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In This Issue

Meet President McBurney—story on page 17.

The Birth of the HPS: A Look Back

Forming the ABHP and Establishing the Prestige of Health Physics

Mary Walchuk

"The society went a long way toward establishing the prestige of Health Physics when it established the American Board of Health Physics, and gave to it the responsibility for evaluating applicants and certifying their qualifications as professional Health Physicists."—Walter D. Claus

On 29 October 1959 the Health Physics Society (HPS) formally established the American Board of Health Physics (ABHP) after studying and developing plans for a certification program since shortly after the Society's establishment in 1956. HPS member and 2005 McAdams award winner* Dade Moeller was serving as officer in charge of the Northeastern Radiological Health Laboratory in Massachusetts at the time and later served on the ABHP. Moeller takes us back to those years and the start of the ABHP.

Dade Moeller

Why did the HPS form a committee in 1956 to study the need for certification of health physicists?

Moeller: Although there are various ways to express it, I believe this task was accomplished most eloquently by Walter Claus who pointed out that, based on its constitution, one of the primary objectives of the HPS was "*to promote and improve Health Physics as a profession.*" He followed this by pointing out that you cannot accomplish this, or any of the other objectives of the Society "until you have established yourself, in your own mind and in the minds of your associates and the public, as a professional representative of a useful and honorable profession" (*Health Physics*, Vol. 8, pages 113-116, 1962).

What were some of the key dates in the formation of the ABHP?

Moeller: There were several. The first decisive event occurred within

(continued on page 2)

Forming the ABHP . . .

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a few months after the Society was established in 1956, when the Board of Directors appointed a committee to study the need for such a program. The members of this committee were G. Hoyt Whipple, Elda E. Anderson, Ardath H. Emmons, William A. McAdams, C. Maurice Patterson, F.D. Sowby, Lauriston S. Taylor, and Forest Western.

This was followed by the appointment of a temporary American Board of Health Physics (ABHP) in 1958, with members C. Maurice Patterson, William McAdams, Elda Anderson, Lauriston Taylor, and John W. Laughlin. One of the first actions of the temporary ABHP was to develop a set of minimum qualifications for certification, based on the professional backgrounds of 100 selected individuals believed to be representative of those people recognized as competent health physicists. The proposed set of minimum standards that followed were discussed by the HPS Board of Directors in 1959, and the Board formally established the ABHP by approving an amendment to the bylaws of the Society on 29 October 1959, only slightly more than three years after the Society was founded.

The eligibility requirements for certification were as follows: Applicants for certification must have a bachelor's degree in a physical science or in a biological science with a minor in the physical sciences. In exceptional cases, persons who have demonstrated adequate knowledge of health physics, but who are deficient in the formal requirements, may, at the discretion of the ABHP, be permitted to substitute experience for academic requirements. Each applicant must also be engaged in the professional practice of health physics a substantial portion of his/her time, and must have at least five years of responsible professional experience in health physics of which at least three years must be in applied radiation protection work. One year of graduate work in a field closely related to health physics may be substituted for a year of experience up to a maximum of three years.

In July 1961 the ABHP formally adopted a set of bylaws. These included the purposes and goals of the Board which were later amplified as follows:

1. To elevate the standards and advance the profession of health physics by encouraging its study and improving its practice,
2. To encourage and insist on the highest standards of professional ethics and integrity in the practice of health physics,
3. To determine the competence of specialists in health physics and to arrange, control, and conduct investigations to test the qualifications of voluntary candidates for certificates to be issued by the Board,
4. To grant and issue certificates in the field of health physics to voluntary applicants and to maintain a registry of holders of such certificates.

The Board received official recognition when it was incorporated in New York on 1 December 1960. Interestingly, the ABHP was the first private group granted permission by that state to license or certify professional people. Incorporation was particularly important at that time because it documented the fact that the ABHP was an official entity and that its activities were legitimate.

Who were some of the 100 selected individuals and what role did they subsequently play?

Moeller: They included people such as Lauriston Taylor, the leaders within the radiation protection programs at the various National Laboratories—such as K. Z. Morgan, Elda Anderson, Fred Cowan, Maurice Patterson, Jack Healy—plus others such as William McAdams and John Laughlin. The last person, in particular, is of interest, since his selection reflected the interest of the ABHP in recognizing radiation protection specialists outside the nuclear energy field, particularly those who were involved in medical physics. In fact, the American Association of Physicists in Medicine became a sponsor of the ABHP in 1966.

Did the "100" gain any benefits from having been identified as being qualified?

Moeller: Yes, they were invited to be granted certification without examination. Around 80 of the 100 accepted this invitation; 159 additional applicants were certified without examination, based on a point-system evaluation. Certification without examination ended in December 1961 and since these initial groups no one has been certified without taking the exam. In this regard, I recall on several occasions when questions were raised whether the ABHP might grant certification to an incoming HPS president—who, at the time, was not certified. The answer then and now is "No"!

How many members were on the first Board and who were they?

Moeller: The first members of the ABHP were appointed in late 1959. They were five in number—John Healy, William A. McAdams, Elda E. Anderson, Lauriston S. Taylor, and John W. Laughlin. The first chair of

the Board, William McAdams, was appointed in 1960. Lauriston Taylor was appointed as vice chair.

Did you later serve on the ABHP?

Moeller: Yes, I was appointed to the ABHP in 1966 and served through 1970.

When did the Panel of Examiners come into existence?

Moeller: The first Panel was organized in 1960. The members were Frederick P. Cowan, Robert O. Gorson, Lawrence H. Lanzl, Lester S. Skaggs, William T. Ham, James M. Smith, Jr., John F. Sommers, W.E. Nolan, W.L. Reinig, and Roger Wallace. Frederick Cowan was appointed the first chairman. I served on the Panel from 1962 through 1965 and chaired it during my last year.

When did the ABHP (and Panel of Examiners) administer its first examination?

Moeller: The first one was given on 28 June 1960, during the fifth annual meeting of the HPS in Boston, Massachusetts. Fifteen candidates took this exam of whom 13 (86.7%) passed. This was a written examination that included five sections which covered radiation protection fundamentals and were designed to test professional judgment and maturity and the competence of the candidates on subjects relating to practical health physics.

The second was given simultaneously in Atlanta, Chicago, and Berkeley on 10 December 1960. I was one of the candidates in this group. Even to this day, I remember every detail. The questions were essay in nature and, during the four hours I was in the room, I wrote 57 pages! Sixteen (69.6%) were certified.

The third exam was administered during the annual HPS meeting held in Las Vegas in 1961. Twelve (66.6%) were certified.

Does this continue to be the approach today?

Moeller: No, several changes were later made. In 1965 the exam was separated into a Part I and a Part II. While Part II continues to be a written examination designed to test professional judgment and maturity and the competence of candidates on subjects relating to practical health physics, in 1968 Part I was converted into multiple-choice questions. This was accomplished through guidance provided by the Professional Examination Service, American Public Health Association. Financial support for this effort was provided by the Bureau of Radiological Health, US Department of Health, Education, and Welfare (HEW)—now the Department of Health and Human Services (HHS).

Simultaneously, a program was established to permit younger health physicists to take Part I. The requirements were that they fulfill the academic requirements for people seeking regular certification and that they have at least two years of professional experience. This had a twofold purpose: (1) to provide recent graduates the opportunity to demonstrate their competence in the fundamentals of health physics and (2) to encourage younger health physicists to begin to qualify for certification. Candidates successfully completing Part I were then required to take only Part II when they subsequently become qualified and apply for regular certification. This program proved to be very successful.

Who prepared the exams?

Moeller: The questions for Part II were, in general, developed by the Panel of Examiners. At the same time, however, the Panel recognized that, because the questions for Part I were multiple-choice in nature, special knowledge and expertise were required if the final products were to be deemed acceptable. As a result, the Board applied to the Bureau of Radiological Health, HEW for funds to enlist professional assistance in developing a "bank" of multiple-choice questions for use in Part I. With continuing updates this "bank" has served as a source of questions ever since.

What are some of your most vivid memories of your service on the Panel of Examiners?

Moeller: The one that stands out was that making decisions on those who "passed" and those who "failed" was not that easy! I say this because there was always a middle group for whom it was difficult to make a decision. To resolve the matter, we decided to administer an oral exam to each of the candidates in the middle group. In fact, about 30% of the candidates during those years were subjected to this process. For them, it was undoubtedly "torture" of the worst kind! Nonetheless, for the Panel it proved to be a very effective approach. In fact, in many cases it required only a few minutes to ascertain whether a candidate knew the subject or was simply quoting something he/she had read. Later, the practice of administering oral exams was discontinued.

Were there other similarly "vivid" observations?

Moeller: Yes, what stands out the most was the revelations provided by analyses we conducted during 1970 of the records of the 461

candidates who had taken the certification exam from 1960 through 1969. This work was funded by the previously cited Bureau of Radiological Health and the US Nuclear Regulatory Commission. Additional support was provided by Harvard University where I was serving as a faculty member at that time.

What was the purpose of the analyses?

Moeller: Our primary objective was to summarize statistically the training and experience of the candidates and to relate those factors, where possible, to their performance on the written exam. Because about one-third of the candidates at that time had received graduate training through the Health Physics Fellowship program of the US Atomic Energy Commission (AEC), we wanted, in particular, to compare the performance of these candidates to that of the group as a whole.

What did you find out?

Moeller: One was that candidates who had participated in the AEC Fellowship program did well. Another was that the success rate varied significantly depending on the specialty area of the candidate's undergraduate degree. For example, the percentage of the successful candidates ranged from almost 37% for those with a degree in physics/math, 21% for those in chemistry, and 18% for those in engineering to 10% for those in biology. Overall, about two-thirds of the candidates were certified, ranging from 21% for those without a college degree to 80% for those with a doctorate. For those readers interested in more details, a summary of the analyses was published in *Health Physics*, Vol. 20, page 505 (May 1971).

Were there any other interesting observations?

Moeller: Yes, there were several. One was that, as many disappointed candidates during that time period will attest, the success rate declined from about 75% in 1960 to about 48% in 1969! At the same time, the average grade of the candidates in 1969 was actually slightly higher than it was in 1960! Another was that the data permitted assigning success rates to the graduates of the radiation protection programs at individual US universities. To avoid embarrassing anyone, we did not divulge the results of this portion of the analyses!

Looking back, do you have any disappointments relative to the ABHP?

Moeller: None, whatsoever. I do, however, regret the current lack of financial support for graduate programs in radiation protection and safety. For those of us who were in college during the days when the AEC, and later the HEW, provided strong financial support for such programs, with hundreds of accompanying fellowships, the situation today, and the opportunities that young people have for graduate education in this field, are dismal, to say the least. In fact, the overwhelming majority of the health physicists of my age obtained their education through availing themselves of one or more of the federal government programs.

Do you believe that the ABHP has achieved its objectives?

Moeller: By all means—Yes! Many state governments now require that the directors of their radiation protection programs be certified. Many companies, such as Dade Moeller & Associates, proudly share with one and all the large numbers of certified health physicists on their staffs. Extending the recognition farther, both the National Council on Radiation Protection and Measurements and the American National Standards Institute define "qualified experts" as "for example, persons certified by the American Board of Radiology or the American Board of Health Physics." More recently—2001—the ABHP program was accredited by the Council of Engineering and Scientific Specialty Boards. These attainments of recognition, coupled with a vigorous and active American Academy of Health Physics, are all marks of accomplishment. Beyond any doubt, the ABHP is alive and well!

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*The ABHP initiated the McAdams award in 1989 in honor of William McAdams, its first chairman. The award honors a health physicist who has made a significant contribution towards increasing the professionalism of health physics and the certification process.

For more information on the beginnings of the ABHP:

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ABHP – Key Dates in Early History

Dade W. Moeller

1956 – The Health Physics Society (HPS) Board of Directors established a committee to study the need for certification of health physicists and to develop plans for a certification program if this appeared to be desirable.

1956-1958 – This was a period of intensive study by the committee. This led to the submission of a recommendation to the HPS Board of Directors that the HPS Directors establish an American Board of Health Physics (ABHP).

8 November 1958 – In response to the committee recommendation, the HPS Board of Directors established a temporary ABHP. The five members were C. Maurice Patterson, Elda E. Anderson, William A. McAdams, Lauriston S. Taylor, and John W. Laughlin.

June 1959 – The proposed certification program was discussed at an open session during the fourth HPS annual meeting in Gatlinburg, Tennessee. There was general support for the plan.

29 October 1959 – The HPS Board of Directors formally established the ABHP by approving an amendment to the HPS bylaws.

October-December 1959 – Eligibility requirements for certification were established by the ABHP.

December 1959 – The HPS Board of Directors named William A. McAdams temporary chairman of the ABHP. Members of the HPS were informed of these actions and provided instructions on how to apply for certification.

January-March 1960 – The ABHP established a Panel of Examiners.

11 March 1960 – The first meeting of the newly established ABHP was held in New York City.

28 June 1960 – Administration of the first examination to 15 candidates in Boston, Massachusetts, was held during the fifth annual meeting of the HPS; 13 (86.7%) were certified.

30 June 1960 – The second meeting of the ABHP was held in Boston, Massachusetts, during the fifth HPS annual meeting.

1 December 1960 – The ABHP was granted a charter by the state of New York—the first such charter ever granted by the New York Department of State to a private group to license and/or certify professional people. Provision was made for organizations other than the HPS to be represented on the Board.

10 December 1960 – Administration of second examination to a total of 23 candidates was held in Atlanta, Georgia; Chicago, Illinois; and Berkeley, California; 16 (69.6%) were certified.

16 December 1960 – The third meeting of the ABHP was held in New York City.

1 January 1961 – An offer of certification, without examination, was made to a group of 100 “obviously well qualified” individuals; of this group, around 80 accepted the invitation.

June 1961 – Administration of third examination to 18 candidates was held during the sixth annual HPS meeting in Las Vegas, Nevada; 12 (66.6%) were certified.

Spring 1961 – Steps were taken to provide copies of a compilation of questions from the three initial examinations to prospective examinees.

12 July 1961 – The ABHP formerly adopted a set of bylaws.

1962 – A more formal *Examination Preparation Guide* was issued. To assist candidates, the questions in these guides, which are updated periodically and continue to be available, are grouped into categories based on the subjects covered by the examinations.

June 1964 – The experience requirement for certification was set at six years, with the added stipulation that applicants must be at least 28 years of age.

1968 – Part I of the examination was converted from essay to multiple-choice questions. A program was established to permit younger health physicists to take Part I of the examination.

Atomic Energy Act Amended to Include Discrete Sources of NARM: President George W. Bush Signs the Energy Policy Act of 2005

J. Scott Kirk, CHP, Chair, Health Physics Society's Legislation & Regulation Committee
*Jared Thompson, Chair, Organization of Agreement States**

On 8 August 2005, President George W. Bush signed the Energy Policy Act of 2005 ("Energy Act") into law. This far-reaching legislation included provisions to enhance the security of nuclear facilities and amends the Atomic Energy Act of 1954 (AEA) to bring under unified federal control certain discrete sources of naturally occurring or accelerator-produced radioactive materials (NARM).


J. Scott Kirk

International Atomic Energy Agency's Code of Conduct

In the aftermath of the terrorist attacks in the United States on 11 September 2001, the international community has risen to the task of promoting uniform policies for securing certain radioactive materials. Since President Bush agreed to commitments made at the Eight-Industrial Countries (G-8) Summit in Evian, France, the United States has become the first of 74 member states to enact legislation and promulgate standards to better secure radioactive sources that could be used for malevolent purposes and implement the International Atomic Energy Agency Code of Conduct on the Safety and Security of Radioactive Sources ("Code of Conduct").

While the Code of Conduct lists certain sources of NARM, until Congress enacted the Energy Act, the Nuclear Regulatory Commission (NRC) had lacked the authority under the AEA to implement any of the commitments made at the G-8 summit for these types of radioactive materials.

Joint HPS/OAS Position Statement

The Health Physics Society (HPS) and the Organization of Agreement States (OAS) jointly signed a position statement titled "Congressional Action Is Needed to Ensure Uniform Safety and Security Regulations for Certain Radioactive Materials." More importantly, we also drafted legislation to amend the AEA to reclassify discrete sources of NARM. These paths were taken to both ensure public health and safety and to protect our national security interests by placing such sources under federal controls administered by the NRC.

On 14 January 2005, the joint position statement and draft legislation were forwarded to select members of Congress and various governmental regulatory agencies. Over the course of the past six months, the HPS has met with congressional staff from Senators Hillary Rodham Clinton, Pete Domenici, and James Inhofe's office and Congressman Edward Markey's office to further discuss our positions. We are pleased to report that many of our recommendations have been adopted in the Energy Act.

Our Rationale

From the beginning, the working group started with a common understanding that uniform radiation safety standards for sources of NARM were needed to protect public health and our national security. Furthermore, we envisioned our mission as one that

* The Organization of Agreement States is a nonprofit society of staff members from those states that have established programs under Section 274 of the AEA to assume a portion of NRC's regulatory authority.

would fill a long-standing hole in the AEA.

As a starting point, we reviewed legislation (Senate bills S.1043 and S.2763) that was introduced in the 108th Congress by Senators Inhofe and Clinton, respectively, to reclassify discrete sources of NARM under the AEA. During our review it became readily apparent that this legislation lacked waste disposal provisions and, therefore, might have unintended adverse consequences with respect to the Low-Level Waste Policy Act Amendments of 1980 (LLWPAA). As such, we sought a fresh new look at the manner in which low-level radioactive waste (LLW) is managed in the United States. To support our mission, we obtained expert legal advice from the Washington, DC, law firm of Thompson and Simmons, PLLC.

In drafting our legislation, we aimed to empower the federal government with the necessary authority to carry out its responsibility of protecting public health and national security. Therefore, we strongly believed that a "discrete" source of NARM should be defined during a rulemaking process, but not in legislation. We believed it wiser for Congress to enable NRC to define this important term during rulemaking that would require stakeholder input. The alternative would have required such a definition be cited in legislation that would literally require an act of Congress to change in the event the mark was missed.

We recognized early on that the states have a long history of regulating NARM and as early as 1976 have sought amending the AEA requiring NRC to assume control over sources of NARM. As such, the OAS brought forth considerable expertise in the manner in which NARM has been regulated in the United States for the past several decades. We also strongly supported a provision to allow for an orderly transition of authority, such that states could continue to regulate these sources without disruption until such time as the NRC promulgated appropriate regulations.

We supported the NRC's approach to avoid considering discrete sources of NARM as LLW under the LLWPAA for the purposes of providing cost-effective and accessible waste disposal options for these types of radioactive materials. The OAS agreed that disposal of naturally occurring radioactive material (NORM) should also encompass use and long-term management of uranium mill tailings sites commensurate with the Conference of Radiation Control Program Directors, Part N, Suggested State Regulations. Since this approach supported moving towards managing radioactive wastes based on the potential risk it posed to public health and was consistent with the HPS' public witness testimony to the United States Senate (Health Physics Society 2004), we drafted legislative language that would accomplish this objective.

Implementation of Rulemaking

Since this effort was initially reported (Dinger 2005) to the HPS' constituency, we have made tremendous progress in shaping legislation that has been enacted by Congress to reclassify discrete sources of NARM under the AEA. In the very near future, the NRC will begin rulemaking and solicit views from various stakeholders needed to implement these provisions of the Energy Act. Within 18 months, the NRC is required, after consultation with the states and other stakeholders, to issue final regulations including a definition of a "discrete" source of ^{226}Ra. While this legislation applies to all accelerator-produced by-product materials generated for commercial, medical, and research activities, its scope is statutorily limited to include only such sources of NORM that poses a threat similar to that posed by a discrete source of ^{226}Ra. Under these statutory provisions, NRC is required to issue regulations conforming to the import/export and source tracking provisions of the Code of Conduct.

For implementation of these regulations, the NRC is required to cooperate with the states and use model State Standards in existence to the maximum extent practicable. To facilitate an orderly transfer of regulatory authority, the NRC is also required to issue a transition plan for Agreement and Non-Agreement States.

Congress also mandated a significant change to the LLWPAA that allows for unimpeded access to disposal sites that are regulated by both NRC and the Environmental Protection Agency. While the legislation allows use of uranium mill tailing impoundments, it does not address title transfer to the Department of Energy into perpetuity as mandated under the Uranium Mill Tailings Radiation Control Act. However, during the rulemaking process, perhaps we can again share our expertise in addressing waste disposal alternatives and other important aspects of the legislation.

References

Dinger K (HPS Congressional and Federal Agency Liaison). HPS, CRCPD, and OAS join forces to pack their bags and sit together on the next train, first joint position statement developed. Health Phys News 1:1-5; 2005.

Health Physics Society. See Public Witness Testimony for the Record by the Health Physics Society to the United States Senate Committee on Energy and Natural Resources on Low Level Radioactive Waste Oversight September 30, 2004. Available at: http://hps.org/documents/HPSLLW Testimony.040930.pdf. Accessed 23 August 2005.

Veterans' Advisory Board on Dose Reconstruction

The Veterans' Advisory Board on Dose Reconstruction (VBDR) has been formed in response to a congressional mandate to provide guidance and independent oversight of the dose reconstruction and claims compensation programs for veterans of atmospheric nuclear weapons tests conducted by the United States from 1945-1962; veterans of the 1945 to 1946 occupation of Hiroshima and Nagasaki, Japan; and veterans who were prisoners of war (POWs) in those regions when the atomic bombs were detonated. Established by the Secretary of Defense and the Secretary of Veterans Affairs, the VBDR will provide review and independent oversight of the dose reconstruction and claims compensation programs for veterans who have contracted cancer and other illnesses that may be related to their exposure to radiation or fallout resulting from detonation of nuclear weapons.

The history of involvement of government agencies in reviewing and compensating radiogenic diseases experienced by veterans dates back to 1978. After investigation of a claim of radiation-induced disability filed in March 1977 by Army Sergeant Paul R. Cooper, who was a participant in Shot SMOKY of Operation PLUMBBOB, Congress directed the Defense Nuclear Agency (the predecessor of the Defense Threat Reduction Agency [DTRA], an agency within the Department of Defense [DoD]) to form the Nuclear Test Personnel Review (NTPR) program. NTPR was required to obtain information on the exposure of veterans from radiation or fallout in Japan or in US nuclear weapons tests. This information was then to be communicated to the Department of Veterans Affairs (VA) as a basis for conducting physical examinations and considering health care benefits for exposed veterans.

In 1981 Congress passed Public Law 97-72, which provided health care to atmospheric nuclear test participants and occupation forces and POWs in Hiroshima and Nagasaki. This Act was followed in 1984 by passage of Public Law 98-542, which directed VA to establish compensation standards for veterans who contracted illnesses and had documented exposure to radiation. Congress has subsequently passed more than one dozen public laws that have defined the current requirements for dose reconstruction by DTRA and compensation of veterans with radiogenic diseases by the VA and Department of Justice.

Those laws have been implemented in Title 38, Code of Federal Regulations, Part 3. The regulations require the VA to provide medical care and compensation to confirmed test participants, as well as indemnity compensation to survivors. To resolve claims, the VA uses one of two procedures depending upon the specific type of disease being claimed by a veteran. Under 38 CFR 3.309, if a veteran was a confirmed participant and has one of 21 types of cancer presumed to be radiogenic, the veteran is eligible to receive compensation regardless of the radiation dose received. A second procedure is specified in 38 CFR 3.311. That regulation defines procedures to be used to resolve claims for cancer and other illnesses that are not presumed to be radiogenic unless the veteran's radiation dose is determined to be high enough. The claims decision is based on a dose reconstruction by DTRA and an evaluation by the VA of the probability that the veteran's disease could have been caused by his/her radiation exposure.

In 2003 the National Academy of Sciences (NAS) published a report, "A Review of the Dose Reconstruction Program of the Defense Threat Reduction Agency." The report discussed a number of deficiencies in the procedures and quality of both DTRA's dose reconstruction program and the VA's claims adjudication process. Poor communication between the agencies and veterans was also cited as a weakness in the overall program. In response to the NAS report, Congress included special provisions in Section 601 of Public Law 108-183 (Veterans' Benefits Act of 2003, enacted on 16 December 2003) that required actions be taken to improve the claims compensation program for veterans with radiogenic diseases. The first requirement was preparation by DoD and the VA of a summary for Congress of the current status of the dose reconstruction and claims adjudication programs, and a plan of action to correct deficiencies in these programs. That report was prepared by DTRA and the VA with assistance from the National Council on Radiation Protection and Measurements (NCRP) and submitted to Congress on 3 June 2004. The report can be accessed at http://vbdr.org.

The second requirement of Public Law 108-183 was the establishment of an independent advisory board to provide oversight of the improvement and quality management of procedures used in the veterans' radiation claims program. It was also specified that the board membership should include experts in historical dose reconstruction, radiation health matters, risk communication, representatives of DTRA and the VA, and at least three veterans, one of whom must represent a veterans' organization. The agencies named this board the VBDR, and it was formally chartered on 24 November 2004 under the provisions of the Federal Advisory Committee Act (Public Law 52-463). This Act requires that the Board's meetings be held in public venues and that all documents prepared by VBDR be available to the public.

With advice and assistance from NCRP, DTRA and the

VA nominated 16 candidates for membership on VBDR, all of whom were approved by the DoD White House Liaison Office by 18 May 2005. Retired Navy Vice Admiral James A. Zimble, MD, a former Surgeon General of the US Navy, was selected as the VBDR Chairman. The other VBDR members, their affiliations, and areas of expertise follow:

James A. Zimble

Dose Reconstruction:
Harold L. Beck (Environmental Measurements Laboratory, New York [retired])
Paul G. Voilleque, MS, CHP (MJP Risk Assessment, Inc., Denver, Colorado)
Radiation Health Effects:
Kenneth L. Groves, MS (Sevorg Services, Rutheron, New Mexico)
Kristin Swenson, PhD (RadAmerica, Inc., Clinton, Maryland)
Gary H. Zeman, ScD, CHP (Lawrence Berkeley National Laboratory, Berkeley, California)
Radiation Epidemiology:
John D. Boice, Jr., ScD (International Epidemiology Institute, Rockville, Maryland)
Medicine:
Ronald R. Blanck, DO (University of North Texas Health Science Center, Fort Worth, Texas)
Quality Management:
David E. McCurdy, PhD (consultant in nuclear engineering and services, Northboro, Massachusetts)
Curt W. Reimann, PhD (National Institute of Standards and Technology, Malcolm Baldrige National Quality Program, Gaithersburg, Maryland)
Decision Analysis:
John Lathrop, PhD (Lawrence Livermore National Laboratory, Livermore, California)
Ethics: Appointment pending
Atomic Veteran Representative:
Edwin Taylor (Colonel [Ret.], US Army and representative of veterans' organization [NAAV, the National Association of Atomic Veterans])
DTRA Representative:
Paul K. Blake, PhD, CHP (Program Manager, NTPR)
VA Representative:
Thomas J. Pamperin, MBA (Assistant Director for Policy, Compensation and Pension Service, VA).

The members of VBDR represent a range of expertise that fully meets the requirements of Public Law 108-183; there are eight military service veterans on the Board; and the members of the Board have academic, government, military, and private sector backgrounds. Technical and administrative support to VBDR is provided by NCRP, with key staff members being Isaf Al-Nabulsi, PhD, the Program Administrator, and Melanie Heister, the Senior Administrative Assistant.

VBDR held its first public meeting in Tampa, Florida, on 17-18 August 2005. To encourage and facilitate attendance by veterans, the dates of the VBDR meeting were chosen to immediately follow the annual conference of NAAV, which was held in Tampa on 14-16 August. At the Tampa meeting VBDR formally approved the membership and scope of work of four subcommittees that will carry out the primary activities required under Public Law 108-183. Reports prepared by the subcommittees will be discussed at VBDR open public meetings prior to final approval of findings and recommendations by the entire Board.

The membership of the four subcommittees follows:
SC 1: DTRA Dose Reconstruction Procedures (Chairman Harold Beck, Paul Blake [DTRA liaison], Paul Voilleque, and Gary Zeman)
SC 2: VA Claims Adjudication Procedures (Chairman Ronald Blanck, Thomas Pamperin [VA liaison], James Zimble, and ethicist TBA)
SC 3: Quality Management and VA Process Integration with DTRA Nuclear Test Personnel Review Program (Chairman Curt Reimann, John Lathrop, David McCurdy, and Kristin Swenson)
SC 4: Communication and Outreach (Chairman Kenneth Groves, John Boice, John Lathrop, Edwin Taylor, and Elaine Vaughan).

At the Tampa VBDR meeting, five hours were included on the agenda for veterans to make public comments on their diseases they believe are related to exposure to radiation or fallout from nuclear weapons. The veterans who gave public statements also discussed their concerns about problems in DTRA's dose reconstruction procedures and the claims decisions made by VA. Public sessions of similar length will be included in the agendas of future VBDR meetings.

The next VBDR meetings will be in Southern California on 12-13 January 2006 and in Texas on 8-9 June 2006. The cities in which the meetings will be held will be announced soon on the VBDR Web site (http://vbdr.org). This Web site also contains biographical information on VBDR members and answers to frequently asked questions on the veterans' dose reconstruction and claims compensation programs. Minutes of meetings, press releases, and other information related to the overall mission and activities of VBDR will be posted on the VBDR Web site on a regular basis.

Note: *Health Physics News* summarized other radiation compensation programs in the November 2002 and January 2003 issues.

Laser Strikes on Aircraft: Crisis or Nonissue?

Ben Edwards, MS, CLSO

We often encounter issues that present confusing or contradictory messages, both to the general public and to the presumably more knowledgeable "experts" whose training and experience should allow a more discerning opinion. Late last year and early this year, the noise and commotion over laser beams striking aircraft provided just such a conundrum. Consider the following headlines and brief synopses:

- *"US warns of terrorist lasers"* [*CNN*, 9-Dec-04]; FBI and Homeland Security memo indicates evidence that terrorists have explored using lasers to shoot down planes . . .
- *"Official: No Laser, terrorism link"* [*USA Today*, 2-Jan-05; *CNN*, 3-Jan-05]; DOT says FBI investigation into recent series of incidents concluded no terrorist link . . .
- *"NJ Man In Trouble Over Sky Lasers"* [*CBS News*, 4-Jan-05]; David Banach of Parsippany, New Jersey, admitted pointing green laser at several aircraft; a chartered jet was flying at 3,000 feet when green laser hit windshield, temporarily blinding pilot and copilot . . .

Confronted with this information, the diligent and civic-minded reader might conclude that unregulated lasers pose a national security threat, except that they don't yet, but that some people with lasers are causing trouble all the same. What's really going on here?

The phenomenon of lasers disrupting pilots is not new. The FAA (Federal Aviation Administration) has been receiving reports about this sort of thing for decades, including over 150 reports of low-flying aircraft being illuminated by lasers—mostly laser pointers—between January 1996 and July 1999 in the Western-Pacific region alone (FAA 2001). However, the late 2004 incidents briefly created a media tempest, which quickly disappeared in the wake of subsequent attention-grabbing headlines. Now that the excitement has died down, let's review the facts to see if we can better ascertain the threat level and just maybe respond more coherently next time the issue arises.

A laser need not cause a pilot eye injury to disrupt the normal operation of an aircraft. The FAA identifies three categories of air crew visual impairment:

- Glare: dazzling sensation induced by relatively bright light, producing unpleasantness, discomfort, or interference with optimal vision; generally ceases once stimulus is removed, but residual effects (spatial disorientation, loss of situational awareness) can persist;
- Flash blindness: visual loss during and following exposure to high-intensity light flash; may last a few seconds to several minutes; and
- Afterimage: persisting sensation or image after stimulus is removed.

An FAA study of flight crews in simulators exposed to various levels of laser radiation found that exposure to ≥ 0.5 $\mu W/cm^2$ causes visual impairment (FAA 2004). Landing approach is the most critical time and, in fact, distractions during this crucial period are limited by law (49 CFR 121.542, 125.311, and 135.100). To prevent distractions associated with pilot laser exposure, the FAA's Order 7400.2 (Part 6, Chapter 29, "Outdoor Laser Operations") long ago established maximum allowable irradiance levels (flight-safe exposure limits) in the area around airports, as follows:

- Laser-Free Zone—two nautical miles (3.7 km) from runway centerline in all directions, plus additional three nautical miles along flight path, to 2,000 ft; 50 nW/cm^2 (distraction)
- Critical Flight Zone—10 nautical miles (18.5 km) from airport center point; 5 $\mu W/cm^2$ (glare)
- Sensitive Flight Zone—(distance established on case-by-case basis) 100 $\mu W/cm^2$ (level for significant flash blindness and afterimage)
- Normal Flight Zone—2.5 mW/cm^2 (exposure <MPE)

The areas delineated by the flight-safe exposure limits for a typical two-runway airport are shown in Figures 1, 2, and 3.

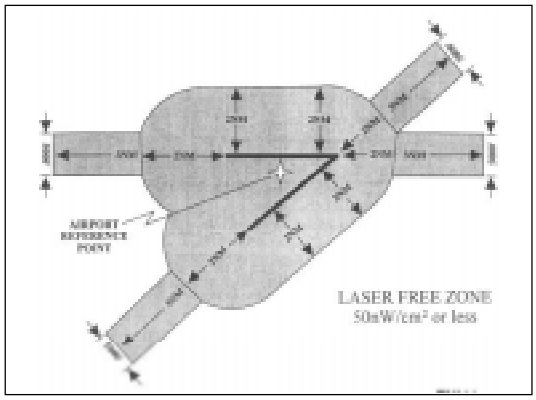

Figure 1. Laser-Free Zone for two-runway airport (reproduced from FAA Order 7400.2); one nautical mile (NM) = 1.852 km.

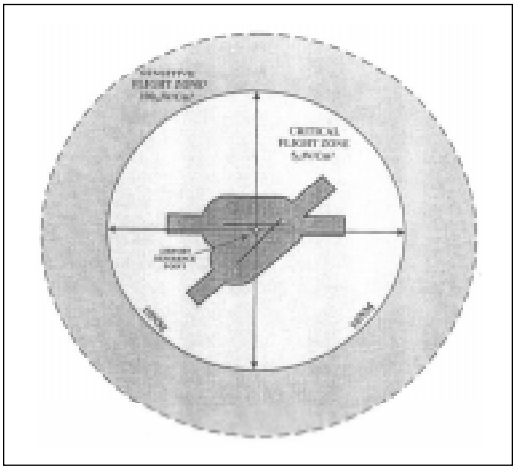

Figure 2. Sensitive Flight Zone (SFZ) and Critical Flight Zone (CFZ) for two-runway airport (reproduced from FAA Order 7400.2).

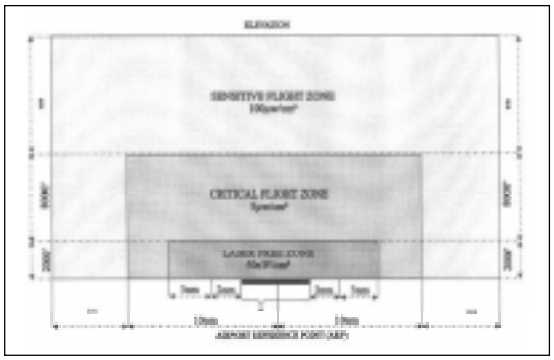

Figure 3. Airspace Flight Zones for two-runway airport (reproduced from FAA Order 7400.2).

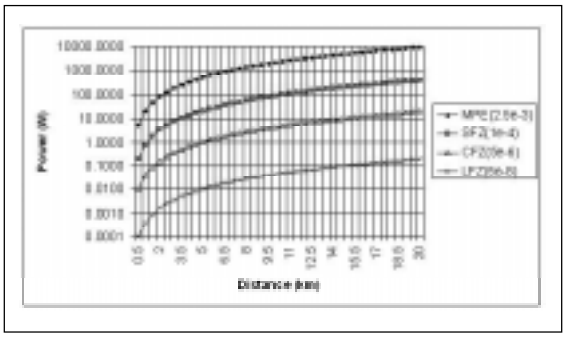

Figure 4. Power required for a typical (1 milliradian divergence, negligible beam diameter) visible laser to exceed the specified FAA irradiance limit at the distance given, assuming 10^{-7}/cm atmospheric attenuation.

What types of lasers pose the greatest hazard? Only visible (400 to ~770 nm) lasers can produce the FAA's low irradiance visual impairment effects (distraction, glare, flash blindness, and afterimage). Other wavelengths can of course cause serious eye injury, but require much higher irradiances to do so. Near infrared (~770 to 1,400 nm) could produce such an injury but would require a visible aiming beam or some other optical aid (for example, infrared viewer) to allow targeting of an aircraft cockpit. Similarly, far infrared (>1,400 nm) and ultraviolet (<400 nm) wavelengths would require some optical aiming aid, plus these wavelengths would probably be too attenuated by the atmosphere and aircraft windows to pose a serious threat. Recall from Sliney and Wolbarsht (1980, p. 495) that glass or plastic windows block wavelengths <200 nm or >5,000 nm (for example, ArF excimer or CO_2 lasers). The majority of reported incidents and the factors listed above indicate that visible wavelength lasers should be the focus of any effort to control this potential air safety hazard.

To get an idea of how much power from a visible cw laser it would take to exceed the FAA limits at various distances, I made some laser range equation calculations based on "worst case" assumptions, that is, divergence of 1 milliradian, beam diameter negligible compared to distances involved, atmospheric attenuation of 10^{-7} per cm as specified in Appendix B of ANSI Z136.1-2000 (p. 102). The results appear in Figure 4, illustrating the difficulty of exceeding the MPE at an aircraft from the ground (for example, would require ~1,000 W cw at 7 km). However, causing visual impairment is much easier, requiring only about 10 W cw to exceed the CFZ (glare) limit from 15 km away.

So what conclusions can be drawn from this admittedly cursory analysis? The FAA has identified helicopters as particularly susceptible to laser strikes because of their slow speed and comparatively low operating altitudes (FAA 2001). Also, a malevolent (or just irresponsible) person with a high-powered visible laser far from a runway or helipad could wreak havoc. High-powered lasers are plentiful and easily accessible. On the other hand, high-powered lasers have historically been large, expensive, and logistically demanding (in terms of power requirements, auxiliary cooling equipment, technical expertise, etc.), though newer semiconductor lasers are rapidly eliminating these barriers. Also, no aircraft crashes have been directly attributed to laser strikes.

What control measures, if any, are needed to protect against this hazard? While many states require the registration and control of high-powered lasers (Rockwell et al. 1999), most do not, and lasers remain easily accessible both new and on the low-cost surplus market. Even if all states adopted stricter controls, legislation requiring laser registration has not been shown to reduce laser-aircraft incidents. On an individual laser safety officer (LSO) level, I encourage all LSOs to prevent or detect unauthorized laser diversion by rigorously tracking the inventory of Class 3b and 4 lasers on their site and to account for any lasers indicated as missing by a physical inventory. LSOs should also alert each other of the transfer of class 3b or 4 lasers between institutions. Surplus lasers should be rendered inoperable prior to release to the general public. And of course, LSOs should ensure compliance with all appropriate measures to eliminate or restrict the propagation of laser beams outdoors. Finally, I invite *Health Physics News* readers to share their opinions on what control measures, if any, health physicists should take or advocate regarding this issue.

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Sliney D, Wolbarsht M. Safety with lasers and other optical sources. New York: Plenum Press; 1980.

Inside the Beltway

David Connolly
Washington Representative
Capitol Associates, Inc.

Since the name of this column is "Inside the Beltway" it is with great pleasure that I am reporting this month on my travels "outside the beltway." Another topic could also be, as will become popular very soon in schools throughout the country, "What I learned during my summer vacation." In particular, I would like to focus on my trip to the Society's annual meeting in Spokane, Washington.

By way of admission, I must first confess to you that I love to visit different parts of the country. In the field of federal government relations, I think it is essential to leave the nation's capital periodically to see what other citizens are doing with their lives. You must remember that when you live and work in the national capital region, there is more focus on national politics than in any other part of the country. Therefore, the opportunity to get away from here is welcoming. Once outside the capital region, one can better understand what the rest of the country is doing and what their federal legislative needs are.

Because there are no direct flights from Washington, DC, to Spokane, we (my wife was able to attend the meeting with me) had to change planes in Minneapolis/St. Paul, Minnesota. As we descended toward the airport, I was again reminded of how much land is devoted to agriculture in the east central part of the country. Upon entry in the terminal, I was surprised not only by the size and number of businesses in the airport, but the amount of people who were actually beyond the security points and in the act of catching a flight to somewhere else. Once again, it underscored the vital role travel and tourism plays in the US economy. There is no trickle-down effect in this airport; most of the workers' income is directly attributed to the airline tickets the travelers had purchased.

Upon arrival in Spokane, we were introduced to a region which has a different outlook on leisure time. When traveling around the capital area, one does occasionally see a camper or a weekend house trailer being pulled by a vehicle. In the Spokane/Idaho area, it seemed that every other vehicle on the road was some sort of RV! Now, having experienced for the first time the natural beauty of the mountains of Idaho, I understand the attraction, but my eastern eyes were still surprised by the number of people who use these vehicles.

So what did I learn from these observations? Once again, I learned how essential energy is to the US economy. From the use of petroleum products in agriculture, to jet fuel, to the cost of gasoline for RVs, so many Americans' everyday activities and livelihoods are directly connected to energy availability. As our plane touched down in Washington, DC, I knew that the debate on national energy policy was not concluded with the passage of the Energy Bill but really just beginning. Too many voters have too much connection to the affordability and availability of energy for Congress to sit idly by as oil prices continue to rise. Health physics will very much be a part of that debate.

The rest of Washington has been quiet due to the August recess, but this will soon change as Congress returns to full legislative agenda, which includes the John Roberts nomination and completing the remaining spending bills. We will keep you posted in the weeks to come.

Corrections to the 2005-2006 Committee Appointments Listed in the September 2005 *Health Physics News*:

Awards Committee: Add Ruth E. McBurney 2010

Rules Committee: Delete Lisa M. Bosworth 2007

Science Teachers Workshop Committee: Delete Lisa M. Bosworth 2006

Notes

Providence 2006—Something for Everyone

Tara Medich

The New England Chapter of the Health Physics Society (NECHPS) cordially invites you to attend the annual HPS meeting in Providence, Rhode Island, in June 2006. The Local Arrangements Committee is hard at work to make the 50th anniversary closeout celebration a memorable event.

If you've never been to New England before, summer is a fine time to explore the area in and around Providence. The organized social tours will offer the highlights of the region, but with a bit of additional planning, and maybe a few extra days built into your trip, you can create an itinerary to suit your tastes. Since we are such a compact geographical area, most areas are accessible by a short car ride or train.

Providence's history can be observed just by walking down its streets. Stroll down Benefit Street on its "Mile of History," or just wander around and enjoy the surprise around the next corner. Interested in a unique museum? There's a Russian sub docked in Narragansett Bay, not far from downtown. For a bit of wildlife, the Roger Williams Park Zoo is less than a mile from the Westin, the host hotel for the HPS meeting. Venturing a little farther from the city, Newport should be on your must-see list—the dazzling "summer cottages" of America's wealthiest families along with the laid-back seaside atmosphere is the perfect combination for a pleasant day.

Why not take advantage of summertime near the ocean? The Cape Cod season will have just started, and the beaches of Connecticut are lovely as well. Mystic (Connecticut) Seaport is a bustling resort town that revels in its seafaring heritage. Don't forget that the lobster is divine at that time of year.

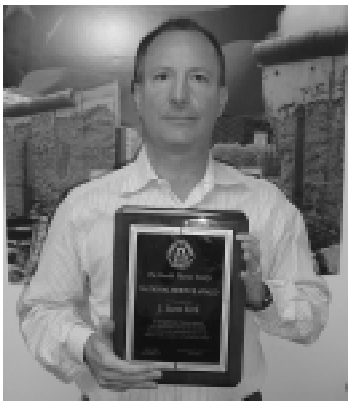
Whatever your fancy, the NECHPS is eager to welcome you to New England next summer!

HPS National Service Awardees

Health Physics Society (HPS) President Raymond A. Guilmette presented HPS National Service Awards in July 2005 to three Society members in recognition of "unique and significant service to the HPS and significant contributions to the science and practice of radiation safety."

Ralph Andersen: For his timely, informed representation of the HPS on committees and panels for the Departments of Homeland Security, State, and others, sometimes with very short notice. His participation in selected HPS activities in Washington has been a great help to the Governmental Relations program by providing participation and a presence at the table.

Charles Roessler: For his role in moving the HPS forward in the ABET (Accreditation Board for Engineering and Technology) process, including serving as the first HPS representative on the ABET Applied Science Accreditation Commission and serving as the team chair on accreditation visits.



Scott Kirk: As chair of the Legislation and Regulation Committee and as HPS representative to the OSHA Alliance. He provided timely, polished documents to the HPS president for HPS interactions with Congress and federal agencies.

HPS Members Receive NIH Grants to Improve Human Phantoms and Dosimetry

Several Health Physics Society (HPS) members have recently received major grants from the National Institutes of Health (NIH).

X. George Xu from Rensselaer Polytechnic Institute is the principal investigator (PI) of a newly awarded three-year R01 research grant by the National Cancer Institute to develop 3-D virtual patient models that will more accurately compute radiation doses for CT (computed tomography) imaging, nuclear medicine, and radiation treatment of cancer patients. Other HPS members participating in this project are Michael Stabin and Randy Brill from Vanderbilt University, Wesley Bolch from the University of Florida, and Keith Eckerman from Oak Ridge National Laboratory. The team includes additional researchers from Rensselaer, Massachusetts General Hospital, Los Alamos National Laboratory, and Johns Hopkins University who bring expertise in the diverse fields of computer science, CT imaging, nuclear medicine, and proton therapy to the multidisciplinary project.

Coinciding with this project, a Small Business Technology Transfer project by the National Cancer Institute is being led by Stabin to update the OLINDA/EXM software package with a realistic phantom set. This code is the successor to the MIRDOSE code and has been widely used in nuclear medicine.

Bolch was a PI on one previous R01 project from the National Institute for Biomedical Imaging and Bioengineering on pediatric tomographic phantom development and continues to coordinate a National Cancer Institute R01 project on image-based skeletal dosimetry for molecular radiotherapy.

Above, an adult male model developed at Rensselaer.

These recent projects from the NIH are aimed at bringing about a paradigm shift in the way the human body is modeled by using medical images and advanced Monte Carlo methods.

These projects will collectedly develop a library of computational human phantoms that represent virtual female and male patients of various ages and body sizes. The researchers also will develop advanced 4-D patient models that simulate organ deformation and motion. Operational health physics and clinical procedures will be studied to provide a variety of fundamental external/internal dosimetry data.

Summer School 2006

Margaret E. McCarthy, PhD
Administrative Dean

The topic of the 2006 Health Physics Society (HPS) summer school will be health physics aspects of medically applied radiation. The meeting will be held 18-23 June at the facilities at Brown University, Providence, Rhode Island.

For those of you who are now budgeting for travel expenses for the coming fiscal year and need more information on summer school costs, go to the HPS New England Chapter Web site at www.nechps.org. The specific URL for the summer school is http://nechps.org/SS06/ss06.html.

I will be updating the Web site as I receive confirmations from Brown University.

2006 Health Physics Society Student Travel/Worker Grants

The Health Physics Society (HPS) announces the availability of travel grants and travel/worker grants for health physics students planning to attend the next annual meeting of the HPS. To be eligible for this award a student must be a current member of the HPS (on record as having paid the 2006 dues), must be an undergraduate or graduate student in health physics or a closely related field with an area of concentration in health physics, and must have a strong health physics career interest. The award would consist of free meeting registration, free hotel room (based on shared accommodations), and funds to assist in travel to the annual meeting. Working at the meeting would involve five half-day sessions during which the student would assist in running projectors, setup, etc. Students who receive travel grants must attend the awards ceremony during the annual meeting. The granting of an award and the actual amount of travel funds will depend on the number of applicants and will be consistent with the following priority schedule:

1. Students presenting a paper and willing to work	**1st Priority**
2. Students presenting a paper and not working	**2nd Priority**
3. Students willing to work (no paper presentation)	**3rd Priority**
4. Students neither working nor presenting	**4th Priority**

The travel grant application and all supporting material must be postmarked no later than 1 March 2006. Award winners will be notified by 15 April 2006. Students who are given this award play a vital role in the overall management of the annual meeting. Consequently, students who for any reason cannot attend the annual meeting must notify Mike Johnson at the HPS Secretariat **as soon as possible** either before or after an award notice is received. Interested students should fill in the form below and send it to MIKE JOHNSON (mjohnson@burkinc.com), HEALTH PHYSICS SOCIETY, 1313 DOLLEY MADISON BLVD, SUITE 402, MCLEAN VA 22101; phone: 703-790-1745; fax: 703-790-2672. (Please submit forms electronically if possible.)

1. Name: _____

   University/College: _____

2. Address: _____

   _____

   Phone: _____ Fax: _____ Email: _____

3. Distance to Providence, Rhode Island, from your institution: _____ miles

4. Are you an Associate's Degree, BS, MS, or PhD candidate? _____ Expected graduation date: _____

5. Semesters of study completed by February 2006: _____

6. If you are on the executive council of a Student Health Physics Branch, please indicate the office you hold:
   _____

7. Are you presenting a paper at the meeting? Yes _____ No_____
   If presenting a paper, give the title and attach a final or preliminary abstract.

   Paper title: _____
   _____

8. Are you willing to work roughly five half-day sessions at the meeting? Yes_____ No_____

9. Date of membership (or application for membership) in HPS: _____

10. I certify that the above student is presently enrolled in our health physics program, plans to attend the annual meeting, and intends to present any papers listed.

_____ _____

Academic Program Director—Name typed or printed Academic Program Director—Signature

2006-2007 Health Physics Society Fellowships

The Health Physics Society (HPS) announces the availability of the following fellowships to support full-time entering or continuing students enrolled in bona fide US graduate programs in health physics or a closely related field. Seven fellowships are available for the academic year 2006-2007. The prestigious Burton J. Moyer Memorial Fellowship was established by the Northern California Chapter of the HPS to memorialize the late Burton J. Moyer and to encourage his ideals in the study of the safe use of radiation for the benefit of all people. The award consists of a stipend of $7,500. The Robert S. Landauer, Sr., Memorial Fellowship consists of a stipend of $6,000. The Robert Gardner Memorial, Richard J. Burk, Jr., and J. Newell Stannard Fellowships each consist of a $5,000 stipend. Two additional HPS Fellowships are also presented each year, consisting of a stipend of $5,000 each. All HPS and named fellowships are accompanied by a travel grant to be used in attending the HPS annual meeting in the year 2006. All fellowship recipients are required to attend the awards luncheon during the annual meeting. Foreign nationals may apply. Previous HPS Fellowship holders are ineligible. The fellowship applications and all supporting materials, such as letters of reference, must be postmarked no later than 1 March 2006. Applications which are not 100% complete will not be considered. Award winners will be notified on or about 15 April 2006. A student who, in addition to the HPS Fellowship, is awarded a DOE, NRC, or other fellowship which is fully funded (stipend, books, tuition, etc.) is strongly encouraged to decline the HPS Fellowship at the earliest possible date so that these funds may be given to another deserving student. The decision to decline or accept the HPS Fellowship should be made in consultation with the Faculty Advisor. Mail the application form below and all supporting material to STEPHANIE CROSS (scross@burkinc.com), HEALTH PHYSICS SOCIETY, 1313 DOLLEY MADISON BLVD, SUITE 402, MCLEAN VA 22101; phone: 703-790-1745; fax: 703-790-2672. (Please submit forms electronically if possible.)

1. Name: _____

2. Address: _____
_____

3. Phone: _____ Fax: _____ Email: _____

4. Undergraduate and Previous Graduate Work:

	Institution	Dates	Major	Credits	GPA*	Degree
a.						
b.						
c.						
d.						

*Express GPA on a scale of A=4.00; if other, please specify scale. Submit copies of all undergraduate and graduate transcripts.

5. GRE scores: Quant.:_____; Anal.:_____; Verbal:_____

GRE scores are required to be considered for these fellowships. Enclose a copy of your GRE score report. If you cannot take the GRE in time for the scores to reach the Executive Secretary by 19 February 2006 you may submit a copy of earlier SAT scores.

6. Name of academic program advisor, telephone number, and institution for the health physics graduate program for fellowship study:

_____

It is the applicant's responsibility to request that the academic advisor write a letter outlining the proposed course of study, a description of the courses to be taken, and the proposed starting date for graduate study. Applicants for the HPS Fellowships for Entering Graduate Students need not have been formally accepted by the program at the time this letter is written.

7. Statement of personal goals: Provide a one-page statement about your personal career goals, including a statement about your intent to enter the field of health physics.

8. Letters of recommendation: Names of two people whom you will ask to write letters attesting to your potential for graduate study in health physics. These letters must be received by 19 February 2006 for the application to be considered complete.
1._____ 2._____

9. Statement of financial support: Applicants for HPS Fellowships for Entering Graduate Students must, on a separate sheet, list all other financial support that they will have to fund a graduate program. Applicants should also indicate any pending or planned fellowship or assistantship applications.

10. Do you wish to be considered based upon unusual conditions of financial need?
Yes__ No__ Please include a one-page letter outlining, in detail, your financial situation and need.

President Ruth E. McBurney

Mary Walchuk

The 50th year of the Health Physics Society (HPS) brings with it the 50th president of the Society, Ruth E. McBurney. McBurney took office at the 2005 Annual Meeting in Spokane, Washington, and is eager to share her energy and ideas with the HPS membership.

What was your first job in health physics and what is your job now?

McBurney: Right after I finished the course work and research project for my master's degree, I got married and moved to Columbia, Missouri. I was beginning to think that I had entered the wrong field, since the response I got from two of the positions I applied for in operational health physics was "We don't hire women." Of course, there are laws against that now. So my first job out of graduate school was not actually in health physics, but I got the job because of a background in radiation and radioisotope techniques. The position was senior research technologist in the large-animal reproduction lab (yes, cows, horses, and pigs) at the University of Missouri School of Veterinary Medicine. Primarily, I performed large-animal reproductive hormone studies using radioimmunoassay during the early years of its development and prior to prepackaged kits. It was a great learning experience for me in research techniques and radiochemistry, not to mention obtaining more information than I wanted to know about large-animal reproduction (such as listening to the training film on artificial insemination with background music of the Tijuana Brass's "The Lonely Bull"). By the time I left to go back to Arkansas two years later, the University Radiation Safety Office had discovered that I knew health physics in carrying out my laboratory duties, including contamination control, waste management, etc., and was ready to offer me a position.

I worked for several years in radioimmunoassay as new diagnostic tests were being introduced in the clinical and hospital setting (humans this time). My first position as a regulatory health physicist was with the Arkansas Department of Health, starting in 1977. I was the first female to work in the Arkansas program. Over the years, both in Arkansas and in Texas, I have been involved in inspection and licensing of facilities, emergency response, and standards development. Two of the great things about working in a state regulatory program are that you learn at least a little about a lot of radiation areas—radioactive material use, x rays, lasers, accelerators, and nuclear power—and you have the opportunity to coordinate with other people throughout the country who become great colleagues and resources.

Currently, I am the manager of the Radiation Safety Licensing Branch in the Texas Department of State Health Services. In that capacity, I oversee the licensing and technical assessments for approximately 1,600 radioactive material licenses in one of the larger Agreement State radiation control programs. Not only does Texas have a wide variety of uses of radioactive material—medical, source and device manufacturing, research, industrial radiography, oil and gas well logging, etc.—but it also has uranium mining and waste processing facilities, which present complex issues involving not only health physics, but also geology and engineering. The registration of x-ray machines and laser devices at approximately 16,000 facilities is under my direction. We also are one of three states that accredit mammography facilities and we also have a state certification program for mammography. The Operations Group in my branch maintains all our files and records and collects the fees that keep us going.

Which health physicists have you worked with who have been inspirational in your career?

McBurney: There have been quite a few people I have been privileged to work with over time who have encouraged and inspired me to reach farther. To name a few, Dave Snellings, my first supervisor in Arkansas, and Ed Bailey, Dave Lacker, and Richard Ratliff in Texas encouraged me to become certified by the American Board of Health Physics and to get involved on the national level, both in establishment of model state regulations and in American Board of Health Physics and Health Physics Society activities. In the Texas program, I was able to work on some innovative regulatory issues for which we were the "first," even before some of the standards had been established at the national level—well logging, industrial radiographer training and certification, NORM, and low-activity waste disposal. Although I didn't have John Poston for a college professor, I was privileged to have studied internal dosimetry and external dosimetry at short courses under his lectureship. I

admired the way he could teach health physics concepts in an understandable and usable manner and his willingness to give of his time and expertise in the training of others. While in Arkansas, I also worked with Greta Dicus, first as her supervisor, then as her colleague after I moved to Texas. It has been gratifying to me to see her successes in moving up to Commissioner at the Nuclear Regulatory Commission and being appointed to the International Commission on Radiological Protection.

I have also worked with a lot of great and inspiring folks through the Society—some of the recent officers and our congressional and agency liaison, Keith Dinger, as well as health physicists I worked with in the development of standards for NORM. I am still learning from all of them, and they have been highly supportive of my efforts.

If you could talk to one of the famous health physicists of the past, who would it be, and why?

McBurney: I have heard so much about Elda Anderson and that she was not only the first female to hold the office of president of the HPS but was also involved in its formation. I think that she would be a fascinating person to talk with about how the profession has evolved over time and the changing attitudes about women in the field of health physics. Another reason is that education has been an important factor in my life, and her involvement in the training and education of health physicists was outstanding.

When and why did you join the HPS?

McBurney: I joined the Society in 1979, while working in the radiation control program in Arkansas. I first joined the Deep South Chapter in 1978, at a time when this chapter also included Arkansas. I was encouraged by several of my colleagues in the chapter to join the national Society in order to receive some of the benefits—the journal, newsletter, and information on happenings and developments in the field of health physics. These were useful tools in my work. I started attending national meetings in 1982, when the annual meeting was in Las Vegas, and met some of the wonderful people in this organization. It was not only a great educational and networking experience, but a fun one as well. Suzie Kent and I won a trophy at the Night Out at the rodeo!

What was your president-elect year like? Did you learn anything new about the Society? Do you have any advice for this year's president-elect, Brian Dodd?

McBurney: Although it involved a hectic schedule, the year was quite gratifying and exciting. The chapters were very gracious in meeting my schedule needs and their hospitality was wonderful. I was able to visit 35 chapters during the year. The chapters were really interested in having the president-elect as a guest speaker and visiting with chapter members. I learned a great deal about the diversity of issues that are important to the chapters and was able to go on some special technical tours of places where the members work. Many chapters are concerned about how to keep up interest in membership and in participating in chapter projects. As a part of my presentation, I asked how the national Society could better assist the chapters in remaining viable and in addressing the needs of health physicists in the ever-changing workplace, global, and regulatory environments. I came away with many excellent recommendations that I hope to incorporate into the activities of the Society this year.

My advice to Brian is to interact with the chapter members as much as possible during the visits and listen to the concerns of the membership about the profession and the Society. They have a lot of good ideas which, if incorporated into our strategies and activities, should improve our interface with the chapters and help the individual chapters to make improvements in providing Society benefits at the local level as well.

Why did you want to be president of the HPS?

McBurney: At the encouragement of several members of the Nominating Committee, primarily John Auxier and Gen Roessler, I considered even a nomination to the office a great honor. The opportunity was presented as a natural progression of service to the Society, after having served on three committees—Program, Legislation and Regulation, and Strategic Planning—and as a director on the Board and Society secretary. I really enjoy being involved in Society issues and following through on initiatives that have been started, especially in our coordination on congressional and regulatory issues and greater collaboration with other organizations. I see serving the Society as a way to "give back" and promote the health physics profession.

What are your plans and goals for this year as president?

McBurney: Although the work of the Society cannot be identified with a single president or Board and, in fact,

is a continuum over several years' time in order to effect improvements and new initiatives, there are several areas on which I plan to focus efforts this year:

- Addressing the needs of the chapters and membership by implementing some of the recommendations made at the chapter visits, including exploring ways to do more public outreach, stirring greater interest in membership in the Society, and creating alternative mechanisms for continuing education.
- Human capital issues—We need to continue to look ahead to making sure that future human resource needs in health physics are met over the next 15 years. Our efforts in the area of academic education funding are one piece of this, but there are other strategies that we can pursue as well, including outreach in the public schools and colleges for awareness of health physics as a profession and improved communication of information on fellowships and scholarships.
- Establishment of a media relations program similar to our successful congressional and agency relations program. The goal of this effort is to establish the Society as a "go to" group with expertise when the media has questions about radiation safety issues.
- Greater interaction and collaboration with other societies.

What can HPS members do to aid you in your job as president?

McBurney: The work of the Society cannot be accomplished without the great team of volunteers who carry out all the diverse activities that are so important to keeping the Health Physics Society vital and at a high level of professionalism. To make sure this continues, HPS members can get involved in their local chapters, volunteer to serve on a national committee in an area that is important to them and/or in which they have particular expertise, volunteer to give a PEP course or present a paper at an annual or midyear meeting, or provide high-quality *Health Physics* Journal, *Operational Radiation Safety*, or *Health Physics News* articles. It is not always easy finding time to contribute to your profession beyond the routine job, but it is a gratifying experience if you can do it. I may also be calling on individuals at the local level who can attend meetings or public hearings of particular importance to the Society that may need immediate attention. As we try to grow the next generation of health physicists, we will need volunteers at the local level who can make presentations at a college or high school about the profession and to mentor interested young people. All of these individual efforts contribute to the overall status of the profession and the Society.

Mac and Ruth McBurney with Hsueh-Li Yin and Chuan-Fu Wu

What do you think is the most important issue facing health physicists today?

McBurney: Over the last several years, a continuing issue centers on the depletion of the number of professional health physicists. We have seen a dilution of the profession in the workplace as health physicists are given other duties in industrial hygiene, general safety, or administration. Also, the number of academic programs and the number of graduates in health physics has decreased. If the nuclear industry grows, there will need to be an assurance that there are adequately trained radiation safety personnel to make sure sources of radiation are handled safely and that workers and the public are protected.

What is the most important issue of concern to the HPS?

McBurney: I think the HPS can play a key role in addressing the human capital issue described above and to provide qualified health physicists to fill future demands. We need to assure that the training, funding, and mentoring programs are in place for developing new health physicists and that young people are made aware of the opportunities in the field of health physics. In order to do this, we need to bring together the key players working on this—from academic education, legislation and regulation, public education, and local outreach.

What do you see as the main function of the HPS over the next decade?

McBurney: As a professional scientific society, I see our role as assuring that the resources needed by professional health physicists in maintaining sound science in the practice of the profession are provided. This includes not only providing excellent meetings and continuing education, but also in supporting the future of the profession as discussed above—to assure that the demand for qualified health physicists is met as those of

us in the "Baby Boomer" generation retire. This will require a great deal of coordination among the leadership of the Society, the committees, and the chapters and support of the individual HPS members to sustain the membership and level of participation in HPS.

What have you liked most about being an HPS member?

McBurney: Of all the benefits of being a member of HPS, I think that interacting and networking with other members of the Society, both at the local and national level, has been the most enjoyable part. This has given me an opportunity to learn more about the profession from the standpoint of folks in other work-place environments and about new technologies and challenges. Through the interactions, I have also developed some lifetime friends and colleagues who have enriched my life and my career. I am also amazed at the commitment of the volunteers who continue to step up and accomplish the important work of the Society, as well as the staff of the Secretariat, journal, and newsletter.

Is there anything else you would like to say to HPS members as their new president?

McBurney: I really appreciate the confidence the membership has placed in me in electing me to this position. I am so pleased to be part of a great team of volunteers and staff that carry out all the important and diverse work of the Society. I am doubly honored to be serving in this milestone year as the 50th president. The Society has such a rich history of assuring a high standard of scientific practice in the field of radiation safety and I hope to continue to meet the high bar that many of my predecessors have set. I want to involve as many of the members as possible in participating in the activities of the Society and reaching the goals we have established.

Ruth and Mac McBurney

What is important in your life other than health physics and the HPS?

McBurney: I can sum up the important things in my life as faith, family, friends, and music. I have been blessed through the years with a lot of opportunities in both my personal and public life, and it's through the grace of God that many of these things have happened. Giving back through worship and volunteering is important to me. Mac, my husband of 34 years, and I enjoy visiting with family and friends and entertaining them at our house. We try to host one or two parties at Christmas time and sometimes go a little overboard in decorating (at least five trees). Although our families (siblings, nieces, and nephews) are scattered around the country, we enjoy getting together with them when we can, usually around a holiday.

We also enjoy traveling and seeing new places. My involvement with HPS has certainly given me the opportunity to travel; so much of our recent travel has been hooked on to work-related or Society travel, including the last two IRPA meetings in Japan and Spain and a week in Vienna.

We live in a house that some would consider large for just the two of us in a great neighborhood in Austin, which has a couple of parks and is near a lake. Maintaining the landscaping, the pool, the pond, and its "livestock" (40 goldfish) takes up some of my spare time, but I am also involved in the neighborhood garden club.

I mentioned that music is also important to my life in that, although I don't play any instruments and sing slightly off key, I enjoy writing radiation parodies. When certain health physics issues arise and are being discussed at meetings, sometimes I view these with humor and poetry set to known tunes. On the occasion of discussions of some particularly controversial issue, regulatory change, or current event, I have been known to make the statement, "I feel a song coming on!" Adding humor and sometimes poking a little fun at the profession also makes life more enjoyable. Mac plays the piano, so our house is a location for impromptu, or sometimes planned, sing-alongs, not of the parodies, but mainly old standards and carols at Christmas.

I have always been a "joiner" and enjoy working in teams with other people, whether it is in a professional organization such as HPS or the Conference of Radiation Control Program Directors, of which I am still an active member, or in volunteer organizations. There are always plenty of opportunities to contribute, serve, and excel, most of which are really rewarding experiences and usually lead to other great opportunities.

Outside the Corner Office

The Entrepreneurial Paradox (Part 1 of 2)

James M. Hylko

A colleague of mine (herein referred to as Doc) had a great idea for a new company. The company would specialize in providing a product, thereby filling the need of a specific niche market. Once the company started operating, Doc found himself working 14-16 hours a day. He knew that he could not keep working like this forever. So Doc decided to hire a few employees to help keep up with the administrative aspects of the company. Within a few weeks, Doc was beginning to enjoy the fruits of his labor, achieving balance between his personal and professional life. In addition, he could still interact with his clients directly and, as a result, would know exactly what his clients needed. He could then respond in a timely manner.

However, as more orders came in, the company began expanding internally. Doc found himself spending more time addressing internal company issues. To complicate matters, other companies were beginning to compete against Doc's company for new contracts. Since the marketing department (comprised of one employee) was falling behind in winning new contract awards, Doc believed he needed to spend more time in this area. He then assigned account managers, who were relying on phone calls and emails, to interact with the clients.

After surviving a turbulent start-up period, Doc's company had finally "leveled off" with regards to production and a reliable client base. However, he was finding it difficult to pursue new business opportunities since he was now spending most of his time managing company resources. It was at this juncture that Doc realized he had come face to face with the classic entrepreneurial paradox.

The Nature of Entrepreneurship

Entrepreneurial companies, also referred to as start-up companies, provide essential "job engine" opportunities during recessions, economic recovery, and booming markets. The entrepreneur who starts the company is someone who typically follows a three-step philosophy consisting of (1) perceiving opportunity, (2) believing pursuit of this opportunity will be profitable, and (3) believing that this opportunity can be achieved. This philosophy is necessary for the entrepreneur to start working, often in isolation at the beginning, until achieving success by either winning a new contract award or expanding an existing contract. What typically follows consists of creating an organization to perform the work. This implies hiring people, appointing them to different tasks, and making sure they perform as expected.

However, entrepreneurship is not enough. The importance given to entrepreneurship and start-up firms often obscures a very important fact, that is, it is very difficult for a small company to continue growing and become a larger, stronger competitor. Although a low-overhead organization can be efficient and respond in a timely manner, it may not be enough to be successful and survive for two reasons. First, no matter how brilliantly a company begins operating, losing its entrepreneurial spark can result in gradual decline. Second, a company must achieve a critical size and infrastructure to survive future competition. At this point in time, the company encounters the classic entrepreneurial paradox, that is, advancing through this critical stage of becoming "professional" at the expense of its entrepreneurial beginnings. Essentially, the company evolves into a professionally managed "little-large company" and often stops growing. This can be very risky. The ideal strategy is for both the entrepreneur and the company's employees to stay motivated by the pursuit of existing opportunities instead of becoming too focused on managing internal resources.

Contributing Factors of the Entrepreneurial Paradox

So why is it so difficult for an entrepreneurial company to ensure future growth and a strong competitive position? In the next issue, a colleague of mine, Russ Seely, Jr., MSW (Master of Social Work), who is also an entrepreneur, will discuss the contributing factors to the entrepreneurial paradox.

These factors often arise from the seeds of success and occur when either the entrepreneur or the company deviate from the original three-step philosophy.

CHP Corner

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Professional Standards and Ethics Committee

Carol D. Berger, Chair

The Professional Standards and Ethics Committee (PSEC), composed of Steven R. Frey, Debra McCroskey, Charles Meinhold, Cheryl Olson, and me, has had a busy year, relatively speaking. First, in January 2005 we issued a call for nominations for the Joyce P. Davis Award in the "CHP Corner." Unfortunately, however, no nominations were received. Nonetheless, we are optimistic that the 2006 call will have a different result.

Our second task was to review our existing procedures for continued applicability. The only procedure that we found applied to the PSEC was Standard Operating Procedure No. SOP 2.7.1, "Guidelines for the AAHP Executive Committee and the AAHP Professional Standards and Ethics Committee for Evaluation of Charges Alleging Violation of the Standards of Professional Responsibility for Certified Health Physicists" (Rev. 0). After giving it a good looking over, we determined that a few changes were necessary so we forwarded a proposed revision on to the American Academy of Health Physics (AAHP) Executive Committee for action.

Also, during our procedure review, we noted that there was no written procedure that addressed the general operations of the PSEC. Therefore, a new SOP No. 2.7.3, "Professional Standards and Ethics Committee Operations," was prepared and submitted to the AAHP Executive Committee for action.

Finally, the PSEC determined that there were no written instructions on soliciting and evaluating candidates for the Davis Award or on the issue of the award. Therefore, a new SOP No. 2.7.2, "Guidelines for the Selection of the Joyce P. Davis Award Winners by Professional Standards and Ethics Committee," was prepared and submitted to the AAHP Executive Committee for action.

Help Needed

The Academy is updating its Strategic Plan and needs your input! Please visit this Web site http://www.hps1.org/aahp/membersonly/asp_survey and give us your ideas and opinions. (No, you do not have to read the current Strategic Plan!)

Remember a strategic plan is like a pie—you can't make a good one unless you put in good ingredients.

Your input is needed by 15 November. After that the pie comes out of the oven.

ABHP Examination No. 1 – June 1960

During this year's annual Health Physics Society meeting in Spokane, Washington, Editor Kleinhans was provided a copy of the first American Board of Health Physics Examination given in June 1960. Look for questions from this exam in future "CHP Corner" pages, as space allows.

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 October will be printed in the December issue.

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

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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

The GE Radiation Monitor (early 1950s)

In the following quote, taken from Kathren and Ziemer's *Health Physics: A Backward Glance*, Dale Trout describes what led him to develop this instrument: "I became aware of the fact that two things always seemed to happen [with radiation detectors]. The batteries were dead and somebody had lost the instructions. So George Shulte and I who were interested in this [field of] radiation protection, made an instrument which we thought was a great one; and, boy, we lost our shirts on it. . . . The reading element was a quadrant electrometer . . . We charged it by rolling a bubble of mercury down an evacuated tube; we didn't have any batteries to run down you see, and we put the instructions on the inside of the chamber. To do away with the instructions, you had to bust it. . . . We sold these things for $39.50 and believe me, they fell flat. Two things I'm sure happened. No health physicist would be caught having his picture taken without a cutie-pie . . . [and] nobody believed that you could make anything for $39.50 that would work . . . we scrapped 3,000 of them."

Upcoming Events

39th Health Physics Society Midyear Topical Meeting
http://hps.org/newsandevents/meetings/meeting9.html
22-25 January 2006
Scottsdale, Arizona

2006 HPS Summer School
"Medical Health Physics"
http://nechps.org/SS06/ss06.html
18-23 June 2006
Brown University
Providence, Rhode Island

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

NCRP 2006 Annual Meeting
"Chernobyl at Twenty"
http://www.ncrponline.org/
3-4 April 2006
Crystal City Forum
Arlington, Virginia

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

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