Institute	2010–2016
Christopher G. Soares	National Institute of Standards and Technology	2011–2017
Michael G. Stabin	Vanderbilt University	2010–2016
Daniel J. Strom	Pacific Northwest National Laboratory	2008–2014
Tammy P. Taylor	Los Alamos National Laboratory	2010–2016
Thomas S. Tenforde	National Council on Radiation Protection and Measurements	2008–2014
Julie K. Timins	Diagnostic Radiology	2010–2016
Richard E. Toohey	Oak Ridge Associated Universities	2006–2012
Elizabeth L. Travis	MD Anderson Cancer Center	2009–2015
Fong Y. Tsai	University of California Medical Center, Irvine	2006–2012

Louis K. Wagner	University of Texas-Houston Medical School	2010–2016
Michael M. Weil	Colorado State University	2011–2017
Chris G. Whipple	Environ	2007–2013
Robert C. Whitcomb, Jr.	Centers for Disease Control and Prevention	2008–2014
Stuart C. White	University of California, Los Angeles	2010–2016
Gayle E. Woloschak	Northwestern University	2009–2015
Shiao Y. Woo	University of Louisville	2011–2017
Andrew J. Wyrobek	Lawrence Livermore National Laboratory	2006–2012
X. George Xu	Rensselaer Polytechnic Institute	2008–2014
R. Craig Yoder	Landauer, Inc.	2008–2014
Gary H. Zeman	Argonne National Laboratory	2011–2017

Board of Directors

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Paul M. DeLuca	Debra McBaugh	Julie E.K. Timins
Raymond A. Guilmette	William F. Morgan	Richard E. Toohey
	David S. Myers	

*Newly elected to the Board of Directors on March 8, 2011.

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 Fred A. Mettler, Jr.
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 Marvin Rosenstein
 Lawrence N. Rothenberg
 Henry D. Royal
 Michael T. Ryan
 William J. Schull
 Roy E. Shore
 Paul Slovic
 John E. Till
 Lawrence W. Townsend
 Robert L. Ullrich
 Arthur C. Upton
 Richard J. Vetter
 F. Ward Whicker
 Susan D. Wiltshire
 Marvin C. Ziskin

†Deceased during 2011.

*Elected to Distinguished Emeritus Membership March 8, 2011.

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	H. Keith Florig	John E. Moulder
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John W. Baum	Barry B. Goldberg	Frank L. Parker
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Merrill A. Bender	Douglas Grahn	Ronald C. Petersen
B. Gordon Blaylock	Andrew J. Grosovsky	Adam Recht*
Frederick J. Bonte	Ellis M. Hall	William C. Reinig
Harold S. Boyne	Robert J. Hasterlik	Allan C.B. Richardson
John W. Brand	John M. Heslep	Robert Robbins
David J. Brenner	John W. Hirshfeld, Jr.	Lester Rogers
A. Bertrand Brill	David G. Hoel	Robert E. Rowland
Thomas F. Budinger	George B. Hutchison	Jonathan M. Samet
Patricia A. Buffler	Marylou Ingram	Keith J. Schiager
William W. Burr, Jr.	Seymour Jablon	Robert A. Schlenker
Stephanie K. Carlson	A. Everette James, Jr.	Thomas M. Seed
Paul L. Carson	John R. Johnson	Raymond Seltser
Donald K. Chadwick	James G. Kereiakes	Ferdinand J. Shore
Chung-Kwang Chou	H. William Koch	Kenneth W. Skrable
Kelly L. Classic	Harold L. Kundel	David H. Sliney
Stephen F. Cleary	Richard W. Leggett	James H. Sterner
James E. Cleaver	George R. Leopold	Louise C. Strong
Fred T. Cross	Howard L. Liber	Herman D. Suit
Francis A. Cucinotta	James C. Lin*	Richard A. Tell
Stanley B. Curtis	Thomas A. Lincoln	Joop W. Thiessen
Carter Denniston	David I. Livermore	Ralph H. Thomas
John F. Dicello	Ray D. Lloyd	Lois B. Travis
Richard L. Doan	Richard A. Luben	John C. Villforth
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Charles M. Eisenhauer	Claire M. Mays	J. Frank Wilson
Joe A. Elder	Cynthia H. McCollough	H. Rodney Withers
Edward R. Epp	Mortimer L. Mendelsohn	Marco A. Zaider*
Donald C. Fleckenstein	Jack Miller	Pat B. Zanzonico
	William A. Mills	

†Deceased during 2011.

*Elected to Consociate Membership March 8, 2011.

Administrative Committees

Budget & Finance Committee (appointed by the Board of Directors, March 8, 2011)

Richard E. Toohey, *Chairman*

John R. Frazier
Ruth E. McBurney

Terry C. Pellmar
R. Craig Yoder

Nominating Committee (appointed by the Board of Directors, March 8, 2011)

Amy Kronenberg, *Chairman*

Jerrold T. Bushberg
Christine A. Donahue

Donald P. Frush
Chris G. Whipple

Program Committee for 2012 Annual Meeting

(appointed by the Board of Directors, March 8, 2011)

Richard E. Toohey, *Chairman*

Steven M. Becker
S.Y. Chen
Christopher H. Clement
Michael Corradini
Paul A. Locke

Debra McBaugh
Julie E.K. Timins
Richard J. Vetter
Kenneth R. Kase, *Advisor*

Scientific and Administrative Staff

David A. Schauer	Executive Director
Laura J. Atwell	Office Manager, ICRU Assistant Executive Secretary
R. Thomas Bell	Technical Staff Consultant
James F. Berg	Accounting Consultant
Bruce B. Boecker	Technical Staff Consultant
Charles C. Church	Technical Staff Consultant
Brian Dodd	Technical Staff Consultant
John R. Frazier	Technical Staff Consultant
Steven R. Frey	Technical Staff Consultant
Joel E. Gray	Technical Staff Consultant
Michael P. Grissom	Technical Staff Consultant
Kenneth L. Groves	Technical Staff Consultant
Luvenia J. Hawkins	Senior Text Processor
Morton W. Miller	Technical Staff Consultant
Cindy L. O'Brien	Managing Editor
Beverly A. Ottman	Receptionist, Text Processor, ISR Support Staff
Terry C. Pellmar	Technical Staff Consultant
Harold T. Peterson, Jr.	Technical Staff Consultant
Marvin Rosenstein	Technical Staff Consultant
Bonnie G. Walker	Assistant Managing Editor
E. Ivan White	Technical Staff Consultant
Myrna A. Young	Financial Records Manager

Program Area Committees and Advisory Panels

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 six program area committees and two advisory panels. They are:

Program Area Committees

Basic Criteria, Epidemiology, Radiobiology, and Risk	Kathryn D. Held
Operational Radiation Safety	David S. Myers
Nuclear and Radiological Security and Safety	John W. Poston, Sr.
Radiation Protection in Medicine	James A. Brink
Environmental Radiation and Radioactive Waste Issues	S.Y. Chen
Radiation Measurements and Dosimetry	Raymond A. Guilmette

Advisory Panels

Public Policy
Nonionizing Radiation

Vice Presidents

Each scientific program area committee is chaired by an NCRP 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

Basic Criteria, Epidemiology, Radiobiology, and Risk

Vice President, William F. Morgan

Key Functions of Program Area Committee (PAC) 1

- Evaluate and approve all NCRP 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

Kathryn D. Held, *Vice President*
Sally A. Amundson
Joel S. Bedford
Bruce B. Boecker
Antone L. Brooks
Kenneth R. Kase
Ann R. Kennedy
Amy Kronenberg
Charles E. Land
William F. Morgan
Gregory A. Nelson
Roy E. Shore
Julie E.K. Timins
Susan D. Wiltshire
Gayle E. Woloschak
Warren K. Sinclair, *Advisor*
Thomas S. Tenforde, *NCRP Contact*

Authorized but Unfunded Activities

- Lung cancer risks from inhaled radionuclides

Active Scientific Committees Under PAC 1

SC 1-15 Radiation Protection and Science Goals for Short-Term Lunar Missions

Status: Pending supplemental funding

Thomas S. Tenforde, *Chairman*

Jay Apt

Stephen A. Benjamin

Ethel S. Gilbert

Michael J. Golightly

Richard P. Hill

George E. Iliakis

Karen E. Jenni

Stephen W.S. McKeever

John E. Moulder

Peggy L. Olive

C. Griffin Trotter

Kathryn D. Held, *Advisor*

Richard A. Mewaldt, *Advisor*

J. Leslie Redpath, *Advisor*

R.J. Michael Fry, *Consultant*

Amy Kronenberg, *Consultant*

Gregory A. Nelson, *Consultant*

Kenneth Souza, *Consultant*

Harold T. Peterson, Jr., *Technical Staff Consultant*

SC 1-16 Uncertainties in the Estimation of Radiation Risks and Probability of Disease Causation

Status: Revising after Council review

R. Julian Preston, *Chairman*

John D. Boice, Jr.

A. Bertrand Brill

Ranajit Chakraborty

Rory Conolly

Richard W. Hornung

Roy E. Shore

Gayle E. Woloschak

F. Owen Hoffman, *Advisor*

Charles E. Land, *Advisor*

Morton W. Miller, *Technical Staff Consultant*

SC 1-20 Biological Effectiveness of Photons as a Function of Energy

Status: Early draft stage

Steven L. Simon, *Chairman*

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*

Completed in 2011

NCRP Commentary No. 21, *Radiation Protection in the Application of Active Detection Technologies*, was issued in 2011. This Commentary was drafted by Scientific Committee 1-18 under the chairmanship of Kenneth L. Miller and vice-chairmanship of Debbie B. Gilley.

NCRP Commentary No. 22, *Radiological Health Protection Issues Associated With Use of Active Detection Technology Systems for Detection of Radioactive Threat Materials*, was issued in 2011. This Commentary was drafted by Scientific Committee 1-19 under the chairmanship of John F. Ahearne.

NCRP Report No. 170, *Second Primary Cancers and Cardiovascular Disease After Radiation Therapy*, was completed in 2011. This Report was drafted by Scientific Committee 1-17 with Lois B. Travis as chairman and John D. Boice, Jr. as vice chairman.

Operational Radiation Safety

Vice President, David S. Myers

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

David S. Myers, *Vice President*
Edgar D. Bailey
Carol D. Berger
Mary L. Birch
John R. Frazier
Eric M. Goldin
Kenneth L. Miller
John W. Poston, Sr.
Kathryn H. Pryor
Joshua Walkowicz
James G. Yusko
Thomas S. Tenforde, *NCRP Contact*

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

Active Scientific Committees Under PAC 2

SC 2-5 Investigation of Radiological Incidents

Status: Preparing for Council review

Davis S. Myers, *Chairman*

Edgar D. Bailey

Carol D. Berger

Mary L. Birch

John R. Frazier

Eric M. Goldin

Kenneth L. Miller

John W. Poston, Sr.

Kathryn H. Pryor

Joshua Walkowicz

James G. Yusko

Thomas S. Tenforde, *NCRP Contact*

Nuclear and Radiological Security and Safety

Vice President, John W. Poston, Sr.

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 a nuclear or radiological explosions to 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
- Develop operational strategies and optimization procedures for early, intermediate and late-phase responses to a nuclear or radiological terrorism incident

Members of PAC 3

John W. Poston, Jr., *Vice President*
 Debra McBaugh, *Vice Chair*
 Steven M. Becker
 Brooke R. Buddemeier
 Stephen V. Musolino
 Terry C. Pellmar
 Tammy P. Taylor
 Leslie A. Braby, *Liaison*
 Jerrold T. Bushberg, *Liaison*
 Jill A. Lipoti, *Liaison*
 Julie E.K. Timins, *Liaison*
 Thomas S. Tenforde, *NCRP Contact*

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*

E. Stephen Amis

Jerrold T. Bushberg

John F. Cardella

Charles E. Chambers

Donald P. Frush

Ronald E. Goans

Linda A. Kroger

Edwin M. Leidholdt

Fred A. Mettler, Jr.

John H. O'Connell

Theodore L. Phillips

J. Anthony Seibert

Steven G. Sutlief

Stuart C. White

Shiao Y. Woo

Thomas S. Tenforde, *NCRP Contact*

Authorized but Unfunded Activities

- Medical evaluation of workers
- Radiological protection standards and ethical issues in studies involving radiation exposure of human research subjects
- Revision of NCRP Report No. 102 on *Medical X-Rays, Electron Beam and Gamma-Ray Protection for Energies Up to 50 MeV* (1989)

Active Scientific Committees Under PAC 4

SC 4-3 **Diagnostic Reference Levels in Medical Imaging: Recommendations for Application in the United States**

Status: Revising after Council review

James A. Brink, *Chairman*

John M. Boone

Kate A. Feinstein

Jeffrey M. Michalski

Robert J. Pizzutiello

David C. Spelic

Stuart C. White

Judy Yee

Stephen Balter, *Consultant*

Jerrold T. Bushberg, *Consultant*

James Duncan, *Consultant*

Donald L. Miller, *Consultant*

Joel E. Gray, *Technical Staff Consultant*

SC 4-4 **Risks of Ionizing Radiation to the Developing Embryo, Fetus and Nursing Infant**

Status: Preparing for Council review

Robert L. Brent, *Chairman*

Donald P. Frush

Robert O. Gorson

Roger W. Harms

Linda A. Kroger

Martha S. Linet

Andrew D. Maidment

John J. Mulvihill

Shiao Y. Woo

Jerrold T. Bushberg, *Consultant*

Joseph J. Morissey, *Consultant (deceased)*

Susan D. Wiltshire, *Consultant*

Marvin C. Ziskin, *Consultant*

Brian Dodd, *Technical Staff Consultant (2008–2010)*

Marvin Rosenstein, *Technical Staff Consultant*

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*
Mary E. Clark
Thomas Hinton
E. Vincent Holahan
Martin J. Letourneau
Jill A. Lipoti
Ruth E. McBurney
Bruce A. Napier
Carl J. Paperiello
Frank L. Parker
Andrew Wallo, III
Chris G. Whipple
Thomas S. Tenforde, *NCRP Contact*

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

Active Scientific Committees Under PAC 5

SC 5-1 Approach to Optimizing Decision Making for Late-Phase Recovery from Nuclear or Radiological Terrorism Incidents

Status: Early draft stage

S.Y. Chen, *Chairman*

Daniel J. Barnett

Brooke R. Buddemeier

Vincent T. Covello

Katherine A. Kiel

Jill A. Lipoti

Debra McBaugh

Andrew Wallo, III

Jonathan D. Edwards, *Advisor*

Helen A. Grogan, *Advisor*

Anne F. Nisbet, *Advisor*

David J. Allard, *Advisor*

John D. Boice, Jr., *Consultant*

John J. Cardarelli, *Consultant*

Michael A. Noska, *Consultant*

John A. MacKinney, *Consultant*

Steven R. Frey, *Technical Staff Consultant*

Radiation Measurements and Dosimetry

Vice President, Raymond A. Guilmette

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

Raymond A. Guilmette, *Vice President*
Harold L. Beck
William F. Blakely
Wesley E. Bolch
Leslie A. Braby
Paul M. DeLuca
John F. Dicello
Keith F. Eckerman
Shawna Eisele
Richard T. Kouzes
Margaret McMahn-Norris
David A. Schauer
Steven L. Simon
Christopher G. Soares
Jeffrey J. Whicker
David A. Schauer, *NCRP Contact*

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 58, A Handbook of Radioactivity Measurements
- Wound model dose coefficients

Public Policy

Key Functions of Public Policy Panel

- Identify policy implications of NCRP publications
- Suggest members or serve as members of new NCRP scientific committees whose topics relate to public policy
- Provide advice and wording on public policy issues when needed for NCRP reports
- Ensure that NCRP communications make it clear that NCRP's publications provide scientific information and recommendations to assist policy makers, but that NCRP does not participate in policy decisions

Members of Advisory Panel

John F. Ahearne
Steven M. Becker
Mary E. Clark
David C. Kocher
Jill A. Lipoti
Paul A. Locke
Charles W. Miller
Paul Slovic
Chris G. Whipple
Susan D. Wiltshire
Thomas S. Tenforde, *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
James E. Cleaver
Arthur W. Guy
David G. Hoel
James C. Lin
David H. Sliney
Jan A.J. Stolwijk
Richard A. Tell
Marvin C. Ziskin
Thomas S. Tenforde, *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 2011 are:

Organization	Contact Person
American Academy for Dermatology	Karen Collishaw, Robert O. Gorson
American Academy of Environmental Engineers	William C. Anderson
American Academy of Health Physics	Howard W. Dickson
American Academy of Orthopaedic Surgeons	Karen L. Hackett
American Association of Physicists in Medicine	Lynne Fairbent, Angela R. Keyser
American Brachytherapy Society	Rick Guggolz, Mark J. Rivard
American College of Cardiology	Rebecca Kelly Gretchen Wyatt
American College of Medical Physics	Lawrence N. Rothenberg
American College of Nuclear Physicians	Bennett Greenspan, Virginia Pappas
American College of Occupational and Environmental Medicine	Joel R. Bender, Thomas S. Ely
American College of Radiology	Harvey L. Neiman
American Conference of Governmental Industrial Hygienists	James Price

American Dental Association	Kathleen O'Laughlin
American Industrial Hygiene Association	O. Gordon Banks, Irene Patrek
American Institute of Ultrasound in Medicine	Carmine M. Valente, Marvin C. Ziskin
American Medical Association	Barry Dickinson, James Lyznicki
American Nuclear Society	Bernard L. Cohen, Shawn Coyne-Naubett, Patricia Schroeder
American Pharmaceutical Association	Anne Burns
American Podiatric Medical Association	James Christina, Glenn B. Gastwirth
American Public Health Association	Georges C. Benjamin
American Radium Society	Ritsuko Komaki
American Roentgen Ray Society	James A. Brink
American Society for Radiation Oncology	Laura Thevenot
American Society of Emergency Radiology	Stephen R. Baker
American Society of Health-System Pharmacists	Henri Manasse, Jr.
American Society of Nuclear Cardiology	Beth Hodge
American Society of Radiologic Technologists	F. Lynn May, Greg Morrison
American Thyroid Association	Barbara Smith
Association of Educators in Imaging and Radiological Sciences	Valerie Christensen
Association of University Radiologists	Josette Szalko
Bioelectromagnetics Society	Stefan Engstrom, Gloria Parsley
Campus Radiation Safety Officers	Ninni Jacob
College of American Pathologists	Myron Pollycove, Lee Van Breman
Conference of Radiation Control Program Directors, Inc.	David Allard, Ruth McBurney
Council on Radionuclides and Radiopharmaceuticals	Henry Kramer, Leonard R. Smith
Defense Threat Reduction Agency	Paul K. Blake
Electric Power Research Institute	Kurt E. Yeager



Federal Aviation Administration	Wallace Friedberg, Frederick Tilton
Federal Communications Commission	Robert F. Cleveland, Jr.
Federal Emergency Management Agency	Vanessa Quinn
Genetics Society of America	Seymour Abrahamson
Health Physics Society	President, Richard Burk
Institute of Electrical and Electronics Engineers, Inc.	Ronald C. Petersen, Mary Ward-Callan
Institute of Nuclear Power Operations	Jeff Place
International Brotherhood of Electrical Workers	William F. Paul
International Society of Exposure Science	Tina Bahadori
National Aeronautics and Space Administration	NASA Administrator
National Association of Environmental Professionals	Clay E. Easterly
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry	Sam Keith
National Electrical Manufacturers Association	Stephen Vastagh
National Institute for Occupational Safety and Health	William G. Lotz
National Institute of Standards and Technology	David Gilliam, James Turner
Nuclear Energy Institute	Ralph Andersen
Office of Science and Technology	John Holdren
Paper, Allied-Industrial, Chemical and Energy Workers International Union	Mark Griffon, Herman Potter
Product Stewardship Institute	Scott Cassel
Radiation Research Society	Martin Brown
Radiological Society of North America	Mark Watson
Society for Cardiovascular Angiography and Interventions	Charles Chambers, Wayne Powell, Bonnie H. Weiner
Society for Pediatric Radiology	Marilyn J. Goske
Society for Risk Analysis	Robin Cantor
Society of Cardiovascular Computed Tomography	President, Carrie Kovar
Society of Chairmen of Academic Radiology Departments	Lise Swanson
Society of Interventional Radiology	Stephen Balter, Debbie Katsarelis

Society of Nuclear Medicine	Fred Fahey, Virginia Pappas
Society of Radiologists in Ultrasound	Susan Roberts
Society of Skeletal Radiology	David Rubin
U.S. Air Force	Ramachandra K. Bhat
U.S. Army	Surgeon General U.S. Army, Robert Eng
U.S. Coast Guard	Michael Adess
U.S. Department of Energy	Secretary of DOE
U.S. Department of Housing and Urban Development	Secretary of HUD
U.S. Department of Labor	Secretary of DOL
U.S. Department of Transportation	Richard W. Boyle
U.S. Environmental Protection Agency	EPA Administrator, Michael Flynn
U.S. Navy	Chairman, Navy Radiation Safety Committee
U.S. Nuclear Regulatory Commission	NRC Chairman, Casper Sun
U.S. Public Health Service	Petro Shandruk
Utility Workers Union of America	John M. Walsh, Jr.

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 2011 are:

Organization	Contact Person
Australian Radiation Laboratory	Keith H. Lokan
Bundesamt fur Strahlenschutz (Germany) (Federal Office for Radiation Protection)	Wolfram Konig
Canadian Association of Medical Radiation Technologists	Charles A. Shields
Canadian Nuclear Safety Commission	J.K. Pereira
Central Laboratory for Radiological Protection (Poland)	Slawomir Sterlinski
China Institute for Radiation Protection	Huating Yang
Commissariat a l'Energie Atomique (France)	Jean-Francois Lecomte
Commonwealth Scientific Instrumentation Research Organization (Australia)	Stan Barnett
European Commission	Hans Forsstrom
Heads of the European Radiological Protection Competent Authorities	Olvido Guzman
Health Council of the Netherlands	A. Wijbenga
Health Protection Agency	John Cooper
International Commission on Non-Ionizing Radiation Protection	Paolo Vecchia
International Commission on Radiation Units and Measurements	Hans G. Menzel
International Commission on Radiological Protection	Claire Cousins
International Radiation Protection Association	Kenneth R. Kase
Japan Radiation Council	Yasuhito Sasaki

Korea Institute of Nuclear Safety

Nuclear Safety Commission of Japan

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

Kwang Sik Choi

Atsuyki Suzuki

Anatoly F. Tsyb

D. van As

Edgar Hux

Zhanat Carr

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 2010 are:

Organization

3M
Global Dosimetry Solutions
Landauer, Inc.
Nuclear Energy Institute

Contact Person

Frederick Entwistle
Sander Perle
R. Craig Yoder
Ralph L. Andersen

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 (100), Distinguished Emeritus Members (64), 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 statements, commentaries, and presidential reports. Statements are brief documents (usually four or fewer pages) 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. 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. 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
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: <i>Unde Venimus Quoque Imus</i>	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 on 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

2011 Lauriston S. Taylor Lecture

The Thirty-Fifth Lauriston S. Taylor Lecture presented by Eleanor A. Blakely, *What Makes Particle Radiation so Effective?*, will be published in *Health Physics*.

Annual Meetings

Year	Topic
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

2011 Annual Meeting

The Forty-Seventh Annual Meeting of NCRP was held March 7–8, 2011 at the Hyatt Regency Bethesda in Bethesda, Maryland. The topic of the meeting was *Scientific and Policy Challenges of Particle Radiations in Medical Therapy and Space Missions*. The sessions and presentations were as follows:

Eighth Annual Warren K. Sinclair Keynote Address

Heavy Ions in Therapy and Space: Benefits and Risks, Marco Durante

Tutorial on Charged Particles in Medicine and Space

Physical Interactions of Charged Particles, Cary Zeitlin
DNA and Cellular Effects of Charged Particles, Maria Antonella Tabocchini
Clinical Results of Particle Therapy, Stephanie E. Combs
Space Radiation Protection Issues, Amy Kronenberg

Carcinogenesis

The *How* and *Why* of Radiation Carcinogenesis: From Particles to Gene and the Inflammatory Signaling Cascade, Tom K. Hei
Animal Studies of Charged Particle-Induced Carcinogenesis, Michael M. Weil
Risk of Second Tumors After Proton Radiation: A Discussion of the Hypotheses and Clinical Data, Torunn I. Yock

Normal Tissue Damage

A Lot to a Little or a Little to a Lot: Insights from Studies on the Rat Spinal Cord, Parotid Gland, and Lung, Peter van Luijk
Cardiovascular Effects of Charged Particle Irradiation, Mark P. Little
Normal Tissue Complications from Proton Therapy, Anita Mahajan

NASCA Report 2: Longitudinal Study of Relationship of Exposure to Space Radiation and Risk of Lens Opacity, Leo T. Chylack, Jr., William H. Tung, Francis A. Cucinotta, Alan H. Feivesson, Dale S. Hardy, Leif E. Peterson, Lisa J. Marak, and Mary L. Wear

Modeling

Track Structure Simulations for Charged Particles, Michael Dingfelder

Molecular Basis of Biophysical Modeling: Damage Complexity, Peter O'Neill

Biophysical Modeling for Particle Therapy, Michael Scholz

Thirty-Fifth Lauriston S. Taylor Lecture on Radiation Protection and Measurements

What Makes Particle Radiation So Effective?, Eleanor A. Blakely

Individual Susceptibility

Defining Molecular and Cellular Responses After Low and High Linear Energy Transfer

Radiations to Develop Biomarkers of Radiation Risk or Therapeutic Outcome That Can be Personalized, Michael D. Story, K. Kian Ang, William Brock, Kevin Coombes, Jing Wang, John Yorby, Lianghao Ding, John Minna, and Seongmi Park

Genetic Susceptibility Relevant to Space Travel, Joel S. Bedford

Transport Codes and Shielding: Practical Radiation Protection

Description of Transport Codes for Space Radiation Shielding, Myung-Hee Y. Kim, Francis A. Cucinotta, and John W. Wilson

Radiation Protection Calculations for Patients and Staff, Wayne D. Newhauser

Review of Nuclear Physics Experimental Data for Space Radiation, John W. Norbury and Jack Miller

Individualizing Particle or Photon Radiation Therapy for Cancer, Soren M. Bentzen

Risk Assessment Modeling for Decision Making in Operations and Policy

Biological-Based Risk Assessment for Space Exploration, Francis A. Cucinotta

Assessment of the Risk for Developing a Second Malignancy from Scattered and Secondary Radiation in Radiation Therapy, Harald Paganetti

Future Vision

NCI Support for Particle Therapy: Past, Present, Future, James Deye

Report on Accelerators for America's Future Workshop: Medicine and Biology, Jose R. Alonso

National Aeronautics and Space Administration's Needs for Research in Charged Particles, Dennis J. Grounds

ENLIGHT: European Network for Light Ion Hadron Therapy, Manjit Dosanjh

Summary: Achievements, Critical Issues, and Thoughts on the Future, Kathryn D. Held

Serving on the Program Committee for the 2011 Annual Meeting were: Kathryn D. Held, *Chairman*; Eleanor A. Blakely, Jerrold T. Bushberg, Stephanie E. Combs, Francis A. Cucinotta, Marco Durante, Joseph R. Dynlacht, Ritsuko U. Komaki, Amy Kronenberg, Gregory A. Nelson, Wayne D. Newhauser, John W. Norbury, Harald Paganetti, and Maria Antonella Tabocchini. The proceedings of the 2011 Annual Meeting will be published in *Health Physics*.

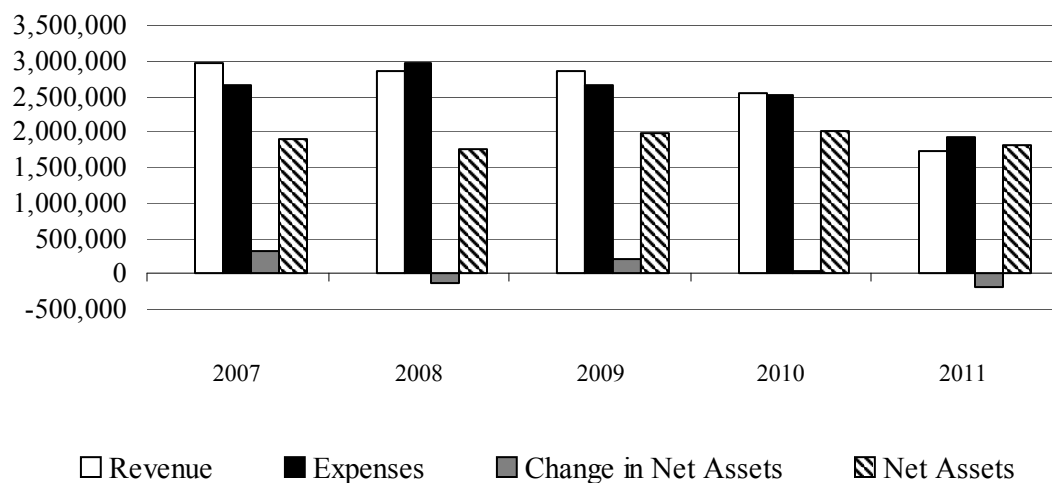
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Financial Summary

The table and bar graph presented below exhibit NCRP’s year-end financial data for 2011 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
2007	2,955,060	2,647,516	307,544	1,885,120
2008	2,856,006	2,975,790	(119,784)	1,765,336
2009	2,854,973	2,645,035	209,938	1,975,274
2010	2,535,213	2,505,323	29,890	2,005,164
2011	1,725,326	1,916,162	(190,836)	1,814,328



Appendix 1. Finances

Exhibit A Statement of Financial Position December 31, 2011

(unaudited)

Current Assets

Cash and cash equivalents	284,408
Investments [at market]	1,498,335
Accounts receivable:	
Publications [net of allowance of \$134]	3,987
Grants and contracts	79,775
International Commission on Radiation Units and Measurements	1,819
International Society of Radiology	1,823
Other	981
Inventory—publications	310,940
Prepaid expenses and other assets	20,198
Total current assets	<u>2,202,266</u>

Property and Equipment [at cost]

Furniture and equipment	362,164
Less accumulated depreciation	345,315
Total property and equipment	<u>16,849</u>

TOTAL ASSETS

2,219,115

Liabilities

Accounts payable and accrued expenses	203,605
Total current liabilities	<u>203,605</u>

Other Liabilities

Deferred rent liability	23,600
Accrued post-retirement benefits	177,582
Total other liabilities	<u>201,182</u>
TOTAL LIABILITIES	<u>404,787</u>



Net Assets	
Unrestricted:	
Undesignated	298,741
Board designated	1,359,999
Temporarily restricted	155,588
TOTAL NET ASSETS	<u>1,814,328</u>
TOTAL LIABILITIES AND NET ASSETS	<u><u>2,219,115</u></u>

Exhibit B Statement of Activities For the year ended December 31, 2011 (unaudited)

	Unrestricted	Temporarily Restricted	Total
Revenue and Other Increases			
Contracts and grants	1,045,198		1,045,198
Contributions	150,281		150,281
Corporate sponsorship	26,500		26,500
Contributed professional services	147,600		147,600
Sales of publications	318,972		318,972
Dividends and interest	57,966	6,854	64,820
Net realized and unrealized (loss) on investments	(83,654)	(6,320)	(89,974)
Professional and administrative services	61,929		61,929
Total revenue and other increases	1,724,792	534	1,725,326
Expenses and other decreases			
Program costs:			
Contracts and grants	584,863		584,863
Publications	105,149		105,149
Contributed professional services	147,600		147,600
Total program costs	837,612		837,612
Management and general expenses	1,030,899		1,030,899
Total expenses	1,868,511		1,868,511
Investment fees	13,960	1,131	15,091
Post-retirement benefit change	32,560		32,560
	1,915,031	1,131	1,916,162
Change in Net Assets	(190,239)	(597)	(190,836)
Interfund Transfer	10,000	(10,000)	—
Net Assets at Beginning of Year	1,838,979	166,185	2,005,164
Net Assets at End of Year	1,658,740	155,588	1,814,328

Exhibit C
Statement of Cash Flow
For the year ended December 31, 2011
(unaudited)

Cash flows from operating activities:	
Change in net assets	(190,836)
Adjustments to reconcile change in net assets to cash provided by operating activities	
Depreciation	8,541
Net realized and unrealized loss on investments	89,974
(Increase) decrease in assets:	
Accounts receivable	12,582
Inventory—publications	9,744
Prepaid expenses and other assets	84
Increase (decrease) in liabilities:	
Accounts payable and accrued expenses	(35,262)
Deferred rent liability	(8,493)
Accrued post-retirement benefits	32,560
Net cash used by operating activities	<u>(81,106)</u>
Cash flows from investing activities:	
Purchase of equipment	(285)
Purchase of investments	(61,961)
Sale of investments	22,045
Net cash used by investing activities	<u>(40,201)</u>
Net decrease in cash and cash equivalents	(121,307)
Cash and cash equivalents at beginning of year	<u>405,715</u>
Cash and cash equivalents at end of year	<u><u>284,408</u></u>

Schedule 1 Schedule of Contracts and Grants Revenue For the year ended December 31, 2011

(unaudited)

Contracts

Defense Threat Reduction Agency	227,587
Department of Homeland Security	125,307
National Institute for Occupational Safety and Health	250,659
Nuclear Regulatory Commission	29,924
U.S. Navy	50,116

Total contracts	<u>683,593</u>
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Grants

Centers for Disease Control and Prevention	134,516
Department of Energy	9,979
National Cancer Institute	217,110

Total grants	<u>361,605</u>
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Total contracts and grants revenue	<u><u>1,045,198</u></u>
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Schedule 2
Schedule of Contributions & Corporate Sponsorship Revenue
For the year ended December 31, 2011

(unaudited)

Contributions

American Academy of Health Physics	1,000
American Association of Physicists in Medicine	5,000
American College of Medical Physics	500
American College of Radiology Foundation	50,000
American Nuclear Society	3,000
American Osteopathic College of Radiology	550
American Roentgen Ray Society	12,500
American Society for Radiation Oncology	3,000
American Society of Radiologic Technologists	6,000
Council on Radionuclides and Radiopharmaceuticals	2,500
Health Physics Society	22,000
Individuals	8,231
Landauer, Inc.	3,000
Lillian and Robert Brent Fund	5,000
Radiological Society of North America	25,000
Society for Pediatric Radiology	500
Society of Nuclear Medicine	2,500

Total contributions

150,281

Corporate Sponsors

3M	5,000
Landauer, Inc.	10,000
Mirion Technologies (GDS), Inc.	5,000
Nuclear Energy Institute	6,500

Total Corporate Sponsors

26,500

Appendix 2. Publications

Distribution of NCRP Publications

(during the period May 16, 1931 through December 31, 2011)

No.	Title and Year of Publication	Government Printing Office ^a	Number of Copies Distributed			
			NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
NCRP Reports						
170	Second Primary Cancers and Cardiovascular Disease After Radiation Therapy (2011)	__d	0	0	0	0
168	Radiation Dose Management for Fluoroscopically-Guided Interventional Medical Procedures (2010)	__d	286	222	508	508
167	Potential Impact of Genetic Susceptibility and Previous Radiation Exposure on Radiation Risk for Astronauts (2010)	__d	91	19	110	110
166	Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident (2010)	__d	142	36	178	178
165	Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers (2010)	__d	425	156	581	581
164	Uncertainties in Internal Radiation Dosimetry (2009)	__d	0	87	117	117
163	Radiation Dose Reconstruction: Principles and Practices (2009)	__d	79	36	273	273
162	Self Assessment of Radiation-Safety Programs (2009)	__d	69	39	435	435
161	Management of Persons Contaminated with Radionuclides (2009)	__d	123	190	974	974
160	Ionizing Radiation Exposure of the Population of the United States (2009)	__d	177	87	1,202	1,202
159	Risk to the Thyroid from Ionizing Radiation (2008)	__d	32	25	234	234
158	Uncertainties in the Measurement and Dosimetry of External Radiation (2007)	__d	25	17	669	669
157	Radiation Protection in Educational Institutions (2007)	__d	19	12	829	829
156	Development of a Biokinetic Model for Radionuclide-Contaminated Wounds and Procedures for Their Assessment, Dosimetry and Treatment (2006)	__d	17	13	739	739
155	Management of Radionuclide Therapy Patients (2006)	__d	27	42	1,039	1,039

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
154	Cesium-137 in the Environment: Radioecology and Approaches to Assessment and Management (2006)	__d	14	14	560	560
153	Information Needed to Make Radiation Protection Recommendations for Space Missions Beyond Low-Earth Orbit (2006)	__d	9	5	688	688
152	Performance Assessment of Near-Surface Facilities for Disposal of Low-Level Radioactive Waste (2005)	__d	7	6	560	560
151	Structural Shielding Design and Evaluation for Megavoltage X- and Gamma-Ray Radiotherapy Facilities (2005)	__d	77	85	3,259	3,259
150	Extrapolation of Radiation-Induced Cancer Risks from Nonhuman Experimental Systems to Humans (2005)	__d	8	3	693	693
149	A Guide to Mammography and Other Breast Imaging Procedures (2004)	__d	12	12	1,132	1,132
148	Radiation Protection in Veterinary Medicine (2004)	__d	12	18	1,147	1,147
147	Structural Shielding Design for Medical X-Ray Imaging Facilities (2004)	__d	75	97	4,114	4,114
	Compact disk version of Report No. 147	__d			143	143
146	Approaches to Risk Management in Remediation of Radioactively Contaminated Sites (2004)	__d	15	6	1,090	1,090
145	Radiation Protection in Dentistry (2003)	__d	34	63	2,135	2,135
144	Radiation Protection for Particle Accelerator Facilities (2003)	__d	37	42	2,109	2,109
143	Management Techniques for Laboratories and Other Small Institutional Generators to Minimize Off-Site Disposal of Low-Level Radioactive Waste (2003)	__d	4	2	719	719
142	Operational Radiation Safety Program for Astronauts in Low-Earth Orbit: A Basic Framework (2002)	__d	2	3	1,133	1,133
141	Managing Potentially Radioactive Scrap Metal (2002)	__d	11	9	1,224	1,224
140	Exposure Criteria for Medical Diagnostic Ultrasound: II. Criteria Based on All Known Mechanisms (2002)	__d	9	9	795	795
139	Risk-Based Classification of Radioactive and Hazardous Chemical Wastes (2002)	__d	11	8	979	979
138	Management of Terrorist Events Involving Radioactive Material (2001)	__d	32	24	7,552	7,552
137	Fluence-Based and Microdosimetric Event-Based Methods for Radiation Protection in Space (2001)	__d	4	2	767	767
136	Evaluation of the Linear-Nonthreshold Dose-Response Model for Ionizing Radiation (2001)	__d	13	14	1,350	1,350

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
135	Liver Cancer Risk from Internally-Deposited Radionuclides (2001)	__d	6	5	1,112	1,112
134	Operational Radiation Safety Training (2000)	__d	15	9	1,323	1,323
133	Radiation Protection for Procedures Performed Outside the Radiology Department (2000)	__d	11	18	1,647	1,647
132	Radiation Protection Guidance for Activities in Low-Earth Orbit (2000)	__d	6	3	1,015	1,015
131	Scientific Basis for Evaluating the Risks to Populations from Space Applications of Plutonium (2001)	__d	3	2	793	793
130	Biological Effects and Exposure Limits for “Hot Particles” (1999)	__d	10	9	1,117	1,117
129	Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies (1999)	__d	7	12	1,669	1,669
128	Radionuclide Exposure of the Embryo/Fetus (1998)	__d	15	17	1,579	1,579
127	Operational Radiation Safety Program (1998)	__d	56	9	2,296	2,296
126	Uncertainties in Fatal Cancer Risk Estimates Used in Radiation Protection (1997)	__d	8	7	1,881	1,881
125	Deposition, Retention and Dosimetry of Inhaled Radioactive Substances (1997)	__d	10	8	2,548	2,548
124	Sources and Magnitude of Occupational and Public Exposures from Nuclear Medicine Procedures (1996)	__d	11	24	3,141	3,141
123	Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground (1996)	__d	20	26	3,131	3,131
122	Use of Personal Monitors to Estimate Effective Dose Equivalent and Effective Dose to Workers for External Exposure to Low-LET Radiation (1995)	__d	32	12	3,279	3,279
121	Principles and Application of Collective Dose in Radiation Protection (1995)	__d	4	5	2,442	2,442
120	Dose Control at Nuclear Power Plants (1994)	__d	7	4	2,997	2,997
119	A Practical Guide to the Determination of Human Exposure to Radiofrequency Fields (1993)	__d	9	21	3,486	3,486
118	Radiation Protection in the Mineral Extraction Industry (1993)	__d	5	4	2,624	2,624
117	Research Needs for Radiation Protection (1993)	__d	4	3	1,941	1,941
116	Limitation of Exposure to Ionizing Radiation (1993)	__d	28	50	7,120	7,120
115	Risk Estimates for Radiation Protection (1993)	__d	9	10	3,144	3,144
114	Maintaining Radiation Protection Records (1992)	__d	6	3	2,447	2,447

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
113	Exposure Criteria for Medical Diagnostic Ultrasound: I. Criteria Based on Thermal Mechanisms (1992)	__d	3	6	3,272	3,272
112	Calibration of Survey Instruments Used in Radiation Protection for the Assessment of Ionizing Radiation Fields and Radioactive Surface Contamination (1991)	__d	13	17	3,818	3,818
111	Developing Radiation Emergency Plans for Academic, Medical and Industrial Facilities (1991)	__d	5	2	4,063	4,063
110	Some Aspects of Strontium Radiobiology (1991)	__d	3	1	2,555	2,555
109	Effects of Ionizing Radiation on Aquatic Organisms (1991)	__d	4	10	2,195	2,195
108	Conceptual Basis for Calculations of Absorbed-Dose Distributions (1991)	__d	2	4	3,124	3,124
107	Implementation of the Principle of As Low As Reasonably Achievable (ALARA) for Medical and Dental Personnel (1990)	__d	5	8	3,350	3,350
106	Limit for Exposure to "Hot Particles" on the Skin (1990)	__d	2	2	2,872	2,872
105	Radiation Protection for Medical and Allied Health Personnel (1989)	__d	11	10	6,774	6,774
104	The Relative Biological Effectiveness of Radiations of Different Quality (1990)	__d	5	4	2,406	2,406
103	Control of Radon in Houses (1989)	__d	3	3	3,757	3,757
102	Medical X-Ray, Electron Beam and Gamma-Ray Protection for Energies up to 50 MeV (Equipment Design, Performance and Use) (1989)	__d	17	20	7,707	7,707
101	Exposure of the U.S. Population from Occupational Radiation (1989)	__d	3	0	4,156	4,156
100	Exposure of the U.S. Population from Diagnostic Medical Radiation (1989)	__d	3	2	4,971	4,971
99	Quality Assurance for Diagnostic Imaging (1988)	__d	11	8	4,804	4,804
98	Guidance on Radiation Received in Space Activities (1989)	__d	1	1	3,394	3,394
97	Measurement of Radon and Radon Daughters in Air (1988)	__d	5	4	4,226	4,226
96	Comparative Carcinogenicity of Ionizing Radiation and Chemicals (1989)	__d	1	0	4,083	4,083
95	Radiation Exposure of the U.S. Population from Consumer Products and Miscellaneous Sources (1987)	__d	1	7	4,253	4,253
94	Exposure of the Population in the United States and Canada from Natural Background Radiation (1987)	__d	1	5	4,403	4,403
93	Ionizing Radiation Exposure of the Population of the United States (1987)	__d	3	7	7,367	7,367

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
92	Public Radiation Exposure from Nuclear Power Generation in the United States (1987)	__d	3	1	3,682	3,682
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	2,899	2,899
89	Genetic Effects from Internally Deposited Radionuclides (1987)	__d	3	1	3,958	3,958
88	Radiation Alarms and Access Control Systems (1986)	__d	3	7	4,792	4,792
87	Use of Bioassay Procedures for Assessment of Internal Radionuclide Deposition (1987)	__d	3	6	4,230	4,230
86	Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields (1986)	__d	1	14	5,271	5,271
85	Mammography—A User's Guide (1986)	__d	0	0	32,654	32,654
84	General Concepts for the Dosimetry of Internally Deposited Radionuclides (1985)	__d	1	5	4,249	4,249
83	The Experimental Basis for Absorbed-Dose Calculations in Medical Uses of Radionuclides (1985)	__d	1	2	3,543	3,543
82	SI Units in Radiation Protection and Measurements (1985)	__d	5	5	4,572	4,572
81	Carbon-14 in the Environment (1985)	__d	2	5	3,988	3,988
80	Induction of Thyroid Cancer by Ionizing Radiation (1985)	__d	1	2	4,265	4,265
79	Neutron Contamination from Medical Electron Accelerators (1984)	__d	5	5	4,793	4,793
78	Evaluation of Occupational and Environmental Exposures to Radon and Radon Daughters in the United States (1984)	__d	3	3	6,471	6,471
77	Exposures from the Uranium Series with Emphasis on Radon and Its Daughters (1984)	__d	0	1	6,644	6,644
76	Radiological Assessment: Predicting the Transport, Bioaccumulation, and Uptake by Man of Radionuclides Released to the Environment (1984)	__d	4	7	6,677	6,677
75	Iodine-129: Evaluation of Release from Nuclear Power Generation (1983)	__d	4	4	5,942	5,942
74	Biological Effects of Ultrasound: Mechanisms and Clinical Implications (1983)	__d	2	3	11,215	11,215
73	Protection in Nuclear Medicine and Ultrasound Diagnostic Procedures in Children (1983)	__d	2	2	5,495	5,495
72	Radiation Protection and Measurement for Low-Voltage Neutron Generators (1983)	__d	1	6	4,436	4,436
71	Operational Radiation Safety—Training (1983)	__d	0	0	5,067	5,067

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
70	Nuclear Medicine—Factors Influencing the Choice and Use of Radionuclides in Diagnosis and Therapy (1982)	__d	1	2	5,406	5,406
69	Dosimetry of X-Ray and Gamma-Ray Beams for Radiation Therapy in the Energy Range 10 keV to 50 MeV (1981)	__d	4	2	5,009	5,009
68	Radiation Protection in Pediatric Radiology (1981)	__d	5	6	4,490	4,490
67	Radiofrequency Electromagnetic Fields—Properties, Quantities and Units, Biophysical Interaction and Measurements (1981)	__d	1	6	5,444	5,444
66	Mammography (1980)	__d	0	0	4,598	4,598
65	Management of Persons Accidentally Contaminated with Radionuclides (1980)	__d	1	9	18,421	18,421
64	Influence of Dose and Its Distribution in Time on Dose-Response Relationships for Low-LET Radiations (1980)	__d	2	2	5,241	5,241
63	Tritium and Other Radionuclide Labeled Organic Compounds Incorporated in Genetic Material (1979)	__d	0	0	4,322	4,322
62	Tritium in the Environment (1979)	__d	3	2	3,951	3,951
61	Radiation Safety Training Criteria for Industrial Radiography (1978)	__d	3	6	6,164	6,164
60	Physical, Chemical and Biological Properties of Radiocerium Relevant to Radiation Protection Guidelines (1979)	__d	0	0	4,027	4,027
59	Operational Radiation Safety Program (1979)	__d	0	0	8,046	8,046
58	A Handbook of Radioactivity Measurements Procedures (1978)	__d	11	8	13,614	13,614
57	Instrumentation and Monitoring Methods for Radiation Protection (1978)	__d	3	6	10,957	10,957
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	2	3	6,837	6,837
54	Medical Radiation Exposure of Pregnant and Potentially Pregnant Women (1977)	__d	10	21	10,564	10,564
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	3	3	4,699	4,699
51	Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities (1977)	__d	0	0	8,511	8,511
50	Environmental Radiation Measurements (1976)	__d	3	6	7,915	7,915

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
49	Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies up to 10 MeV (1976)	__d	20	68	17,555	17,555
	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	6,364	6,364
46	Alpha-Emitting Particles in Lungs (1975)	__d	0	0	6,076	6,076
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	2	6,564	6,564
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	7	1	47,226	47,226
41	Specification of Gamma-Ray Brachytherapy Sources (1974)	__d	0	0	5,462	5,462
40	Protection Against Radiation from Brachytherapy Sources (1972)	__d	0	6	9,784	9,784
39	Basic Radiation Protection Criteria (1971)	__d	__e	0	40,393	40,393
38	Protection Against Neutron Radiation (1971)	__d	6	14	8,938	8,938
37	Precautions in the Management of Patients who have Received Therapeutic Amounts of Radionuclides (1970)	__d	0	0	17,402	17,402
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	17,622	17,622
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	0	0	22,362	22,362
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	3	0	9,934	34,384
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	3	0	3,828	7,972

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
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	1	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	1	0	3,073	14,922
22	Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure (1959)	52,526	3	0	7,442	59,968
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
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	7,647	58,147
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

No.	Title and Year of Publication	Number of Copies Distributed				
		Government Printing Office ^a	NCRP Publications ^b		Total NCRP Publications	All Sources Combined
			2011			
			Hardcopy	E-Pub		
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	2,427	2,038	946,711	1,906,159

Lauriston S. Taylor Lectures

35	What Makes Particle Radiation So Effective?, Eleanor A. Blakely (2011)					
34	Radiation Protection and Public Policy in an Uncertain World, Charles E. Land (2010) Health Phys. 101 (5), 497-629 (2011)	__i	__i	__i		__i
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 of Cancer ? Charles B. Meinhold (2003). Health Phys. 87 , 240-248 (2004)	__i	__i	__i		__i
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