

# HPS Health Physics News

## Radiation Safety in Today's World

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Health Physics Society

## “Meeting the Needs of the Nation for Radiation Protection” 52<sup>nd</sup> Annual Meeting of the NCRP, 11–12 April 2016

*Richard Toohey, CHP, PhD*



Officially, the 52<sup>nd</sup> annual meeting of the National Council on Radiation Protection and Measurements (NCRP)—“Meeting the Needs of the Nation for Radiation Protection”—was held 11–12 April 2016 in Bethesda, Maryland. The festivities really started, however, the night before at the annual NCRP members’ dinner on 10 April. The dinner speaker was Randall N. (Randy) Hyer, deputy director of the Center for Risk Communication. In his presentation “Breaking Bad News in the High-Concern, Low-Trust Setting—How to Get Your Story Heard,” Randy told us that communications space is only getting noisier and people are more concerned about all risks. His three key messages were:



**Randall Hyer**

- The world continues to change (the speed of communication is now almost instantaneous).
- All of us must compete, improve, and evolve to accomplish the communicator’s goal of establishing trust to create credibility.
- We must use evidence-based tools and techniques to gain public acceptance of our messages (based 50% on the communicator’s empathy, 15–20% on honesty and openness, 15% on competence, and 15–20% on all other factors).

The next day, 11 April, the annual meeting began in earnest. Judith Bader, MD, welcomed the attendees on behalf of the Program Committee, and NCRP President John Boice, PhD, briefly discussed new and continuing initiatives to improve the annual meeting. He then introduced the 13<sup>th</sup> annual Warren F. Sinclair Keynote Speaker, Richard Toohey, CHP, PhD, who presented “WARP: Where Are the Radiation Professionals?”



**Judith Bader**

*Photos courtesy of Casper Sun*

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**John Boice presents Richard Toohey with the Sinclair Medal**

Toohey reviewed the history of the NCRP WARP initiative, beginning with a workshop in 2013 and progressing to the recent publication of [NCRP Statement 12](#). The long-predicted shortfall of radiation professionals is now arriving; meanwhile, the use of radiation in medicine continues to increase, and an aging population will have increased need for medical care, especially for cancer diagnosis and therapy. The Fukushima Daiichi nuclear power station accident revealed that the United States has an inadequate number of radiation professionals for population monitoring, public health advice, medical expertise and treatment, emergency preparedness communications, and resilience and response actions. Student support and faculty research grants must be restored, and the radiological sciences must receive more attention

in science, technology, engineering, mathematics, and medicine educational initiatives. The NCRP has established Council Committee 2 to monitor the situation, advocate for support, and advise the government on this specific issue. President Boice then presented Toohey with the Sinclair Medal.



**Jackie Williams**



**Patricia Worthington**

The first session—"How Did We Get Here?"—was chaired by Jackie Williams, PhD, and Patricia Worthington, PhD. The first speaker was Larry Dauer, CHP, PhD, who presented "Radiation Brain Drain? The Impact of Demographic Change on U.S. Radiation Protection." Dauer noted that we are witnessing an unprecedented convergence of the life sciences, physical sciences, and engineering. Radiation provides significant benefits in medicine, energy, science, and industry. There is an increasing need for public, staff, and patient radiation protection. Shortfalls in scientists contrast with emerging scientific opportunities and the need for new knowledge. Radiation facilities are also disappearing and research opportunities along with them. As former Defense Secretary Robert McNamara said, "Rationality will not save us."



**Larry Dauer**

under discussion for at least 20 years. The HPS was formed 25 June 1956 with 212 members, and total membership peaked in 1994 at close to 6,500.

Membership has been decreasing ever since. Professional societies are competing for time and attention, and prospective members expect increased value of membership. The very name "health physics" is not understood and so is not conducive to recruitment.



**Wayne Newhauser**

After a coffee break, Wayne Newhauser, PhD, presented "Review of the Workforce for Radiation Protection in Medicine." The radiological disciplines relevant to medicine include medical physics, medical health physics, radiation biology, radiation oncology, radiology, nuclear medicine, radiochemistry, and nuclear engineering. Cancer cases are up, so radiation therapy is up,



**Kathy Pryor**

and the number and complexity of new technologies is also increasing. However, productivity gains have decreased, and the supply of qualified replacements has affected the retirement of the existing workforce, as has the capacity of academic and clinical training programs, health care policy, statutes, salaries, and other factors. Although supply and demand are balanced for the short term, it is difficult to say how long this will last.



**Ruth McBurney**

The next speaker was Ruth McBurney, CHP, with “The Changing Roles of State Health Physicists.” State health physicists must be generalists, especially in small programs. Source security requirements have increased, financial security requirements are increasing, and complex decontamination and decommissioning issues are becoming more prevalent. New technologies are emerging in diagnosis and therapy. States need baby boomer replacements, staff development and training, awareness of ever-changing technologies and radiation protection issues, competitive salaries and benefits (to slow the revolving door for staff between states), and surge capacity for emergency response.



**Adela Salame-Alfie and Robert Whitcomb**

After a lunch break, the afternoon session—“Where Do We Need to Be?”—was chaired by Robert Whitcomb, Jr., PhD, and Adela Salame-Alfie, PhD. The first speaker was Jerry Hiatt, CHP, who presented “Commercial Nuclear Power, Assessing and Meeting the Need.” The Nuclear Energy Institute assembled a working group in 2002 to look at the workforce pipeline and demand. A uniform curriculum program was developed, focused on radiation control technicians and maintenance workers. The workforce is not a major issue for utilities, but there is still a need for augmentation during outages.



**Jerry Hiatt**



**Kathryn Higley**

The next speaker was Kathryn Higley, CHP, PhD, with “Education or Training—Does it Matter?” Health physics is a diffuse, ill-defined field, with many different specializations. Higher education is moving to a return-on-investment model, and health physics education programs are not sustainable under that model. Professional societies can help by providing information to decision makers. Federal programs with substantial radiation protection obligations must carve out funds for research. Academic programs must cooperate; industry and government must support them; and although scholarships and fellowships are nice, large research grants are needed for faculty support. This is an area of strategic national need.

The next speaker was David Brenner, PhD, with “Estimating Cancer Risks at Very Low Doses.” We do not have cancer risk data at low doses, and there are no radiation-induced cancer markers available for humans. The biophysical argument sets 10 mGy as an anchor point, so we need epidemiologic evaluation of cancer risk at that dose. Are there radiosensitive subgroups? We might study outbred mice or screen for radiosensitivity if a marker is available. We can provide an upper bound for risk, and such an estimation gives us a reasonable basis for certainty of maximum possible effects.



**David Brenner**

After a break, Nolan Hertel, PhD, presented “Developing a Radiation Protection Hub.” Health physics programs at “major” research universities are in jeopardy. Oak Ridge National Laboratory

(ORNL) is proposing a Consortium for Advancement of Radiation Protection. The consortium would enhance the educational experience, expand research opportunities, develop a practicum program, and eventually become a research hub. Hertel said the NCRP could play a role in setting the research agenda, and the consortium could also strive for international relevance.

The next speaker was Mike Weber with “Meeting Regulatory Needs.” In 2014 the Nuclear Regulatory Commission (NRC) began Project Aim to be more responsive to change. A gap analysis included workforce planning, as the NRC employs 170 health physicists and other radiation professionals. The NRC has approval from Congress to support the integrated university program grants. A Nuclear Energy Agency survey showed new hires cannot immediately replace retirees. Consequently, concern continues to grow, with increasing complexities and demands in radiation protection.



**John Poston (left) and Mike Ryan**

After a break, Mike Ryan, CHP, PhD, introduced his teacher, colleague, and friend John W. Poston, Sr., PhD, who presented the 40<sup>th</sup> Lauriston S. Taylor Lecture on Radiation Protection and Measurements, “Radiation Protection and Regulatory Science.”

Poston explained that K.Z. Morgan introduced him to Laurie Taylor, who followed and assisted Poston’s career. Poston thanked his students, mentors, and colleagues for their contributions to his career quipping, “As they say in Texas, if you’re driving down the road and see a turtle sitting on a fencepost, you know he didn’t get there by himself.”

Poston noted that he only learned what regulatory science is about a year ago—from a student doing a dissertation in the area. Regulatory science is now a well-established branch of applied science that clearly pertains to a wide variety of federal agencies and their regulations; however, Poston does not believe regulatory science has a role to play in the future of radiation protection. Poston pointed out that there is actually a lot of common sense in practice; unfortunately, radiation protection is no longer a two-pronged discipline, as the research component has been lost. On the other hand, every International Commission on Radiation Protection (ICRP) report changes nomenclature, definitions, and goals without any new science driving the changes.

What is the cost of these changes in regulations that produce no effect on radiation protection? What is the net benefit to all this, when existing doses average less than 2 mSv annually? At the conclusion of the lecture, Boice presented the Taylor Medal to Poston.



**Don Miller**

The annual business meeting began the next morning. Don Miller, MD, chair of the Nominating Committee, presented the election results. A complete list of new and continuing members is available on the [NCRP website](#).

Boice presented his president’s report. NCRP has seven draft reports in the pipeline for publication in 2016. NCRP hosted a very successful workshop on technologically enhanced naturally occurring radioactive material (TENORM) at the 2016 Health Physics Society (HPS) Midyear Meeting in San Antonio, Texas. Based on this success, NCRP expects to partner with HPS to provide content to the next HPS midyear meeting, which will be held 22–25 January 2017 in Bethesda, Maryland. Boice noted that the topic of the 2017 NCRP Annual Meeting will be “Emergency Preparedness for Nuclear Terrorism: What Are the Remaining Gaps and Is There a Need for Realignment of National Efforts?”



**Nolan Hertel**



**Mike Weber**



Chad Mitchell and Pamela Henderson

After a break, the third session of the program—“How Do We Get to Where We Need to Be?”—was chaired by Pamela Henderson and Chad Mitchell, PhD.

The first speaker was Shaheen Dewji, PhD, with “Critical Issues in Knowledge Management in Domestic Radiation Protection Capabilities.” The Center for Radiation Protection Knowledge at ORNL recognizes that institutions must conduct a knowledge-loss risk assessment to identify experts with critical knowledge, determine the attrition risk factor, create a documented knowledge-retention plan,



Shaheen Dewji

monitor and evaluate efforts to measure success, and set milestones. The NCRP can help identify knowledge needs in research and required resources (including people); the alternative is getting radiation protection guidance from Europe and Asia.

The next speaker was Matt Moeller, CHP, who presented “The Business of Health Physics: Jobs in a Changing Market.” Safety was an ancillary function in the laboratory from 1895 to 1940. Needs grew in the 1950s (during the Cold War) and 1960s (after public exposures). Current needs include medicine and decontamination and decommissioning, especially in the weapons complex. Generalists rather than specialists are filling positions. We need to accept the economics, develop job standards, make health physicists more relevant to broader operations (industrial hygiene, integrated safety management, conduct of operations), and thereby take someone else’s job by capturing more responsibility.



Matt Moeller



Steve Mussolino

After a break, the next speaker was Steve Mussolino, CHP, PhD, with “Meeting the Needs of First Responders: Scientific Experiments to Operational Tactics for the First Ten Minutes After an Outdoor Explosive Radiological Dispersal Device.” Radiation protection experts do not routinely respond to emergency situations. So who is the local radiological expert who can interpret data and assist decision makers? The answer is the radiological operations support specialist (ROSS). In the case of a nuclear detonation, ROSS support will be critically important to decision makers.



Don Frush

The final speaker was Don Frush, MD, who presented “Meeting Medical Needs.” Physicians have not been successful stewards of patient radiation protection, and there is an urgent need for risk literacy among physicians. Members of the medical community are not epidemiologists, dosimetrists, or risk experts, and they need help from radiation protection experts.

President Boice then presented “NCRP’s Vision for the Future.” He noted that it is clear that there are simply not enough radiation professionals to meet national needs, especially in a radiological emergency. In his concluding remarks, Boice thanked the Program Committee, session chairs, speakers, and volunteers. He stated this was possibly the most interactive NCRP meeting ever, with an unbelievable number of questions and interactions on this vital topic. Watch for a future issue of *Health Physics Journal* with full proceedings from this meeting.



John Boice