# Health Physics News

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*The Official Newsletter of the Health Physics Society*


## In This Issue



NOTE
The HPS Preliminary Program was NOT sent via regular mail this year. It is only available online at http://hps.org/documents/50preliminaryprogram.pdf.
(See page 10 for more information.)

# The Birth of the HPS: A Look Back

## Getting Started
## The First Meetings

*Mary Walchuk*

Fifty years ago Frank Bradley was a radiation safety officer at Ohio State University (OSU). Thinking at that time "that at this stage in the development of Health Physics or Radiation Safety, it is time we had a conference or symposium on Health Physics," Bradley wrote to his former teacher and mentor, Elda E. Anderson, with a proposal for such a conference. The Health Physics Conference was held at OSU 13-15 June 1955 and was followed by the first annual meeting of the new Health Physics Society at the University of Michigan 25-27 June 1956. Bradley shares his memories of that time and the birth of the Health Physics Society (HPS).

**Frank Bradley**

**How did the idea for the 1955 Health Physics Conference come about?**

**Bradley:** The idea was simple and straightforward—many health physicists were working at universities and in industry with radioactive material, accelerators, and x-ray equipment in relative isolation. To name a few: Herman Cember at the University of Pittsburgh, Artie Emmons at the University of Michigan, and me at Ohio State. I brought the idea of a health physics conference to Elda E. Anderson—for many of us, our mentor. While students at Oak Ridge National Laboratory (ORNL) we had health physics seminars with specialists from throughout the Atomic Energy Commission (AEC) complex—Argonne, Berkeley, Hanford, Los Alamos, and Brookhaven—and there had been health physics conferences within the AEC complex before 1955. I, myself, gave some lectures at OSU but it would have been great to have interaction with other health physicists.

Elda liked the idea and obviously got the support of Karl Z. Morgan, director of ORNL, Health Physics Division. A committee was formed and we met several times in Oak Ridge, Tennessee. We decided that the conference would cover broad topics—exposure to ionizing radiation, safe limits, waste

*(continued on page 2)*

*(continued from page 1)*

disposal—many topics still of importance to health physics. Elda was the spearhead: she knew everyone of importance in health physics and radiological physics in the AEC complex and at the various universities. Most national labs had universities associated with them. There were obviously many behind-the-scenes discussions, most of which I was not privy to. There were considerations of security and allocation of time and funds for speakers. Dr. Walter Claus, director of the AEC Biology and Medicine Division in Washington, DC, was important in these considerations, I presume.

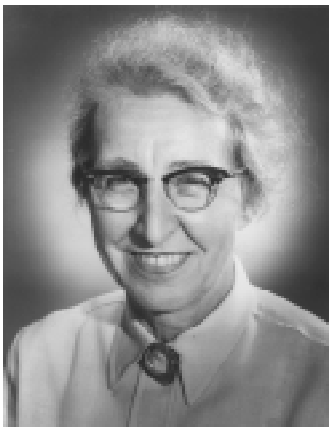
While we were formulating our ideas for a health physics conference, President Dwight D. Eisenhower broached the idea of an Atoms for Peace program because, from his perspective as a former military man, there was no rational strategic military value to thermonuclear weapons. He believed that with the United States possessing nuclear technology we should share it—with appropriate safeguards—with other nations. In fact, some who would have liked to attend the Health Physics Conference at OSU, such as Dr. Gioacchino Failla, stated they were preparing for the first Atoms for Peace conference in Geneva in August 1955 and could not attend.

**What was your role in the decision to hold the conference?**

**Bradley:** I presented the need for a health physics conference to Elda. I believed that the information that such a health physics conference would generate would best take place in a university setting and OSU was host to many conferences on a wide variety of topics. I was the superintendent in the Office of Radiation Safety at OSU and recommended that the Health Physics Conference be held at OSU. I, of course, had to get approval from OSU administration, and Dr. Frederick Heinberger, vice president, and Professor Edwin Dreese, chairman of the OSU Radiation Safety Committee, were instrumental in this regard.

**How did you know Elda Anderson and how did you end up working with her to organize the conference?**

**Bradley:** I—with Herman Cember, Allen Brodsky, Les Rogers, Doc Emerson, Bill Warren, John Byron, Bob Bernard, Bob Sodaro, S. Marshall Sanders, and Forrest Buck—was a student of Elda. She was chief of the health physics training program at Oak Ridge National Laboratory—a unique AEC fellowship program in which we spent 12 months in Oak Ridge attending class and working on practical health physics projects at the lab, a great hands-on experience. We were the 1949/1950 class, a propitious time to graduate because the whole AEC complex was expanding with thermonuclear devices and the start of the Korean War. Most of us had served in the Army but Les Rogers was called back and Allen Brodsky was grabbed from the National Bureau of Standards for service in the Pacific nuclear testing theater.



**Elda E. Anderson**

**How did Elda Anderson choose to whom to write letters for suggestions of topics and speakers for the Health Physics Conference?** (See letter on page 5.)

**Bradley:** Elda knew everyone in the field. The topics—including genetics, which was a red-hot topic at the time—were of concern to all persons working with ionizing radiation. (Dr. Earl Green, a geneticist from OSU on loan to the AEC, gave a talk and there was some concern regarding publicity and it was held in a very crowded faculty club.)

**How were the speakers and topics chosen for the 1955 Health Physics Conference?**

**Bradley:** The conference planning committee met several times in Oak Ridge to select the topics and speakers. Elda knew everyone in the AEC complex and universities with AEC contracts. Les Rogers was with AEC Licensing and Standards Branch and knew what was of concern to AEC licensees.

**What were the most important topics discussed at the 1955 conference?** (See list of talks on page 5.)

**Bradley:** All the topics were important and many still are, like waste disposal, but I presume that the jury is out on genetics. The heat has died down on that topic in radiation.

**Was it decided at the 1955 Health Physics Conference to form the HPS and have the first annual**

**meeting the next year?**

**Bradley:** We held a meeting—I believe on Sunday, 11 June 1955—in my campus office, a World War II barracks, with the Conference Committee and K.Z. There was a decision spearheaded by K.Z. and Elda to hold an organizational meeting, outside of the regular conference meetings, to determine if there was sufficient interest in a society of like-minded professionals. I was able to obtain one of the lecture halls for this purpose; the Conference was held during interterm recess.

At the formation meeting, held I believe on 13 June 1955, K.Z. was elected as president-pro tempore of a society initially called Health Physics Society, but this name was not universally liked by all. Others, such as Ed Barnes, director of Industrial Safety and Radiation at Bettis Atomic Power Lab and a "power" in the American Industrial Hygiene Association, believed that a Society would be "railroaded" through—in a good-natured manner.

As I mentioned, the name Health Physics for the society was somewhat contentious. At the 1955 meeting we called the society the Health Physics Society. K.Z., Elda, et al. were all members of the Health Physics Division of ORNL and it was a logical choice for them. During the Manhattan Project K.Z. and other physicists were assigned to problems involving radiation exposure and health, hence they were the first health physicists. Those from the University of Chicago liked the term radiological physics. Those at Oak Ridge called it health physics.

At the second meeting there was a vote on the name of the society. As I recall, one name suggested was something like Radiation Safety Society. At the meeting someone from the audience suggested another name, Radiation Hygiene Society. This, of course, split the vote and the name Health Physics Society was selected by majority vote.

**How was the University of Michigan chosen for the 1956 HPS Annual Meeting?**

**Bradley:** The first three meetings were held at universities and we all knew each other. The University of Michigan was initiating a very ambitious program called the Phoenix Project and Artie Emmons was the radiation safety officer at the university and was the driving force. He was a member of the first AEC Fellowship class at ORNL (1948/1949). He later became a university vice president, I believe. (The 1957 meeting was held at the University of Pittsburgh Graduate School of Public Health. Herman Cember was the driving force. The 1958 meeting was held in Berkeley, California, near the University of California Campus. At this point, it was decided because of the size and logistics of holding such annual meetings that the next one would be held in Gatlinburg, Tennessee, close to ORNL, and Doc Emerson and Elda were important in hosting that meeting.)

**How were the topics and speakers for the 1956 meeting chosen?**

**Bradley:** Again, topics and speakers were chosen in a similar manner to the first meeting but I do not have the particulars in my head. But, Elda and Artie Emmons and possibly some of the faculty at the University of Michigan were instrumental in choosing the topics.

**What were the most important topics discussed at the 1956 annual HPS meeting?** (See list of talks on page 8.)

**Bradley:** Precisely I do not recall—but some of the topics included fallout, waste disposal, dosimetry, and biological effects.

**Are there topics that were discussed at the 1955 conference and the 1956 meeting that are still being discussed at annual HPS meetings now?**

**Bradley:** Some, like genetics and fallout, have dropped off the radar screen. Others, such as waste disposal, are still very much with us. Some, me included, believe that the topics of major importance to AEC at the time—that is, fission, fission products, activation products, and reactors—were only part of health physics and it was broader and other areas such as you encounter in a university or industrial environment—that is, x rays, accelerators, and nonionizing radiation—should be included.

**Did people come from long distances for the two meetings? What was the most common way to get there—train, car, plane?**

**Bradley:** There were people from all over the country and probably Canada. Most, the AEC people, were accomplished world travelers. Many (Elda, Myron Fair, Doc Emerson) gave health physics seminars throughout the world. I drove to Ann Arbor from Columbus, Ohio. I presume most others flew.

**What were the meeting programs like? What was involved in getting the programs printed and distributed to the meeting attendees?**

**Bradley:** For the 1955 Health Physics Conference, the programs and attendance dinner cards were printed at the OSU Press. The cost came from the Office of Radiation

Safety budget. To be quite frank, once I got Dr. Heinberger's approval I never gave too much thought to such matters. The mailing lists came from Elda. If attendees wished, dormitory rooms were available on campus for $2 per night. An interesting sidelight, Elda was having dinner at my house with others Sunday night, but at 10 p.m. someone from the dormitory called and asked where Elda was—there were strict curfew rules at women's dorms in that era. We got a good laugh out of it.

The proceedings were typed by my wife, Bonnie Klei Bradley, now deceased, from manuscripts submitted by the authors. They were mimeographed at OSU.

**What were the meeting facilities like and how did the speakers present their talks?**

**Bradley:** There were large lecture halls; microphones and slide projectors were in common use and OSU had a staff to provide such services for conferences. The one genetics lecture that I mentioned that AEC was a little sensitive about was held in a crowded faculty dining room.

**How long did the talks last?**

**Bradley:** I do not have the program, but I believe we gave the speakers the amount of time they felt they needed—15 to 60 minutes—but there were no long extemporaneous harangues that I recall.

**How long did the meetings last?**

**Bradley:** Two and a half days, Monday morning to Wednesday at noon with Monday and Tuesday evening dinner speakers featuring K. Z. Morgan and possibly Lauriston Taylor and Dr. Earl Greene. There was time for a business meeting on Tuesday afternoon; this was the business meeting that formed the Health Physics Society in 1955. We had left time for visits to some of the campus radiation facilities—cyclotron, nuclear medicine, radiology, and radiochemistry.

**How were the meetings different from now?**

**Bradley:** The meetings were smaller and more intimate. We did not have a vendors' exhibit hall. We had technical excursions but no recreational excursions.

**You wrote in your introduction to the proceedings from the 1955 Health Physics Conference, "The main purpose of the conference is to draw together persons working in this field so that they may hear the latest developments from specialists and to discuss their problems with these specialists." Do you feel this is still the purpose of HPS meetings?**

**Bradley:** I would say this is a commendable objective and still should be the one of the objectives of the meetings, but health physics is now a much more mature and regulated art. In many ways at that time individuals were fairly free-wheeling pioneers and aggressive in their attempts to open up new avenues and ways to use ionizing radiation.

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**Editor's Note:** On the following pages are reprints of a letter and pages from the proceedings from the 1955 and 1956 meetings. It is interesting to note the similarities and the differences between meetings then and now and also to see how many of the speakers at the original meetings have continued to be active over the last 50 years.

"The Birth of the HPS: A Look Back" will continue in upcoming issues of *Health Physics News*. Look for more interviews with distinguished HPS members about the beginnings of the Health Physics Society.

The June 2005 issue of *Health Physics* is a special commemorative issue in which 13 Review Articles that have appeared one or two at a time in recent journals are collected together in one volume. The articles, covering a variety of basic topics important to radiological science and health physics, summarize the history of radiation protection, discuss the current state of health physics, and then take a look ahead at the future of our profession. They were commissioned by Journal Editor-in-Chief Michael T. Ryan and Associate Editor and Special Series Editor John W. Poston, Sr., who said, "This 50th Anniversary issue will be valuable to students, practicing health physicists, and others with interest in the profession."

November 17, 1954

Dear _____:

For some time there has been a strong feeling on the part of Dr. Claus of the AEC and others that a general conference on Health Physics is much desired. Francis Bradley, Office of Radiation Safety, Ohio State University, wrote me last May as follows: "Seeing all the Conferences going on around here and for other reasons, I have been thinking the last month or so that at this stage in the development of Health Physics or Radiation Safety, it is time we had a conference or symposium on Health Physics." Later--September 24--"I am more convinced than ever that a conference to review the entire field of safety is imperative. I have written to University Vice-President Heimberger, Ohio State University, about it and he is enthusiastic." Later Mr. Bradley mentioned the proposed conference at a meeting of the council of Participating Universities which he attended at the Argonne National Laboratory and everyone agreed to the need for a conference and suggested that publicity for the conference could go out through the Council.

I suggested to him the following approach to setting up a program: A request to a number of Health Physicists to submit one or more questions, problems or topics which they would like discussed and/or which they might be willing to discuss for 10 minutes, following which the topic would be opened for general comments or perhaps to a panel of experts for additional comments. In addition to the above brief informal discussions to have several invited papers (30 to 60 minutes in length) by experts in the various fields.

Now for the purpose of this letter: We are asking you as one of the people actively working in the field of Radiation Protection to submit topics, problems, questions you would like to see placed on the program and to indicate your willingness to discuss one or more of them and to add suggestions for invited papers and/or speakers. Briefly, fill out the enclosed sheet and return to me so that the self-appointed committee (membership unknown) can start plans for a conference this spring.

Sincerely,

Elda E. Anderson, Chief
Education and Training Section
Health Physics Division

## 1955 Health Physics Conference

- Orphans in Wonderland, *Lauriston S. Taylor*
- Criteria for Waste Disposal, *Conrad P. Straub*
- Waste Disposal Techniques in Non-Atomic Energy Commission Laboratories, *Lester R. Rogers and G.W. Morgan*
- Waste Disposal in AEC Installations, *J.W. Healy*
- Air Sampling for Radioactive Particulate Matter, *H.F. Schulte*
- Air Sampling for Radioactive Gases, *Jess W. Thomas*
- Quote, Qualified Expert, Unquote, *Lauriston S. Taylor*
- Organization of Health Physicists, *Karl Z. Morgan*
- Theory and Practice of Dose Measurements, *John S. Laughlin*
- A Halogenated Hydrocarbon-Dye Water Equivalent Method of X- and Gamma Radiation Measurement, *Sanford C. Sigoloff*
- Radiation Control Legislation in the United States, *Lauriston S. Taylor*
- Regulation on Radioactive Material in Transit, *Hanson Blatz*
- Legal Aspects of Control, *Robert Lowenstein*
- Universities, *A.H. Emmons*
- A.E.C. Contractors, *Earl R. Ebersole*
- Atoms and Genes, *Earl L. Green*
- Contamination Levels, *A.L. Baietti*
- A.E.C. Radiological Safety Program and Radioisotope Distribution, *G.W. Morgan*
- A Survey of Instrumentation Development, *Robert L. Butenhoff*
- Proposed Dosage Determination in Beta-Gamma-X-Ray Film Dosimetry at ORNL, *E.D. Gupton*
- Fallout, *Gordon M. Dunning*
- Laboratory Design, *A. Mackintosh*
- Shielding Problems, *R.H. Ritchie*
- Determination of Internal Radiation Exposure from Urinary and Fecal Excretion, *Wright H. Langham*
- Health Physics Organizations in Industry, *E.C. Barnes*

O. S. U.
HEALTH PHYSICS CONFERENCE
June 13, 14 and 15, 1955
Columbus, Ohio
Sponsored by
OFFICE OF RADIATION SAFETY
THE OHIO STATE UNIVERSITY
with the cooperation of
United States Atomic Energy Commission

## Introduction

One may ask what is to be accomplished by a Health Physics Conference? More fundamentally, one might ask what is Health Physics? A personal definition of Health Physics is "that" which allows one to walk through a lab or plant (or countryside) where ionizing radiation is being used or made with a relatively clear conscience that one is not being bombarded with radiation to an injurious extent. I hope that out of this Conference a more objective definition will arise that will replace this purely subjective one.

The main purpose of the Conference is to draw together persons working in this field so that they may hear the latest developments from specialists and to discuss their problems with these specialists. A relatively large portion of time, therefore, has been allotted to discussion periods. Many of the questions that will arise probably no definite answer can be given as yet, but the discussion of them will help in the formulation of the answers. Since this is the first Conference in this field that has been held, it is hoped that a wide audience will be reached and that it will attract persons actively engaged in Health Physics.

The program has been planned by the Program Committee following the receipt of questionnaires that were sent to persons in this field throughout the United States.

At present it seems we are standing at the crossroads. A good deal of experimentation, and theorizing has been done; in the field of particle accelerators; e.g. the X-ray machine and Cyclotron, much has been accomplished; but in utilizing the energy in the nucleus the surface has only been scratched. And, we must remember that no matter what process is used to obtain the energy from the nucleus (fission, fission-fusion or some as yet undiscovered process) that it will undoubtedly be accompanied by ionizing radiation. Therefore, the future appears challenging for us, for progress with the nucleus can only progress as fast as we in this field can control or utilize the radiations.

Many thanks must be extended to many people, in particular Dr. Elda E. Anderson for without her and the whole-hearted co-operation of the United States Atomic Energy Commission this Conference would have had a hard time being more than a persons dream.

Office of Radiation Safety
The Ohio State University

Program Committee:
Dr. Elda E. Anderson, Chairwoman, Oak Ridge National Lab.
Francis J. Bradley, Ohio State University
Lewis C. Emerson, Y-12 Area, Oak Ridge, Tennessee
Myron F. Fair, Oak Ridge National Lab.
Lester R. Rogers, Isotopes Division, U.S. AEC, Oak Ridge, Tenn.

PROCEEDINGS of the HEALTH PHYSICS SOCIETY
First Annual Meeting
June 25-27, 1956
University of Michigan
Ann Arbor, Michigan
Sponsored By:
THE RADIATION CONTROL SERVICE AND
THE NUCLEAR ENGINEERING COMMITTEE
of the
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

## FOREWORD

Health physics, as known today, began its existence at the Metallurgical Laboratory of the University of Chicago in the fall of 1942, about the time of the start-up of the first nuclear reactor on December 2, 1942. It had its initial meeting as a group of professional associates last year (1955) at Ohio State University. At that meeting the health physicists voted almost unanimously to form a society, and this year at the University of Michigan, with the adoption of a Constitution and Bylaws, the election of officers, and the selection of a name, the Health Physics Society had its birth.

It is of the greatest significance that this is not exclusively an American organization. Although most of the 748 charter members are from the United States and Canada, it is hoped that ultimately the Society will have members from all countries of the world. Truly health physics is a sphere of activity in which all people of the world have a vested interest and in which they should be vitally concerned, and the exchange of information on problems of protection from ionizing radiation must not be hampered by secrecy restrictions or by national and political limitations.

Many new problems in applied health physics are being introduced as a result of the rapidly expanding peacetime uses of radioactive materials, the prospect of atomic energy becoming an important source of electrical power, and the establishment of state, federal, and international control of radiation hazards. Likewise, there are many new research opportunities in health physics; e.g., methods of radioactive waste disposal must be developed, methods which are safe, economical, and compatible with a large atomic energy power industry. Hence, the Health Physics Society includes members who are engaged in both applied and research activities relating to radiation protection.

The papers given at this Health Physics Conference at the University of Michigan do not cover more than a random sampling of the many health physics activities. They are sufficient, however, to indicate that health physics is very broad in its scope, supplying structure and stature in the great voids between the conventional interests of the well established sciences of physics, biology, chemistry, medicine, and engineering. This is only the beginning of an organization dedicated to the advancement of the peacetime application of atomic energy and directed in a manner that is intended to bring a maximum of benefit and a minimum of suffering to all mankind. The health physicists are, in no small measure, responsible for making the atomic energy industry one of the safest major industries in the world today in spite of its immense potential for radiation hazards. So long as men continue to dedicate their lives to the problems of health physics, just so long can we expect this freedom from radiation injury to continue in the atomic energy industry.

K.Z. Morgan
President, Health Physics Society

PROGRAM COMMITTEE

| | |
|---|---|
| F.P. Cowan, Chairman | G.W. Morgan |
| L.J. Deal | J.V. Nehemias |
| W.A. McAdams | J.F. O'Brien |
| D.D. Meyer | H.W. Patterson |

# 1956 Health Physics Society First Annual Meeting

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## ABSTRACTS

# Editorial

## Forgetting the Front Line

*Mark L. Maiello, PhD*

Our antiterrorist preparations require a strong response to attacks on the homeland. It has been revealed that one group on our front line has been neglected.

This information comes from the New York University Center for Catastrophe Preparedness and Response (NYU CCPR) (http://www.nyu.edu/ccpr/pubs/NYUEMSreport.pdf). A December 2004 national roundtable was held by NYU CCPR to improve the strength and capabilities of the nation's emergency medical (paramedic and medical technician) services (EMS). The roundtable report revealed the shortcomings of the present EMS system—the system supposed to render front-line aid to those injured in a chemical, biological, or radiological attack.

Perhaps the most startling fact is that although EMS personnel make up 33% of first responders (the police and firefighters make up the balance), EMS receives only 4% of the various government funding programs available. Due to this paltry funding, the nation's EMS personnel do not have the proper equipment to respond to a chemical, radiological, and biological event. They could easily become victims themselves.

Training of EMS personnel for chemical, biological, and radiological attacks is also minimal. Less than 33% of EM technicians (EMTs) had participated in drills involving chemical, radiological, or biological hazards in 2004. Urban EMTs have only a total of about 3.5 hours of homeland security disaster training since 9/11. Their rural counterparts and those unaffiliated with a fire department have only one hour at best.

Much of this inadequacy is due to the management of the nation's EMS system. Many ambulance providers cannot complete the government grant application process. EMS personnel are not well represented when communities discuss emergency preparedness plans. Only 37 states have an EMS medical director whose job it is to establish quality emergency care, to plan for emergencies, and to coordinate EMS with fire, police, and public health disaster efforts. Did you know that only five states provide total coverage to their inhabitants for 911 calls?

The NYU CCPR report emphasizes the EMS response to biological terrorism. The emphasis is probably unintentional because EMS personnel are adept at analyzing a patient's condition for a biologically based illness. However, the need to diagnose or consider the diagnosis of a radiological event is very important (a chemical event is just as important but may be more apparent to EMS personnel due to obvious effects like skin and eye reactions). But what if an EMT cannot use a Geiger counter properly or react appropriately, that is, not panic to a few hundred or thousand counts per minute?

There are few references to radiological issues in the report. It can be assumed that without the proper education in the health physics aspects of a radiation event, EMS personnel will have the same misconceptions and fears about radiation that most people do. This is not tolerable for those who must enter potentially dangerous areas in order to save lives.

I was a bit chagrined to see that NYU faculty representation on the CCPR does not include anyone from my old department of environmental medicine that had, at one time, a vibrant radiological physics program. In fact, I could not identify any radiation expert on the CCPR staff. It indicates that, at least in this instance, radiological issues are not being treated equally with the other terrorist threats. EMS personnel will suffer greatly unless trained to some degree about radiation doses, measurements, and related biological effects. The front line should be as strong as we can make it.

As for the Health Physics Society and our training efforts for homeland security, our audience just got larger.

**Reference**

Emergency Medical Services: The Forgotten First Responder. New York University Center for Catastrophe Preparedness and Response, 2004. Available at: http://www.nyu.edu/ccpr/pubs/NYUEMSreport.pdf. Accessed 5 May 2005.

# Inside the Beltway

*David Connolly*
*Washington Representative*
*Capitol Associates, Inc.*

At our firm, we have an extensive intern program whereby students spend a semester working side by side with the staff, learning about the workings of Congress. One of the values of such a program is the need for the staff to adopt a "teaching mode" in pointing out to the students the elements of the legislative process. As we tell our interns, two of the key elements of this process are *timing* and *persistence*. Nothing illustrates this concept better than the current debate on energy policy that now has come to the forefront of domestic political issues.

Next to the President's desire to reform social security, the "hottest" domestic issue right now in Washington is the nation's energy policy. Sound familiar to the over-40 set? As briefly alluded to in last month's article, $2+ per gallon gasoline prices has been the event which has reenergized the whole discussion of energy policy in this country. The importance of *timing*. With the reopening of the discussion on energy policy, all different types of energy production and conservation are being examined and, in some cases, rediscovered by the Congress. In a remarkable transformation, nuclear power is emerging from the tense perceptions of Three Mile Island and Chernobyl and once again being seriously considered as a key element to achieve the goal of freedom from dependence on foreign oil. All of a sudden, the experts in the nuclear field are being sought after for their opinions and data on the workings, efficiency, cost, and safety record of nuclear power in this country. If groups such as the Health Physics Society had not maintained a Washington, DC, presence over the years, this information would be much less available to congressional policy makers. The value of *persistence*.

During the last week of April alone, there were at least three different congressional hearings on the topic of either energy policy or, more specifically, nuclear power. In a rare prime-time news conference during that week, President Bush touched upon and emphasized the need for a new examination of the energy needs of this country. Now is the time for Society members to vigorously participate in the national debate on the role nuclear power should play in attaining energy independence from foreign sources of oil and gas. Through the local media and contacts with congressional members, we should be framing the discussion on our expanding need for new sources of nuclear power. If there is a political campaign already going on in your state, such as the race to succeed retiring Senator Paul S. Sarbanes in Maryland, buttonhole the candidates and pin them down on their position on nuclear power. Letters to the editor on the articles or editorials appearing in your local newspaper are an excellent way to put forward your opinion. Remember you are the expert on this issue and your community needs to hear your voice.

In grade school, most children learn about proverbs. Reemphasizing what they have already been taught, we stress to our interns the old adage, "Strike while the iron is hot." The iron has not been this hot in 20 years, so strike!

## NOTE

The Health Physics Society (HPS) Preliminary Program was NOT sent via regular mail this year. It is only available online at http://hps.org/documents/50preliminaryprogram.pdf.

Both the complete scientific program and the preliminary program with hotel, airline, car, and registration information are on the HPS Web site under the Spokane Annual Meeting at http://hps.org/newsandevents/meetings/meeting4.html.

Online registration for the meeting is also available at https://host5.visualpresence2000.com/fororg/hps/2005AM/index.php3.

# Correspondence

## Thinking Inside the Box

*Robert L. Dixon*
*Winston-Salem, North Carolina*

The recent letter by Richard Osborne (*Health Physics News*, April 2005, p 6), in which he uses a staircase risk analogy, has emboldened me to once again write a letter concerning the "inside of the box" thinking which so often prevails in radiation protection, that is, thinking in terms of a "universe" in which radiation is the only risk and therefore lower is always better. The data of Tengs (1995), shown below, illustrates that quite well:

**Cost of various interventions per life-year saved (Tengs 1995)**

| | |
|---|---|
| Radiation emission standards for nuclear power plants: | $100 million/life-yr |
| Radionuclide emission control at NRC-licensed facilities: | $2.6 billion/life-yr |
| Widen lanes on rural roads by two feet: | $120,000/life-yr |

The last entry led me to speculate about what it would be like if the "Radio-Protectors" were put in charge of our transportation system. It is an inarguable fact that reducing speed will reduce risk—and not just some hypothetical risk based on a risk coefficient ("death by coefficient"). If you are hit by a car you are really (most sincerely) dead. Then perhaps we should all drive ALARA (particularly since we are always talking about it)—see how slowly you can creep along. Nonsense, you say, there is a benefit to driving faster. Well, maybe for you, but is there a benefit to the pedestrian walking along the roadside to your going faster? So here's a little parody on the way the speed limit might go if the "Radio-Protectors" were put in charge.

**Commentary #1 on the Public Speed Limit**

*NCRP Report No. 116 model:* Speed limit 60 mph (but we recommend 15 mph unless you have investigated what lies ahead).
*ICRP model (with "constraints"):* Speed limit 60 mph (but not over 20 mph since you may drive on multiple highways or have multiple autos).
*NRC model:* Speed limit 60 mph (but ALARA I-20 mph and II-40 mph).
*EPA model:* GET out of the house now! IF you have to drive (and we don't recommend it), drive fast since highway paving materials have enhanced natural radioactivity.
*Highway signs:* Chicken crossing: theirs not to reason why, theirs but to do or die.

Why not just make the public speed limit 20 mph, you ask? Ach so . . ., perhaps you too are beginning to catch on to their scheme.

Does it sound silly to you? Then maybe, just maybe, some of the rules related to radiation are of the same character—let's think about it and not let the chicken-crossing sign apply to us. For example, when you give it a little thought, the rationale for the ICRP "source constraint" concept assumes that a given person (or a given source) can simultaneously be in more than one location.

**Reference**

Tengs TO, Adams ME, Pliskin JS, Safran DG, Siegel JE, Weinstein MC, Graham JD. Five-hundred life-saving interventions and their cost-effectiveness. Risk Anal 15(3):369-390; 1995.

## Safety of Low-Level Radiation

*Laurence F. Friedman, PhD, CHP*
*Chicago, Illinois*

With regard to answering questions about the safety of low-level radiation, the subject of a recent letter in *Health Physics News* (April 2005, p 6) . . .

I never answer this question. I respond instead by reminding the questioner that we are all mortal. I then point out that exposure to the levels of radiation encountered in the workplace or the environment will not affect that outcome in any way.

The problem with the question of whether radiation is "safe" is that it ignores the null hypothesis, that is, what will happen to the subject if the exposure does not occur. This is also the problem with the ICRP (International Commission on Radiological Protection) dogma that if enough people are exposed to a low dose of radiation one of them will suffer a radiogenic cancer. Aside from the fact that the assertion can't be verified and therefore doesn't qualify as "science," it ignores the fact that the person will die in about the same time frame if he/she is not exposed.

The question that should be asked is not whether the exposure is "safe" but rather whether anything will change as a result. The latter question can safely be answered "no."

## Response to Dixon and Friedman

*Richard V. Osborne*
*Deep River*
*Ontario, Canada*

In his entertaining letter, Professor Dixon takes issue with the idea of source constraints. I think the concept is not as absurd as he suggests. The annual dose limit is intended to limit the lifetime dose received by any individual from the totality of all regulated sources of radiation. In reality, such regulation is achieved by placing limits on each particular source, for example, on the emissions from a nuclear power plant. It is quite conceivable that individuals in the most exposed group from any such source may also be exposed to another regulated source. The limit that the regulator places on such emissions needs therefore to take into account any such overlap of exposures; in effect the limit is "source related" and the annual dose associated with it may be numerically less than the individual dose limit. In ICRP (International Commission on Radiological Protection) terminology this limit has been called the "dose constraint." It may well be that in most circumstances exposures to multiple sources can be ignored but the conceptual distinction between the individual-related dose limit and the source-related dose constraint is important. In its draft 2005 recommendations, the ICRP has taken the concept of source-related constraint way beyond merely reflecting overlapping exposures and has suggested values for the dose constraints in various circumstances. It remains though for national regulators to set source-related dose constraints case by case.

The comment by Dr. Friedman on the null hypothesis goes to the heart of the "Is it safe?" issue. I suggest, though, that since we cannot prove a null we can never state there is no effect; we can only state the lowest dose to individuals in a population at which any effect on health has been observed with a given statistical confidence. We cannot assume that actual effects on health just drop to zero at all lower doses. Clearly, each radiation event in the body is physically damaging but the ultimate consequence of any particular initial ionization damage depends on many variables and their interactions. One event might lead to a stimulatory or hormetic outcome on some cellular process; another (or even the same one) may leave a residue of genomic damage that is a step along a path to malignancy. Further, radiation is just one component of the multitude of stressors to which our bodies are subject. Cellular processes are constantly buffeted by physical, chemical, and biological agents, the perturbations combining in some complex, chaotic fashion to shape our well-being. The role of one radiation event per cell per year (about an annual dose of 1 mSv from gamma radiation) in this melange seems impossible to predict. It is certainly small, may be zero, and there may sometimes even be stimulatory effects as well. I consider such a dose safe.

## Comment on Book Review

*Ted Rockwell*
*Chevy Chase, Maryland*

My reaction to Dean Warren's book (*The Bomb and Its Deadly Shadow*) was somewhat like your reviewer's *(Health Physics Newsletter*, April 2005, p 7). The reader could conclude that Warren found the subject of radiation inherently fearful. But I am not surprised that the author stated that this was not his intention. It's a matter of context. In the earliest days of the atomic era, Stafford Warren was responsible for protecting people who knew little about radiation. They had been taught to face gunfire and bombs and resisted the idea that radiation was fearsome. Warren's authority rested on his ability to teach people that they could be seriously hurt if they didn't pay attention to him, even when their own eyes showed them nothing to be afraid of.

Admiral Rickover faced the same problem with the Navy—a strong feeling of "we already know how to handle dangerous situations." Even K.Z. Morgan advised him to set a 200 rem operating limit for submarine sailors, since they were warriors on dangerous missions. Later, both Rickover and Stafford Warren had to deal with the extreme radiophobia that arose when fear mongering became the common way to deal with radiation. By then, K.Z. Morgan was testifying in court that even the trivial doses permitted under civilian regulations should be reduced.

Another pioneer, Ralph Lapp, faced this same problem. When he complained of the casual attitude toward radiation protection for the open-air weapons tests, he was denounced as a fear monger. But when he later criticized those who claimed that no amount of radiation was harmless, he was assailed for having "changed his mind." He had not. He consistently pointed out the truth, as restated as recently as NCRP-136 (NCRP 2001): that large doses of radiation can be harmful and small doses are not harmful and, in most cases, are beneficial. "The dose makes the poison" (Paracelsus, 1540).

In science, numbers are crucial; in radiation protection, they are everything.

**Reference**

National Council on Radiation Protection and Measurements. Evaluation of the linear-nonthreshold dose-response model for ionizing radiation. Bethesda, MD: NCRP; NCRP Report No. 136, p 6; 2001.

# Chapter News

## North Central Chapter

*Mike Lewandowski, CHP*

### Science Teacher Workshop

On 30 October 2004, the North Central Chapter provided a Science Teacher Workshop at the annual meeting of the Wisconsin Association of Physics Teachers. Ten teachers and one college student training to become a physics teacher attended the workshop. Dan Miron provided an introduction to radiation and radioactivity to kick off the workshop. Marc Martz punctuated his presentation on environmental radiation with a cloud chamber demonstration. Duane Hall capitalized upon his career experiences and discussed industrial uses of radiation, including food irradiation. Mike Lewandowski provided a cursory introduction to nuclear power and radioactive waste. Kimberly Knight-Wiegert took the participants through a tour of radiation resources on the Internet. Other topics touched on during the workshop included radiation detection, health effects, radiation safety, and the profession of health physics.

**Mike Lewandowski and Duane Hall**

A highlight of the workshop was the presentation of each participant with a surplus civil-defense Geiger counter, a lantern mantle radiation source, and a set of simple experiments that can be used in the classroom to demonstrate the basic concepts of detection, distance, and shielding. Participants had an opportunity during the workshop to use their survey instruments to detect radiation from several natural sources and common consumer products as well as to try out the written experiments. In addition to the survey instrument, participants received a three-ring binder with presentation handouts, reference materials, and a CD-ROM containing additional reference material provided by the National Safety Council, the US Environmental Protection Agency, and the US Department of Energy.

This was the first Science Teacher Workshop produced by the North Central Chapter and it was used to pilot several different workshop components, including use of the chapter Web site to facilitate development of the workshop materials since the instructors were distributed across Minnesota and Wisconsin. The chapter Web site (http://hps1.org/chapters/ncc/) was revised to add a page of links to radiation-related Web sites for science teachers. Feedback from the participants was very supportive and provided important guidance for the chapter in developing future workshops.

## Western New York Chapter

*John T. Pavel, CHP*

The Western New York Chapter of the Health Physics Society (HPS) held its Spring 2005 meeting at Kodak Park in Rochester, New York, on 15 April. The meeting was sponsored by Global Dosimetry Solutions, Inc.

Speakers were Richard Harvey (University of Buffalo) presenting "Uncertainty of Inhalation Dose Coefficients for Representative Physical and Chemical Forms of Iodine-131," Jeffrey Slawson (University of Buffalo) presenting "University of Buffalo Radiation Safety Program and Research Reactor Decommissioning," and Donald Sherman (University of Buffalo) presenting "MicroPET at the University of Buffalo."


**Attending the Spring 2005 meeting of the Western New York Chapter HPS were (left to right) Joseph Greco of Kodak, Chapter President and speaker Richard Harvey, speaker Donald Sherman, Danielle Schmid of Global Dosimetry, speaker Jeffrey Slawson, and Victoria Potuck of Global Dosimetry.**

Health physics professionals in western New York State (Buffalo to Rochester to Syracuse) should contact one of the chapter's officers to participate in our professional activities—President Richard Harvey (Richard.Harvey@RoswellPark.org), President-elect Jamie Prowse (James.Prowse@ShawGRP.com), Secretary Debra Koch (Debra.Koch@viaHealth. org), or Treasurer and Past President John Pavel (PavelJ@usadatanet.net).

## New England Chapter
## Northeastern New York Chapter

*Margaret E. McCarthy*

Margaret E. McCarthy, immediate past president of the New England Chapter of the Health Physics Society (HPS), with John Sowa from the Northeastern New York Chapter HPS, as the speaker contact person, brought together HPS members from the states of Maine, Massachusetts, Connecticut, New Hampshire, and New York. These two chapters sponsored an all-day Transportation of Radioactive Materials (US Department of Transportation 49 CFR) training program. The course was taught on the lovely Massachusetts Arbor Day Friday, 29 April 2005, on the historical grounds of Springfield Technical Community College, Springfield, Massachusetts, overlooking the Springfield Armory Museum. The historic brick buildings and the best example of brick historic horse stables on 10 acres are surrounded by a fence cast from the cannons of the War of 1812.

The presenter was Roy A. Parker. Roy flew up from Baton Rouge, Louisiana, specifically for this course. Roy has been the radiation physics consultant to major clients in transportation, medicine, industry, and academia and, in particular, Federal Express for more than 27 years. He is a charter member of the HPS.

The course was well received in content and presentation. The lectures were followed by detailed exercises on marking, labeling, and packaging. There were discussions for specific cases for compliance. Some attendees were radiation safety officers (RSOs) from the medical arena. Baystate Medical Center is the second largest in New England and sent a large contingent from medical physics. University RSOs were present as well as research academia and the military.

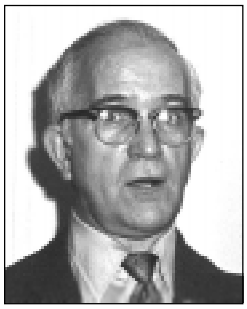
Sponsoring joint meetings increases the contact between the chapters. As coordinator for this event, I happened upon new members to the area who had seen the advertisements. Subsequently, I sent the contact information to the respective chapter. The Connecticut Chapter of the HPS sent its officers. Also a general question to the audience for continuing education credits gave forth three different societies in addition to the HPS. Good idea to have that question on the registration form first. I did tout the HPS as number one by color coordinating the dessert Jello™ in magenta and yellow.

# Notes

## Charles L. Weaver
## 1919-2005

*John C. Villforth, CHP*

Charles "Chuck" Weaver, a former health physicist in the US Public Health Service (USPHS), died at his home in Kensington, Maryland, on 17 March 2005 at age 86 as a result of complications from Parkinson's disease.



Chuck joined the US Army in 1940 after graduating from the University of Maine and served in the Pacific during World War II. Later in his Army career, he received a master's degree in radiobiology from the University of California at Berkeley. He maintained his radiation interest when in 1961 he was assigned by the Army to Albuquerque as radiation safety officer in the former Atomic Energy Commission's office of weapons test operations.

In 1962 he transferred from the Army to the Commissioned Corps of the USPHS and was assigned to the Division (later Bureau) of Radiological Health in Rockville, Maryland, in the program involved with radiation safety and environmental impact of nuclear facilities. He headed the Division of Environmental Radiation and was responsible for overseeing such activities as exposure assessment from nuclear fuel plants and the national reactor surveillance network, the study of reactors as a source of environmental radioactivity, and the operation of the various radiation alert networks such as the Tritium Surveillance System. Many of these programs involved the collaboration with the state radiation control programs and Chuck was supportive of the state's interests and participated directly with such states as Kentucky on radioactive disposal projects.

In 1971 when the Environmental Protection Agency (EPA) was formed from the environmental programs in the USPHS, Chuck and 45 staff members were assigned to EPA. There he became the director of the newly formed Division of Environmental Surveillance and Inspection.

He continued his responsibilities for overseeing these environmental radiation activities in EPA until his retirement from the government in 1977 with the rank of Captain in the USPHS. After retirement he did consulting work for Teknekron, Inc., until 1981.

Captain Weaver was known for his mentoring of younger USPHS officers and encouraging them on to a career in health physics and radiological health. He was well respected as a leader in radiation protection and was awarded the USPHS Meritorious Service Medal.

He lived in the Washington, DC, area from 1967 until his death and was a member of the St. Paul's Methodist Church in Kensington, Maryland.

He is survived by his wife, Alice, whom he married in 1942, five children, and 14 grandchildren.

## Matthew Lyon
## 1933-2005

*Jerome B. Martin, CHP*

Matthew Lyon, a 20-year resident of Richland, Washington, died on 14 April 2005 after a brief illness. He was born on 4 May 1933 in Mineola, New York. After his discharge from the US Navy in 1954, Matt began his career in health physics as a radiation protection technician at the GE Vallecitos Nuclear Laboratory. While working full-time to support his wife and three children, Matt completed his BS degree at San Jose State College in 1965. Matt spent the next two decades working in the nuclear power industry. From 1967 to 1971, he was the first health physicist at the Point Beach Nuclear Plant where he designed and developed the radiation protection and environmental monitoring programs. This was followed by a five-year stint at the Browns Ferry Nuclear Plant where he once again was the first health physicist and designed and implemented the radiation protection program.

In keeping with his tradition of being among the first health physicists on a project, Matt was hired in 1976 by Puget Sound Power & Light and Northwest Energy Services to be the Health Physics and Chemistry Manager at the Skagit Nuclear Power Project. In 1982, Matt transferred to the Washington Public Power Supply

System and continued work on the WNP-3 Plant at Skagit. In 1984, Matt joined the staff of American Nuclear Insurers where he was responsible for inspection and evaluation of the radiation protection programs at nuclear power plants for liability insurance compliance. The following year he returned to the Washington Public Power Supply System as a Principal Health Physicist at the WNP-2 Nuclear Power Plant where he performed quality assurance audits and performance evaluations of radiation protection and radioactive waste programs. Matt completed his career in health physics at Battelle, Pacific Northwest National Laboratory, where he worked from 1987 until his retirement in 1999 as manager of the Hanford Radiological Records Program.

During his years at Battelle, he modernized and upgraded the Hanford site-wide radiation records system and gained a national reputation for his expertise with respect to radiation records, serving as chairman of American National Standards Institute (ANSI) Committee N13.6 that produced the standard "Practice for Occupational Radiation Exposure Records Systems."

Matt was a member of both the national Health Physics Society and the Columbia Chapter. He served as secretary of American Nuclear Society, Subcommittee 3 that prepared ANSI Standard N18.1 on Selection and Training of Nuclear Power Plant Personnel and was also a member of the Atomic Industrial Forum Subcommittee on Occupational Radiation Exposure.

He will be missed by his many friends and colleagues in health physics and by his wife of more than 50 years, Judy, and three children.

## Teachers, Health Physicists, and Dear Abby



**DEAR ABBY:** You printed a letter from a student who received detention for "respectfully disagreeing" with her teacher during a discussion of world events. In your reply, you suggested that the writer's comment may have been "disruptive," justifying the detention, and advised that it would have been more "diplomatic" to have voiced the disagreement in private. I take exception to your answer.

I am semi-retired now, but as a manager I had tremendous difficulty convincing subordinates that it was not only safe to disagree with me, but that I needed their frank opinions. I trace this to a situation described by John Holt in his 1964 book, "How Children Fail," in which he points out that the education system kills creativity, teaching students to anticipate what the teacher wants to hear and to feed it back to him/her.

I am currently co-director of the Master's in Health Physics Program at the Illinois Institute of Technology, engaged in the training of radiation safety professionals. It is essential that a safety professional be prepared to challenge his/her management when it proposes to do something that's contrary to law or regulation, or prejudicial to safe operation. The type of education described by Holt produces individuals who go along with management no matter what is proposed.

It is despicable that a teacher would conduct a "discussion" in which she entertains only opinions that agree with her own and punishes those that don't. The result for the students and our country is tragic. You should have supported the student. — Laurence F. Friedman, PH.D.

**DEAR DR. FRIEDMAN:** You're right; I should have. And thousands of readers wrote to tell me so. (The e-mails, when printed out, weighed more than 15 pounds.)

# NCRP

## Managing the Disposition of Low-Activity Radioactive Materials

Forty-First Annual Meeting of the NCRP, 30-31 March 2005

The inconsistency of US regulations for radioactive waste, especially for low-activity waste, was one of the major themes at the National Council on Radiation Protection and Measurements (NCRP) Annual Meeting, 30-31 March 2005 in Arlington, Virginia, according to John F. Ahearne, meeting rapporteur. Dr. Ahearne, NCRP Council Member, pointed out that the speakers described these regulations as patchwork which are not risk-informed and which need to be changed. Another important theme of the meeting, he said, was that "users of scrap metal are particularly affected, primarily because of the difficulty of reconciling in a regulatory framework the 'residual risk' with the 'residual liability' for release and subsequent possession of the material."

In his welcoming remarks for the Forty-First Annual Meeting, "Managing the Disposition of Low-Activity Radioactive Materials," NCRP President Tom Tenforde mentioned the great interest that had been shown in NCRP Report No. 141, "Managing Potentially Radioactive Scrap Metal," published in 2002. He said that the intent of this year's meeting was to broaden the discussion of this topic to include all types of low-activity radioactive materials.

**Tom Tenforde**

Dr. Tenforde added that the meeting was designed to bring together representatives of the relevant stakeholder groups including federal and state regulators, the nuclear industry, commercial industries involved in the disposal and/or recycling of low-activity materials, and public interest groups. A primary goal of the meeting, he said, was to foster discussion of the differing views held by the various stakeholder groups and to promote a dialogue on unresolved issues in developing an acceptable national strategy for the disposal and/or recycling of slightly radioactive or nonradioactive materials. The importance of developing this strategy is underscored by the large quantities of such materials that will be generated through the decommissioning of many nuclear facilities during the coming decades.

S.Y. Chen, chair of NCRP Report No. 141, was the Program Committee chair for this year's meeting. Members of the committee were William P. Dornsife, Susan M. Langhorst, Jill A. Lipoti, Joel O. Lubenau, Ruth E. McBurney, Dade W. Moeller, Carl J. Paperiello, Michael T. Ryan, and Susan D. Wiltshire.

Titles, speakers, and short abstracts of presentations follow:

### Second Annual Warren K. Sinclair Keynote Address

**Contemporary Issues in Risk-Informed Decision Making on the Disposition of Radioactive Waste**
*B. John Garrick*

A consistent and transparent risk-informed approach to managing nuclear waste is plagued with different regulators, different rules and regulations for different waste types, different compliance requirements, and indecisions about probabilistic versus deterministic risk assessment methods. Management of low-activity waste is particularly void of a path forward with respect to being risk-informed. A positive step forward would be congressional action or regulatory rulemaking against a background of Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) policies on being risk informed and the adoption by the radiation technologies community of a more general and unified approach to risk assessment applicable to all types of waste. The result would be a more quantitative basis for identifying simpler, safer, and much less costly alternatives for low-activity waste disposal while enabling society to have the full benefit of radiation technologies.

### Managing Low-Activity Radioactive Materials—Challenges and Issues

*Ruth E. McBurney and Michael T. Ryan*
*Session Cochairs*

**Improving the Regulation and Management of Low-Activity Radioactive Wastes**
*Michael T. Ryan*

This paper summarized the first phase of a study by a committee of the National Academies of Science Board on Radioactive Waste Management. The study was initiated after it was observed that statutes and regulations administered by the federal and state agencies that control low-activity radioactive wastes have developed as a patchwork over almost 60 years and usually reflect the enterprise or process that produced the waste rather than the waste's radiological hazard. Inconsistencies in the regulatory patchwork or

its application may have led to overly restrictive controls for some low-activity wastes but the relative neglect of others. In the first phase of this study, the committee reviewed current low-activity waste inventories, regulations, and management practices. This led the committee to develop five categories that encompass the spectrum of low-activity wastes and serve to illustrate gaps and inconsistencies in current regulations and management practices.

**Risk-Informed Radioactive Waste Classification and Reclassification**

*Allen G. Croff*

Radioactive waste classification systems allow wastes having similar hazards to be grouped for purposes of storage, treatment, transportation, and/or disposal. As recommended in NCRP Report No. 139, "Risk-Based Classification of Radioactive and Hazardous Chemical Wastes," a preferred classification system would be based primarily on the health risks to the public that arise from waste disposal and secondarily on other factors, that is, the system would be risk informed. The current US radioactive waste classification system is not risk informed because (a) key definitions are based on the source of the waste instead of its inherent characteristics related to risk and (b) there is no general provision for exempting materials from being classified as radioactive waste which would then allow management without regard to their radioactivity. The potential ramifications of the waste classification system not being risk informed are increased risks and costs because wastes are managed inefficiently and the creation of orphan wastes. Some solutions to the shortcomings of the current waste classification system are under development but the extent to which they will be risk informed is not yet clear.

**Managing Disposition of Potentially Radioactive Scrap Metal**

*S.Y. Chen*

In 2002, the NCRP issued Report No. 141, "Managing Potentially Radioactive Scrap Metal." The report evaluates management policy issues regarding scrap metal generated in regulated facilities that have radiological concerns. This particular issue has arisen because of the increased number of such facilities that have undergone (or will undergo) the decommissioning process and will be dismantled. Because of the lack of a consistent disposition policy and systematic regulatory provisions, effective management of such materials is still unattainable today. The potential consequences of this lack of policy have added considerable economic burdens to the facility operators and may have caused undue delays in the massive cleanup effort of the nation's nuclear weapons complex. However, a number of intricate issues, including waste management and environmental radiation health and safety, as well as concerns by stakeholders, remain as potential challenges toward the disposition of such materials.

## International Policies and Practices

*Joel O. Lubenau, Session Chair*

**International Standards Related to the Classification and Deregulation of Radioactive Waste**

*Gordon Linsley*

Although solid radioactive waste management is mainly a national concern, there are some aspects that have international implications. An example of a practice that would have international implications is the movement of radioactive waste between countries. The decommissioning of nuclear facilities results in the release of materials that could be reused and recycled and it is possible that they could enter into international trade, especially if the material were a metal. It is clearly desirable, therefore, to have appropriate international standards to help regulate that trade. This paper described recent international developments relating to the establishment of radiological criteria for the release of materials from regulatory control (clearance). There have already been some experiences of clearance and the transfer of recycled materials within Europe and this paper reviewed that experience. It also discussed recent developments in relation to the international classification of radioactive waste.

**Spanish Protocol for Radiological Surveillance of Metal Recycling: A Collaboration of Government and Industry**

*Juan Pedro Garcia Cadierno*

The presence of radioactive materials in scrap has been detected relatively often in recent years. This fact has led to the start of a set of measurements dedicated to preventing these events. The incident that occurred in a Spanish steel factory in 1998 was the reason for establishing the Spanish Protocol by national authorities, the involved private companies, and the main trade unions. The protocol was signed in 1999. It defines the radiological surveillance of the metallic scrap and its products, along with the duties and the rights of all signed parts. From the date of the signature to December 2004, 461 pieces (sources and contaminated materials) have been detected. The number of subscribing companies is 90 and four incidents have occurred since the signing of the protocol.

## US Experiences in Managing Low-Activity Radioactive Materials

*Jill A. Lipoti, Session Chair*

### Current Radioactive Waste Disposal Industry Conditions and Trends

*Stephen Romano*

The nation is presently served by full-service Class A, B, and C low-level waste (LLW) and naturally occurring or accelerator-produced material sites in Washington and South Carolina; a Class A and mixed-waste disposal site in Utah that also accepts NARM; and hazardous waste and uranium mill tailings sites that accept certain non-NRC regulated waste. The Washington site disposes of NARM nationally, but only accepts LLW from 11 states due to interstate Compact restrictions. The Utah site dominates the commercial Class A and mixed-waste disposal market due to lower state fees. To expand existing services, a west Texas hazardous-waste site is seeking Class A, B, and C and mixed-waste disposal authority. With that exception, no new Compact facilities are proposed. This fluid, uncertain situation has inspired rulemaking work, national studies, and congressional inquiries into future disposal access.

### Scrap Metals Industry Perspective on Radioactive Materials

*C. Ray Turner*

This paper discussed the numbers and costs of contamination meltings worldwide. It pointed out that the risk is increasing and that there is a need for regulations requiring detectors at import and export facilities; a need for better locating, reporting, and tracking; and a need for better disposal systems.

### Radioactive Metal Processing Industry Perspective

*Al Johnson*

A perspective was given on the current US economic environment for the disposition of radioactive materials, including very low-activity metals. Generators are motivated to save money and to reduce their liability. The general public perceives anything associated with radioactivity as dangerous. The current situation is that the US Department of Energy (DOE) and commercial nuclear generators are producing more radioactive waste, including metal and building rubble debris. Low disposal costs and readily available disposal space are the reasons that we are not processing and recycling more metal from radioactive licensed facilities. Conclusions: (1) The use of a licensed steel mill for clearing scrap metal for recycling provides a specific example of a disposition process that has been successfully implemented over the past 10 years in the United States. This metal melting and casting operation provides an outlet for the beneficial reuse of radioactive metals that are kept within licensed control, (2) The feasibility of expanding the program to include a full-fledged clearing house for metal recycling, including the destruction of certain classified metal shapes, should be evaluated along with the long-term cost and benefits of the process, (3) The current business model for recycling radioactive metals for beneficial and controlled reuse is driven by burial cost avoidance and risk management.

### Formulation of Future Nuclear Waste Public Policy in America

*Douglas Tonkay*

A map was presented showing the large number of DOE waste generator and disposal sites in 18 states. The current DOE environmental waste management policy was described as:

- Low-level waste—dispose of on site or at another DOE site or at a commercial facility if that would be cost effective.
- Transuranic (TRU) waste—use the Waste Isolation Pilot Plant for defense. For nondefense TRU waste, use safe storage and wait.
- High-level waste and spent nuclear fuel—use safe storage and wait.

Three factors for consideration in optimizing waste disposal decisions were listed: (1) health and environmental risk, (2) complete site cleanup and reduce active management of waste and excess materials, and (3) cost.

### Nuclear Industry Experience with Safe Disposition of Low-Activity Radioactive Materials

*Ralph Andersen*

NRC regulations provide a method for licensees to apply to the Commission for case-by-case approval to dispose of specified types and quantities of licensed radioactive material in a manner not already authorized in the current regulations. Since 1983, more than 80 such applications have been submitted by licensees and a majority of these have been approved and safely implemented.

This paper included a summary of experience and insights gained from a review of reactor licensee applications for approval of specific disposal alternatives. The paper also included a review of three cases that helps illustrate approaches that might be considered for generic rulemaking. Recommendations were made regarding how the review process for disposal requests might be made more effective and efficient in the future.

## Formulating Tomorrow's Public Policy

*Susan D. Wiltshire, Session Chair*

**Formulation of Future Nuclear Waste Public Policy in America**

*David H. LeRoy*

There is tension between the public and public policy, and all things nuclear have contributed "mightily" to major improvements in US lifestyle. Government by popularly elected officials serving two-, four-, or six-year terms is ill-designed to create and implement policy that controls highly unpopular and long-lived nuclear wastes. The next political cycle in America will demand that elected officials face the need for solutions for nuclear waste policy, but this is not an optimistic situation. The past month was a bad one for Yucca Mountain. There will be no more grand designs by Congress but occasional narrow amendments. Some positive steps by regulators and by states may be upcoming.

**Low-Activity Waste Management—An Analysis of Public-Interest Group Positions**

*H. Keith Florig*

Rationales were described which underlie public-interest group positions on the disposition of LLW. Public-interest groups' objections to proposed recycling and disposal initiatives are made on fairness, risk assessment, and energy-policy grounds. Concerns about procedural fairness stem from the continuing use of expert-driven, rather than deliberative, systems for LLW policy making. Concerns about distributional fairness arise because the benefits and risks of proposed LLW policies accrue to different stakeholders. Risk assessment is faulted for failure to acknowledge hidden subjective assumptions (for example, on screening vigilance in materials recycling, on integrity of disposal facilities in the far future). Skepticism of technological risk management arises from a history peppered with unexpected untoward events that lay outside of the design bases used to create protection systems. Finally, public-interest groups view LLW issues as part of a larger debate on wise and legitimate energy policy and are reluctant to support measures that provide relief to a nuclear industry that, in their view, established itself outside the democratic process.

**Policy Development from the Industry Perspective**

*William P. Dornsife*

The major burden for the implementation of any option for disposition of low-activity radioactive waste will fall to the industries that generate the waste and provide waste-management services. Perhaps the most important issue confronting industry is the public concern and opposition that will likely occur to almost any proposed solution.

Another important issue is the multiple and sometimes conflicting government agency jurisdiction, regulation, and policy that now exist and will likely continue in the implementation of new options. This over-burdensome regulatory structure may lead to industry hesitation to participate in the proposed solutions.

Since there is a system currently in place for disposition of some low-activity radioactive materials, there is industry concern that new proposals may jeopardize the existing system. The other related concern is how to transition to a new system, since the current system must remain in place to continue to provide the limited solutions.

There are conflicts between the interests of various industry groups. There are strong industry interest groups that inhibit wider solutions for certain categories of waste because current regulations favor them or because some solutions are viewed to cause economic harm.

For the generating facility there are issues relating to the control and transfer of materials leaving licensed facilities. For the waste-management industry additional monitoring, design, and long-term care for disposal facilities will need to be considered.

## Update of Regulatory Efforts and Round Table Discussion

*Susan M. Langhorst, Session Chair*

**Overview of US Environmental Protection Agency's Initiative on Disposition of Low-Activity Waste**

*Daniel J. Schultheisz*

The EPA issued an Advance Notice of Proposed Rulemaking (68 FR 65120, 18 November 2003) to address disposal of radioactive waste with low concentrations of radioactivity ("low-activity"). Radioactive waste disposal in the United States is typically regulated by the origin or statutory definition of the waste, rather than radionuclide content. Some wastes that are inconsistently regulated can present higher risks to the public than wastes that are more tightly controlled. The current system provides limited disposal options and can lead to other systemic inefficiencies. It may be possible to improve the system by identifying disposal options appropriate for the hazard of the waste in question. EPA's Advance Notice of Proposed Rulemaking focuses on the potential use, with appropriate conditions, of permitted hazardous waste landfills for such wastes. EPA received more than 1,500 public comments. EPA

continues to analyze the comments and to interact with stakeholders to determine the most appropriate action.

**Update of Regulatory Efforts by US Nuclear Regulatory Commission**

*Carl J. Paperiello*

The history was described of the NRC's approach to developing regulations for the disposition of solid materials. An issues paper in 1999 and public meetings led to a Commission decision to ask for a National Research Council study. This study recommended incorporating broad-based stakeholder participation, use of a dose-based standard with 10 μSv/yr as a good starting point, and that the NRC follow international efforts. Comments were given on Safety Guide RS-G-1.7.

**Implementation of US Department of Energy Policies, Directives, and Guidance for Radiological Control and Release of Property**

*Andrew Wallo, III*

The DOE objective was described for radiation protection of the public and the environment to be able to maintain doses as far below dose limits and constraints as low as reasonably achievable (ALARA). A DOE order was outlined that provides DOE requirements, including specific requirements for controlling and releasing property. The ALARA dose constraint for release of real property is 25 mrem/yr, with a goal of a few mrem/yr. For personal property the constraint is <1 mrem/yr. Improvements in setting priorities are desirable, but not urgent, since the current property control and release system works.

**Role of State Regulatory Agencies in the Disposition of Low-Activity Radioactive Materials**

*Edgar D. Bailey*

The important role of state regulatory agencies was addressed. Six original low-level radioactive waste sites were listed. Not all are now functioning. Of the three longer-operating sites one has closed. The role of the NRC, the EPA, and three states (Texas, Pennsylvania, and California) was discussed. Questions were posed about future actions of states.

**Twenty-Ninth Lauriston S. Taylor Lecture on Radiation Protection and Measurements**

This highlight of the meeting was held on Wednesday evening with the introduction of the lecturer by Dr. R. J. Michael Fry. John B. Little, Harvard University School of Public Health, was honored as the lecturer. His talk, "Nontargeted Effects of Radiation: Implications for Low-Dose Exposures," was followed by a reception in honor of the lecturer.

**John B. Little (center) is shown with five of his former students (left to right) Ann R. Kennedy, Sally A. Amundsen, Andrew J. Grosovsky, Noelle F. Metting, and Amy Kronenberg.**

Another highlight of this year's meeting was a special tribute to the founder and first President of NCRP, Lauriston S. Taylor, that was presented on behalf of NCRP by Robert O. Gorson. Dr. Taylor served as chairman of NCRP's predecessor organizations beginning in 1929 and as president from 1964, when NCRP was chartered by the US Congress under Public Law 88-376, until his retirement in 1977. He died on 26 November 2004, at the age of 102. The presentation by Robert Gorson traced Taylor's life history, from early childhood onward, and summarized his many scientific accomplishments and extensive service to the nation and to scientific committees and organizations concerned with radiation measurements and protection worldwide. The slides from this presentation can be viewed on the NCRP Web site (http://www.NCRPonline.org).

**Lauriston Taylor's son Nelson (left) and grandson Gary are shown at the Annual NCRP Members' Dinner.**

The complete talks given at the meeting will be published in a future issue of *Health Physics*. Photos from the meeting can be seen at http://www.NCRPonline.org. Electronic copies (PDFs) of the presentations can be purchased online at http://www.NCRPpublications.org for $10.00.

# HPS Standards Corner

## Radiation Protection Standards and the Health Physics Society

*Joseph P. Ring, CHP, N13 Chair*

The Health Physics Society (HPS) and its members are very involved in developing radiation protection standards through two American National Standards Institute (ANSI) Committees, N13 and N43. Although this article specifically discusses the N13 development process, N43 uses a very similar process. Increasingly, government agencies look to standards-setting bodies for standards as required by the Office of Management and Budget (OMB) Circular A-119 "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities." This circular mandates that government agencies use independent standards instead of developing internal requirements whenever possible. To meet this need a standard developer needs to produce a standard that represents best management practices, is completed in a short time frame, and is defensible. Historically, the HPS standards process was overly complicated and time consuming. To meet the needs of both the regulators and its members, the HPS has worked with its committees to simplify standards development.

Under the old system, the HPS Standards Committee (HPSSC) developed a standard. Once it was approved by HPSSC, the standard was proposed to N13. This meant that a proposed standard went through two independent approval processes that could, at times, take years. If the standard was not approved by N13, it was returned to HPSSC for redrafting and reballotting. Standards development under this program was difficult for those writing the standard and did not meet the needs of the HPS.

To streamline the development process and make it easier to complete an ANSI Standard, the HPS revised its development and approval process. Under these new rules, all approval authority rests with a single committee, N13. N13 is responsible for approving a proposed standard-development activity, approving the members and chair of the working group developing the standard, and reviewing and approving the final document before recommending it to ANSI as an American National Standard. When the standards-development process moved to N13, the HPSSC section managers were transferred to N13. The section managers, listed in Table 1, are responsible for managing the development and reapproval of N13 standards within five technical disciplines.

**Table 1**
**N13 Section Managers**

| Section | Manager |
|---|---|
| Environmental | Mark Somerville |
| External Dosimetry | Bob Devine |
| Internal Dosimetry | Don Bihl |
| Instrumentation | Michelle Johnson |
| Medical | Rob Forrest |

**What is ANSI N13?**

The HPS is the Secretariat for ANSI Accredited Standards Committee (ASC) N13. ASC N13 develops and maintains radiation protection standards, where radiation protection is defined as the protection of individuals or groups from occupational or environmental exposure to radiation or radioactive materials. ASC N13 is subject to rules defined in its Standards Operating Procedures that are approved by ANSI and not the HPS. N13 is not an HPS Committee, but most members are also HPS members.

N13 is an ANSI consensus committee, which means its membership represents a variety of interests in radiation protection with no one group holding a controlling majority. There are 27 N13 members representing labor and professional organizations, companies, and government agencies. An additional six are individual members due to their acknowledged expertise or leadership in radiation protection. All 33 members have a direct and material interest in radiation protection. These organizations and individuals vote to approve a draft standard and coordinate the development, revision, and reaffirmation of standards within the committee's scope. One of the advantages of this membership is the depth of viewpoints and long-term service. The members who approve a standard's

development are often the same members who approve the standard and its later revision.

As a result of reorganizing the standards development into N13, the HPS has one vote on N13 activities. This vote is assigned to the HPSSC, which ballots the proposed standard by its own procedures. The ballot is submitted to N13 and carries the same weight as a vote from any of the other 33 members. This change improves the N13 consensus process and ensures that all members have equal standing on the committee.

### Starting and Writing an ANSI Standard

Anyone can request development of an ANSI Standard. To initiate the process, the proponent would complete a Project Initiation and Notification System Form (PINS) that can be downloaded from the HPS Members Only Standards Web site. This document specifies the scope of the standard and the writing group chair. The PINS form purpose is to gain the support of N13 members and to notify other ANSI committees and the public of our intention to develop a specific standard as outlined in Figure 1. N13 members consider whether the proposed standard is necessary, what it would require, and the representation of affected communities on the writing group. With an authorization from N13, a writing group (WG) is charged with the development of the ANSI Standard. The WG is a group of experts in the subject who represent the technical and affected communities and are charged with creating a document that represents the best management practices.

Once a WG completes a draft standard, it is submitted to N13 for balloting. The N13 members are responsible for soliciting comment from the organization they represent and submitting one vote on behalf of the organization. This method ensures consideration of many varied viewpoints and strengthens the quality of the standards. N13 strives for a unanimous approval for all standards before proposing the document as an ANSI Standard. As a result, there is often discussion between the WG and N13 members which often results in revisions to the document. Revisions that result in a change in technical content are returned to the entire committee for reconsideration. If a negative ballot cannot be resolved between the N13 member and the WG, it is possible for N13 to approve a standard with one or more negative votes. While N13 has never approved a standard with a negative ballot, it is possible to approve such a standard by notifying members of the specific reasons for the negative vote(s) and reballotting the standard.

After a standard has been approved by N13, it is forwarded to the ANSI where notice is published in Standard Action for a 60-day public comment period. Public comments are referred to the WG for resolution. After resolution of comments, the document is published as an ANSI/HPS Standard and is available to members free of charge on the HPS Members Only Web site.

### Standards Availability

Standards approved and published in this program under an HPS copyright are available to HPS members as a membership benefit. There are, however, a number of N13 Standards that were published before this organizational change and ANSI owns the copyright. These Standards are currently being revised and when reaffirmed, they will be published as ANSI/HPS Standards and will be available on the HPS Members Only Web site.

### Current Efforts

With a current inventory of over 50 pending and draft ANSI N13 Standards, there is always an opportunity for volunteers. To stay current, standards need constant attention. The needs of the community and technical requirements change so existing standards need to be reviewed and reapproved every five years. There is also a continuous need for new standards. Examples of these efforts are Internal Dosimetry for Plutonium (N13.25), Fetal Dose Calculations for Nuclear Medicine (N13.54), Guidance for First Responders in Radiological Dispersal Device Events (N13.58), and Dose Reconstruction. In addition to developing new ANSI Standards, N13 reviews existing N13 Standards on a five-year cycle.

If you are interested in initiating a standard or participating on a WG, please contact me or one of the section managers.

**Health Physics Society Standards Committee**
http://hps.org/aboutthesociety/organization/committees/committee24.html

**N13 Radiation Protection Committee**
http://hps.org/aboutthesociety/organization/committees/ansicommittee1.html

**N13 Radiation Protection Committee Chair**
Joseph P. Ring (joseph_ring@harvard.edu)

The Display Ads, Short Course listings, and Placement Center are available in the hard-copy version of Health Physics News.



***Health Physics News* Contributions and Deadline**
Almost everything the Managing Editor receives by 20 June will be printed in the August issue.



**HPS Reference Library:** http://www.min.uc.edu/nuclear/hpspep/peplib.html

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**HPS Home Page URL:** http://www.hps.org

**Article II, Section 1, of the Bylaws of the Health Physics Society declares: "The Society is a professional organization dedicated to the development, dissemination, and application of both the scientific knowledge of, and the practical means for, radiation safety. The objective of the Society is the protection of people and the environment from unnecessary exposure to radiation. The Society is thus concerned with understanding, evaluating, and controlling the risks from radiation exposure relative to the benefits derived." *Health Physics News* is intended as a medium for the exchange of information between members. *Health Physics News* is published monthly and is distributed to the members of the Society as a benefit of membership. Subscriptions for nonmembers are available. Libraries, institutions, commercial firms, government agencies, and any person not eligible for membership may obtain a subscription. A small inventory of recent back issues is maintained by the Society at the Office of the Executive Secretary to supply copies to new members not yet on the mailing list. Inquiries about back copies and about subscriptions should be directed to the HPS Secretariat.**

***** CHANGE OF ADDRESS, PHONE, FAX, OR EMAIL INFORMATION *****

**If you have a change of address, phone or fax number, or email address you may now make those changes via the Health Physics Society (HPS) Web site (www.hps.org) in the Members Only section. The changes will be made to the Web site database and will also automatically be sent to the HPS Secretariat so that changes will be made on the Society database.**

**If you do not use the Internet make your changes through the HPS Secretariat.**
**Please make any changes or corrections BESIDE YOUR MAILING LABEL (on the reverse side of this notice).**
**If you have any change in your phone number, fax number, or email address, please note it near the label.**

# Odds and Ends from the Historical Archives

*Paul Frame*

## Mutant Golf Ball

A golf ball deformed by the ravages of radiation.


It was produced in the 1960s by Oak Ridge Atom Industries, Inc., of Oak Ridge, Tennessee. The bottom of the box that the ball came in noted that the company "owns and operates its own source of radioactive Cobalt-60 under AEC Byproduct License No. 41-2540-1."

The manufacturer claimed that the treatment with Co-60 gamma rays resulted in "longer drives . . . . longer lives." They also boasted that it was "the best (and most expensive) golf ball made in the USA."

It is possible that the irradiation changed the tension of the winding and that a nonuniform exposure caused the distorted shape. Just speculating.

# Upcoming Events

2005 HPS Summer School
"Operational Health Physics: Planning and Implementation"
5-8 July 2005
Gonzaga University
Spokane, Washington

50th Annual Meeting
of the Health Physics Society
http://hps.org/newsandevents/meetings/meeting4.html
10-14 July 2005
Doubletree Convention Center
Spokane, Washington

39th Health Physics Society
Midyear Topical Meeting
22-25 January 2006
Scottsdale, Arizona

51st Annual Meeting
of the Health Physics Society
http://hps.org/newsandevents/meetings/meeting5.html
25-29 June 2006
Westin Convention Center
Providence, Rhode Island

**HPS Web Site:** http://www.hps.org

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