

# The Billet

The Newsletter of the South Texas Chapter – Health Physics Society

July 10, 2000

Web site: <http://www.stc-hps.org>

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#### **President**

Ian S. Hamilton  
Texas A&M University  
College Station (979) 845-8101  
[ian@trinity.tamu.edu](mailto:ian@trinity.tamu.edu)

#### **President-Elect**

Susan M. Jablonski  
TNRCC  
Austin (512) 239-6731  
[sjablons@tnrcc.state.tx.us](mailto:sjablons@tnrcc.state.tx.us)

#### **Past President**

David B. Fogle  
TDH Bureau of Radiation Control  
Austin (512) 834-6688  
[david.fogle@tdh.state.tx.us](mailto:david.fogle@tdh.state.tx.us)

#### **Secretary**

Pete Myers  
TDH Bureau of Radiation Control  
Austin (512) 834-6688  
[pete.myers@tdh.state.tx.us](mailto:pete.myers@tdh.state.tx.us)

#### **Treasurer**

Michael A. Charlton  
UTHSC at San Antonio  
San Antonio (210) 567-2955  
[charlton@uthscsa.edu](mailto:charlton@uthscsa.edu)

#### **Executive Council**

John M. Salsman  
Rogers & Associates Eng. Corp.  
New Braunfels (210) 629-9112  
[jms@raecorp.com](mailto:jms@raecorp.com)

James A. Lewis (Jim)  
UTSA  
San Antonio (210) 458-5807  
[jlewis@utsa.edu](mailto:jlewis@utsa.edu)

Christopher W. (Chris) Maxwell  
Ludlum Measurements, Inc.  
Sweetwater 1-800-622-0828  
[Cmaxwell@camalott.com](mailto:Cmaxwell@camalott.com)

#### **Editor**

John P. Hageman  
Southwest Research Institute  
San Antonio (210) 522-2633  
[jhageman@swri.org](mailto:jhageman@swri.org)

#### **Managing Editors**

Alana Woods (210) 522-3760  
Southwest Research Institute  
San Antonio  
[awoods@swri.org](mailto:awoods@swri.org)

#### **Technical Editor**

David Norman  
NORM-Rad Services  
Graham (940) 549-6578  
[David.Norman@norm-rad.com](mailto:David.Norman@norm-rad.com)

## Testimony Before the House Committee on Environmental Regulation

Warren Chisum, Chairman  
Ray Allen, Vice Chairman

Presenter: Margaret N. Maxey, Ph.D.

03 May 2000

*Petroleum/CPE 3.168*

Mr. Chairman and Members of the Committee: I wish to express my appreciation for the opportunity to present this testimony.

My name is Margaret Maxey. Since 1982 I have served as Professor of Bioethics in the Biomedical Engineering Program in the College of Engineering at The University of Texas at Austin. I also serve as Director of the Clint W. Murchison Sr. Chair of Free Enterprise. My doctoral degree in Christian Ethics was conferred by Union Theological Seminary in New York after earning two masters degrees in philosophy and theology, respectively.

[A prefatory note about the origin of my interest in this issue: It was in 1975 that I first became involved in the public debate about issues related to uses of radioactive elements applied to medicine and energy production. At the invitation of the National Council of Churches (NCC), I was asked to serve on a panel with two other professional ethicists conducting an examination of the NCC's proposed document on radioactive sources of energy. At this public consultation – without any prior knowledge of each other's positions – we three ethicists unanimously concluded not only that the NCC document was “a set of fears passed off as facts,” but that it would become an embarrassment to the Churches – reminiscent of religious condemnations of Galileo's scientific discoveries centuries earlier. The conclusions we reached at the 1975 Consultation have not changed. Indeed they have become reinforced by public debate in the State of Texas over the site location and licensing of a repository for low-level radwastes.]

The comments I have prepared for this Hearing are intended to be brief and limited to considerations focused on two major ethical issues relating to the protection of public health in licensing a site and regulating exposures to low-level radwastes. After summarizing each issue, I wish to examine the questionable scientific presuppositions upon which they are dependent.

The first ethical issue is by far the most emotionally charged: environmental racism. In both media reports and popular literature, it is simply assumed that radwaste products – even those with extremely low levels of activity – confront us with unique and unprecedented hazards. They are referred to as “a million-year risk,” a “Faustian bargain” made by energy junkies and moral pygmies. Those who have voiced total opposition to any site selected for the disposal of radwastes argue that human rights would be violated because officials deliberately select locations inhabited by poor, indigent, defenseless members of society who have neither the time nor resources nor organizational skills to combat the overwhelming powers of big business and big government arrayed against them. Discounted as racially expendable, the victimized poor are allegedly threatened by lethal exposures not only from the transporting of radwastes through their communities,

*(See TESTIMONY on page 2.)*

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**TESTIMONY***From front page.*

but from their duration through mind-boggling time-scales used to measure their continuing presence and pollution of land and, eventually, groundwater supplies.

Accusations about environmental racism (whether or not they are justified) stand or fall on a single assumption: that radioactive wastes, even those of extremely low-level activity, are a unique threat to the public safety and health of anyone living in the vicinity of their disposal. They can never be managed “safely” for two reasons—(1) The length of half-life of radwastes far exceeds human abilities to manage them, and (2) There is no safe dose of radiation; every radiation dose is an overdose.

Closely related to the first issue is a second contention that a “new ethical paradigm” is needed to govern public policy. Its primary pillar is a so-called precautionary principle: “There shall be no trials without prior guarantees against error.” This principle has been popularly stated as “Better safe than sorry!” or “Better to err on the side of caution!”

Ordinary caution is, of course, often appropriate and commendable. But those who invoke this principle have declared that it require a “reverse burden of proof.” In other words, it is up to those who claim that a product or process is “safe” – because it poses no threat to human health – to prove beyond reasonable doubt that it actually is “safe.” Otherwise, responsible authorities cannot be allowed to grant permission for the procedure to continue. This reverse onus principle entails what is called “the double bind”: No procedure can be done until it is proven safe; and nothing is proven safe, because no procedure can be done.

Common sense reminds us that science itself would long ago have been halted and abandoned if a “precautionary principle” and “reverse burden of proof” had been allowed to dominate modern civilization. But more importantly, this principle and “double bind” mindset submerge us in a local impossibility. Without trial and error – without experimentation, verification, and replication – we would forfeit the very goal which advocates of the principle intend to achieve with it – “safety.” There can never be an absolute proof or safety of “harmlessness” because it requires proof of negative – proof of the absence of an unknown – a logical impossibility.

Having stated these issues in the abstract (without reference to specific problems confronting those with legislative responsibilities for siting and managing low-level radwastes), I ask you to consider a common thread of ethical reasoning that brings us to the heart of the matter.

These issues would not even exist in our public discourse if it were not for the fact that a deep moral conviction has become instilled in many consciences – namely that radioactivity and its man-made applications are utterly unique, virtually unmanageable, and immoral in their health effects. Why? Because of a simple hypothesis – not a scientific fact, but a mere hypothesis: the linear, no-threshold hypothesis.

When radiation research was in its infancy during the 1950s, it was at that time deemed administratively useful to assume that harmful health effects of radiation exposure decreased with dose, all the way down to zero health effects at zero radiation. Scientists simply assumed that there was no threshold below which they could be certain no significant harm could exist. This was the birth of the LNT model. Careers have been built on it. Bureaucratic empires would wither and die without it.

Subsequently, as data was compiled about third generation A-bomb survivors, scientists found absolutely no detectable inherited radiation damage. Moreover, any added cancer incidence traceable to low-level radiation – even if it existed – was too small to detect. (T. Rockwell)

Once radiation professionals had provided straightforward, adequate radiation protection standards and instrumentation to prevent high-level exposures, they began to focus attention on low dose exposures. These early “health physicists” – as Theodore Rockwell reminds us – were either physicians or physicists, and seldom biologists. Hence, they were less sensitive to problems that arose from their assumption that biological damage caused by a very high dose rate (“in a flash”) was quantitatively equal to a low chronic dose received slowly over months or years.

At the time it was simply assumed, in effect, that if a person takes one aspirin tablet per week for 100 weeks, it will be just as lethal as taking 100 aspirin tablets all at once – clearly absurd. When dose rates are low, any damage has time to repair and heal.

Gunnar Walinder, a Swedish radiobiologist, has recently published a book titled, *Has Radiation Protection Become a Health Hazard?* In it is stated unequivocally: “The linear, no-threshold hypothesis is one of the greatest scientific scandals of modern times.”

His bold statement is indicative of a significant sea-change now occurring among radiation experts. They are currently in the process of reassessing the validity of continuing to use the LNT hypothesis as a basis for setting standards in radiation protection. Your committee should be kept aware of this ongoing process.

Moreover, as this committee reviews the standard-setting process adopted by the Texas Department of Health, and makes comparisons with other states, it would be wise to exercise a legitimate degree of caution.

It is ethically dishonest to claim that the LNT hypothesis is an unassailable scientific conclusion, when in fact it is only an inconclusive theory, an ultraconservative model of prudence whose usefulness has expired. It ignores the fact that humans could not exist if the LNT hypothesis were applied to and enforced upon personal lifestyle exposures to natural terrestrial and cosmic radiation. Evidence of human exposure to wide variations in natural background radiation ought to compel our regulatory agencies to set standards based on “standard deviation from background.”

In conclusion, it is noteworthy that an official decision about the siting and licensing of a low-level radwaste repository in the State of Texas has been held hostage by a wide range of diverse political interests. However, each has a common stake in magnifying the yardstick of radioactive half-life as a means to dictate enormous financial costs over indefinite time scales required for assuring the public of “safe” disposal.

If legislators were to succumb to selecting environmental hazards in terms of the half-life or rate of decay of toxic elements – or their potential for lethal doses to a population—then you should long ago have undertaken permanent geological burial of mercury, lead, arsenic, chromium, and countless other substances whose half-life is infinite. They will never continue to remain in the biosphere forever. This is fortunate, because they are valuable and expertly-managed resources from which we derive countless benefits.

(See TESTIMONY on page 10.)

## New STC – HPS Members

*Submitted by Jim R. Sharp  
Chairman of the Membership Committee*

The South Texas Chapter wants to welcome the following new members to the chapter:

Matthew Arno	Student, TAMU, College Station
Greg Broda	Waste Control Specialist, Andrews
Mike Dunn	Bureau of Radiation Control, Austin
Kenneth J. Ellis	Baylor College of Medicine, Houston
Eugene Forrer	Bureau of Radiation Control, Austin
Agapito C. Gaytan	South Texas Project, Nuclear Operating Company, Wadsworth
Danny Ray Jisha	Bureau of Radiation Control, Austin
Ryan DeBouf	Student, UT-Austin
Dmitri Medvedev	Student, TAMU, College Station
Pavel Medvedev	Student, TAMU, College Station
Natalia G. Medvedeva	Student, TAMU, College Station
Kitz Parker	Numed, Inc., Denton
David G. Perales	UT Health Science Center - San Antonio
John R. Pickett	Numed, Inc., Denton
Aileen D. Rodriguez	PSJA, Teen-Parent Program, Pharr
Barbara Taylor	Bureau of Radiation Control, Austin
Lesley Urasky	Science Academy, STISD, Mercedes
David Wood	Bureau of Radiation Control, Austin

Also, the following new members who belong to the National HPS are

Steven H. Allen	Atomic Energy Industrial Laboratories, Houston
Bruce Bristow	Radiation Consultants, Inc., Deer Park
Steve Cima	U.S. Army, San Antonio
Randal A. Cords	Metrica, Inc., Brooks AFB, San Antonio
Sam H. Daniel	South Texas Project, Nuclear Operating Company, Wadsworth
Lucile Dauffy	Student, TAMU, College Station
William C. Davis	St. Philips College, San Antonio
Gilbert L. Guerra, Jr.	Bay City
David Jones	Scott & White Hospital, Temple
Jim Kirkwood	Houston
Peter G. Lakey	Fort Hood
Dr. Margaret N. Maxey	Austin
Milton E. McLain	Kerrville
Gerald T. Powell	South Texas Project, Wadsworth
Richard R. Rogus	CH2M Hill, San Antonio

The Admissions Committee reports that the final paid membership for 1999 was 220, and the current paid membership for 2000 is 215.

## New Lapel Pins for the STC

*Submitted by Jim R. Sharp  
Chairman of the Membership Committee*

The layout of the proposed South Texas Chapter lapel pin was faxed to Mr. Richard Burk at the National Health Physics Society office. An email was received from Mr. Burk stating that the logo is acceptable, and that the Chapter could proceed with plans to have the pins made.

Jim Sharp called Toastmasters International in California for information about who makes their lapel pins and was given the name of the Willdo Company to get a price quote.

## STC Membership Directories

*Submitted by Jim R. Sharp  
Chairman of the Membership Committee*

The latest results of the survey about the preferred format for the Chapter Directory are as follows:

Paper	71
Disc	15
CD	27
Don't Care	7

Several of the requests for disk and/or CD formats stated specific software required for their particular system. If this request could not be supplied, then the preferred second choice was paper.

The next directory update will be printed in June 2000. We are waiting to receive any updated and/or new ads from the Chapter's Affiliate Members. A letter to each Affiliate Member was mailed by the Affiliates Committee requesting the ads.

## Upcoming Meetings

*Submitted by John Hageman*

- June 27, 2000—7 a.m., Annual Breakfast Meeting in Denver, Colorado
- August 12, 2000—Austin, Texas, or Kemah Resort
- November 11, 2000—Galveston, Texas
- Dec./Jan. 00/01—San Antonio Affiliates Fair

## The Billet Deadlines

- September 7, 2000, (September 15th electronic media) for the October 12, 2000, issue
- November 17, 2000, for the December 14, 2000, issue

## TRAB RECOMMENDATIONS

*The following article is taken from the ARDT News (Advocates for Responsible Disposal in Texas) Newsletter, dated March–April 2000.*

The Texas Radiation Advisory Board (TRAB) met to consider the length of time a company should have to store low-level radioactive waste. On Friday, March 10, 2000, the Waste and Industrial Committee was convened by Committee Chair, Jimmy Barker, who stated that the Committee would look at permit terms for storing radioactive waste. Dr. Krohmer, TRAB Chair, echoed Mr. Barker's charge adding whether assured isolation is a viable solution to the waste problem and to consider the Compact requirements. Invited testimony was heard.

Annette Glass, Committee Clerk for the House Committee on Environmental Regulations, testified that Representative Chisum does not want to eliminate options but wants to increase options by adding assured isolation. She said that the disagreement during the last legislative session was over DOE waste burial at private facilities. Ms. Glass further testified that Representative Chisum is firm on the State being the holder of the license for the Compact facility. She invited any interested parties to participate in upcoming hearings.

Tim Powell, South Texas Project Nuclear Operating Company, testified that two possible options are available for the disposal of low-level radioactive waste: (1) below ground, and (2) assured isolation. Below-ground disposal would be the optimal solution because it provides final resolution of the problem, and complies with federal legislation. He also said, "We believe the existing process should be modified through privatization . . ."

Douglas Kay, TXU Electric, testified, "We believe either method (below-ground disposal or assured isolation) could potentially provide a technically safe and suitable method for long-term disposal and/or management of the waste. However, we would only support assured isolation or 'decay in place' methodology after it is determined to meet legal and political requirements of the compact . . . and the State takes title to the waste." Mr. Kay also supported privatization.

Dr. Jose Lopez, UT Southwestern Medical Center, testified that future volumes of waste cannot be predicted because of the nature of research. Chris Meyer of Texas A&M University pointed out that it costs \$2,500 to send one barrel of waste to South Carolina's waste disposal facility. Ralph Heyer of TN Technology reminded the committee that the five-year contingency plan started 20 years ago, while Tom Kerr of the Department of Energy testified that the design life of a facility should exceed the period of possible inattention due to war, etc., and felt 30 to 50 years was reasonable.

Richard Ratliff presented the TRAB staff's summary. The most limiting factor on length of storage is the financial security of the operator. Pennsylvania's low-level radioactive storage rules

should be investigated since NRC approves of them. Wastes with half life of 10 years or less should be separated from those with a half life of more than 10 years.

The TRAB Committee members discussed at length financial considerations, length of time from 25 to 100 years, and forming a subcommittee to study assured isolation.

Public comment focused on several topics: the utilities storing their own waste and assuming liability, objection to private companies holding license, keeping waste where generated, adequate oversight, and separation of short and long-lived waste.

On April 15, 2000, the Waste Committee convened with the full TRAB. The Committee discussed long-term storage requirements, financial security, and technical requirements. The following are the main points:

- A solution to the LLRW disposal question is needed.
- The State of Texas should take title to the waste and hold the license.
- A private company should operate the site with financial assurance provided for the State of Texas and the original generators.
- The facility should be located where current siting requirements are met.
- Assured Isolation should be one of the options considered for the Texas, Maine, and Vermont Compact facility.
- Only one LLRW storage/disposal site should be developed for the State of Texas.
- A site should be selected where the public is supportive. The state should be proactive in providing the local public with factual information so they can make an informed decision.

The TRAB's recommendation to the Bureau of Radiation Control (BRC) is as follows:

"While TRAB feels strongly that Assured Isolation should be pursued as an option for the State of Texas, we do not believe the Texas Legislature envisioned a storage period of several hundred years. Therefore, we recommend that the BRC use a life facility design for up to 160 years."

The basis for recommendation was an expected 40-year operational life of the facility, plus an additional 120-year period to allow for a majority of the waste to decay to background radiation levels. In making this recommendation, TRAB supports a license for processing/storing LLRW to be issued for seven years, to be renewed at the end of that time. Facilities would be inspected every six months.

## SOUTH TEXAS CHAPTER

### *Longest-Standing, Continuously-Active Member*

*By Karen Myers, Public Relations Chairperson*

Longest-standing, continuously-active will be a new featured article that will appear in *The Billet*, designed to acknowledge those Chapter Members who remain faithful. Our first choice is Ed Bailey who has been a Chapter Member since 1965.

Ed was born in Jacksonville, Texas, on December 29, 1940. He grew up in Rusk, Texas. As to why he wasn't born in Rusk, the only hospital there at that time was a State Mental Hospital. After graduating from Rusk High School, he entered the University of Texas where he earned a Bachelor of Engineering Science Degree in 1965. He continued to further his education with a Masters in Environmental Health Engineering in 1967, also at the University of Texas.

Ed became interested in health physics/radiation safety during one of his nuclear reactor design courses as an undergraduate. It was further amplified when he was offered a PHS Traineeship in Radiological Health, which allowed him to go to graduate school rather than immediately into the Army following his completion of his Bachelor's degree. While in graduate school, he worked as a

health physicist at Texas Nuclear Corporation—that job probably was responsible for his *real* interest in health physics.

When asked to share some of his memories of the STC, Ed said, "Most of us 'oldtimers' will never forget the days when the STC was praying that we would take in enough money to pay for that meeting—several times we did not. The old days were when meetings were held primarily for the social events (such as keg floating and skinny dipping), and the papers were secondary." He has maintained his membership in the STC so that he could keep somewhat in touch with what old friends and colleagues were doing and to whom they were doing it. He has maintained his membership in National because of his interest in health physics as a profession. He is currently serving as President of the Northern California Chapter and on the Board of the Southern California Chapter, in addition to his activities with the ABHP and the AAHP.

Ed presently lives in California with his wife, Darice, and their daughter, Caitlyn (7).

## Science Teacher Workshop Presented to 21 in Mercedes, Texas

*Submitted by Karen Myers, Public Relations Chairperson*

What a wonderful experience ... driving to south Texas in the spring, especially when it's in conjunction with presenting a Science Teacher Workshop (STW) to an audience of 21 interested and inspirational science teachers on April 1, 2000.

Believe it or not, our trip to Mercedes, Texas (just west of Harlingen; seven miles from Mexico), began at the other end of Texas—in Lubbock. Lori Hamilton, one of the teachers who attended our STW in Lubbock at CAST 2000 (see *The Billet*, Volume 21, Number 1; January 6, 2000), contacted then-President David Fogle and took him up on the STC's standing offer for the STC to present its STW any place in the STC's region—and folks, we are the **\*SOUTH\*** Texas Chapter.

So, invitation accepted, President Fogle turned to ever-ready Eva Legler, then the STW Chairperson, who did her typically excellent work in preparing yet another STW (is this four? five?). Joining Eva in making this a very successful and special event was Karen Myers, who assisted with registration and provided administrative support, and members of the STC whose presentations and answers to questions greatly enhanced the teachers' understanding of radiation and radiation safety.

Bob Emery, Master of Ceremonies

Ian Hamilton, presenting "Fundamentals of Radiation"

Pete Myers, presenting "Biological Effects of Radiation"

John Salsman, presenting "Exposure to Radiation in Life"  
Susan Jablonski, presenting "Radioactive Waste Management"

Armed with newly acquired understanding, a teacher's manual, grade-level-focused lesson plans, computer programs, and a radiation detection instrument, the STC hopes and expects that those 21 teachers will be much more capable of presenting their students with science-based information on radiation and how the wise and careful use of radiation results in major benefits to our society, along with very minimal and manageable risks.

Workshop completed, Eva Legler presented Ms. Harrison with a thank you gift from the STC, for making the arrangements for us to go to the Science Academy in Mercedes to present the workshop. The Science Academy is a magnet facility where students with interest and aptitude in science are enrolled. Unexpectedly, Ms. Harrison returned the favor by presenting each STC participant with a t-shirt from her school and a plant that had been cultivated by the school's special education students.

The return to more-central Texas, for some STC participants, may not have been direct ... as the charms of Port Isabel and South Padre Island were difficult to resist ... then, after a must-stop at a roadside produce market to pick up a few valley-ripened mangos, oranges, and grapefruit, reminiscences of our wonderful experience in Mercedes made the trip home very enjoyable.

# SUMMER MEETING

**SOUTH TEXAS CHAPTER OF HEALTH PHYSICS SOCIETY, INC.  
DOUBLETREE HOTEL  
6505 IH 35 North, Austin, Texas**

**AUGUST 12, 2000**

## **Regulatory Conference The Next Millennium**

**Featuring**

**A Luncheon Presentation by Margaret Maxey, Ph.D.  
Professor of Bioethics, Director of the Murchison Chair of Free Enterprise,  
Biomedical Engineering Program, College of Engineering, UT–Austin**

Continuing the partnership established many years ago between the South Texas Chapter of Health Physics Society, Inc. (STC) and the Texas Department of Health, the 2000 Regulatory Conference continues the tradition of providing for better understanding and education in radiation protection and safety. The intrinsic value of the Regulatory Conference will remain in place while the format has been modified to emphasize the “do more (improved quality and quantity of presentations) with less (time factor)” mantra of the times. Instead of concurrent, conflicting sessions that invariably resulted in loss of value and education, the general session has been expanded to be inclusive of broad scope topics of value and use to all attendees. The STC is proud to continue this educational mission in support of our Charter and Bylaws and for the benefit of our membership.

In giving a thought-provoking and entertaining presentation before the 1997 national Health Physics Society Meeting in San Antonio, Texas, Dr. Margaret Maxey energized and fascinated health physicists from around the world. The opening program, highlighted by Dr. Maxey’s presentation, signaled the beginning of a very successful meeting for the Chapter on the national level. The STC is fortunate to host Dr. Maxey at this conference. In the true style that has accentuated her previous presentations, Dr. Maxey offers her unique perspective on the Linear-Non-Threshold controversy. You will not want to miss this one!

**6.0 CEUs Awarded for  
LMP and MRT Certifications**

### **Agenda**

**Friday, August 11, 2000**

6:30 – 10:00 p.m. Executive Council Meeting, Room TBD

**Saturday, August 12, 2000**

Emergency Messaging During the Meeting – (512) 454-3737

9:00 a.m. Welcome  
STC President-Elect Susan Jablonski

9:10 *Overview and Update on  
State and Federal Activities  
Impacting Radiation Control and Health Physics*  
Richard Ratliff, Chief, Texas Department of Health–  
Bureau of Radiation Control (TDH–BRC)

9:40 *Update on Regulatory Activities at the  
Texas Natural Resource Conservation Commission*  
Representative of the Texas Natural Resource  
Conservation Commission

10:00 *Specific Update of Low-Level Radiation Waste  
Management Issues Related to Texas Regulations*  
Susan Jablonski, LLRW Study Program  
Texas Natural Resource Conservation Commission

10:30 Break—Coffee, Assorted Hot Teas

10:50 *What Texas Health Physicists and Licensees  
Should Know About the Texas Radiation  
Advisory Board (TRAB)*  
Dr. Dale Klein, Chairman, TRAB  
Vice Chancellor for Special Engineering Programs  
The University of Texas System

11:05 *Texas Department of Health  
Sunset Regulatory Review*  
Art Tate, Director  
Division of Compliance and Inspection, TDH–BRC

11:30 *Saving Licensee Money and Resources:  
Getting to the Root Cause of Noncompliance*  
Bob Emery, Assistant Director of Research  
The University of Texas – Health Science Center, Houston

12:00 p.m.	Lunch with Distinguished Speaker  <b>Margaret Maxey, Ph.D.</b> <b>Professor of Bioethics</b> <b>The University of Texas at Austin</b> <b>“Radiation Science: Gnats, Camels, and Heroes”</b>  <i>Luncheon Fare</i> Grilled Chicken Breast on Penne Pasta with Artichokes Grilled Portabella Mushrooms and Smoked Mozzarella in Roasted Tomato Sauce Farmer’s Market Salad Fresh Rolls with Butter Cherry Pecan Strudel with Vanilla Cream Iced Tea and Coffee	2:00	<i>Overview of Changes in State and Federal Nuclear Medicine Regulations</i> Ruth McBurney, Director, Division of Licensing Registration & Standards, TDH–BRC
		2:25	<i>Applications of Veterinary Nuclear Medicine: Special Patient—Thai, the Elephant</i> Ray Jisha, Chief Medical and Academic Licensing Program (TDH–BRC)
		2:55	Break—Coffee, soda, baked goods
		3:15	<i>Licensing Issues for the Millennium— New Challenges</i> Pete Myers, Deputy Director Division of Licensing, Registration & Standards, TDH–BRC
1:30	<i>New and Proposed Texas Department of Health Rules</i> Cindy Cardwell, Deputy Director Division of Licensing, Registration, & Standards, TDH–BRC	3:35	<i>A Guided Tour Through the License Amendment Process</i> David Fogle, Chief Industrial Licensing Program, TDH–BRC
		4:00	Break
		4:10	Business Meeting of the South Texas Chapter

## ACCOMMODATIONS

**DoubleTree Hotel—Austin**  
**6505 North IH35**  
**Austin, Texas**

**For Reservations: (512) 454-3737**

**[www.hilton.com/doubletree/hotels/AUSLNDT/index.html](http://www.hilton.com/doubletree/hotels/AUSLNDT/index.html)**

**Executive Rooms and Suites available**

A block of rooms has been reserved for Friday, August 11, 2000, and Saturday, August 12, 2000, *until July 18, 2000*, under the name Texas Radiation Regulatory Conference. Room rates will be \$70 per night single or \$110 per night double occupancy. In order to secure these rates you must call the reservation telephone number listed above and specify that you are with the Texas Radiation Regulatory Conference. After *July 18, 2000*, reservations will continue to be accepted based strictly on room availability; however, extension of the \$70 rate will be unavailable. Therefore, make your reservations early!

### **DoubleTree Amenities**

- Executive Rooms and Suites available
- Courtyard Pool
- Fitness Center
- Premium cable TV, pay-per-view, HBO, CNN, and ESPN
- In-room coffee makers, hair dryers, irons, and ironing boards
- Guest Pool Table; Complimentary Beverage for guests
- In-room voice mail and video messaging
- Internet access in guest rooms
- Two telephones and two telephone lines in guest rooms

## Registration

**Please submit a registration form for each member or guest attending the meeting and mail to the address below.**

### 2000 Summer Meeting DoubleTree Hotel Austin, Texas

Attendee's Name \_\_\_\_\_

Attendee's Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

STC Member (technical sessions and luncheon) — \$40 “☺”

STC Member (technical sessions **ONLY**) — \$30 “☹”

Non-STC Member (technical sessions and luncheon) — \$50 “☺”

Non-STC Member (technical sessions **ONLY**) — \$40 “☹” “☺”

Student (technical sessions and luncheon) — \$10

Need a receipt for this meeting

Need CEU certificate

**Pre-registration will close on AUGUST 2, 2000.** If you will not be able to attend the meeting, please call and cancel your reservation **PRIOR TO August 2, 2000.** Any reservation **not cancelled by August 2, 2000,** will be regarded as a confirmed reservation, and monies will be collected for the meeting. Refunds will be honored only for **cancellations made before August 2, 2000.** Registration fees collected **after August 2, 2000,** or at the door, if space is available, will be \$10 extra.

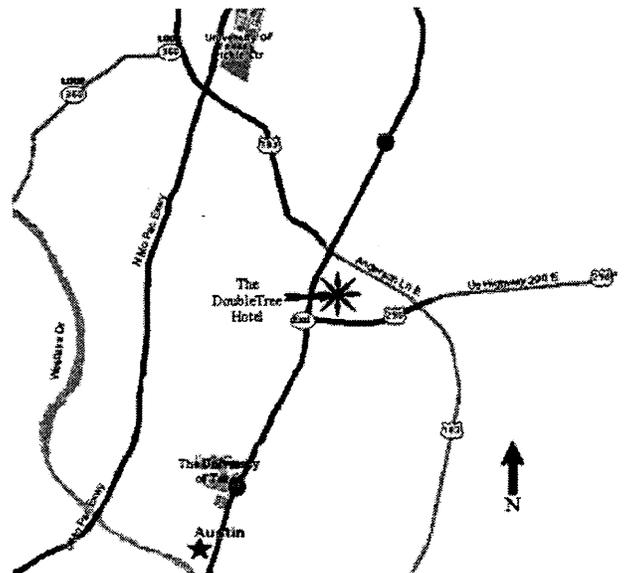
☹ This price **DOES NOT** include lunch. If contemplating on-site purchase, meeting space and lunch cannot be guaranteed on the day of the meeting.

☺ Nonmembers may select option of applying for South Texas Chapter – Health Physics Society membership at the meeting and enjoy privileges of membership at future Chapter events.

### Directions to Hotel

The DoubleTree is directly off of IH 35 northbound access road. Coming from the south, take the St. John's Exit. The DoubleTree will be on the access road on the right. Coming from the north, take the 290 East Exit, and take the turnaround to the northbound access. The DoubleTree will be on the access road on the right.

### Map



## HOUSE ENVIRONMENTAL REGULATIONS COMMITTEE MEETS MAY 3, 2000, TO DISCUSS LOW-LEVEL WASTE ISSUES

*Ian Scott Hamilton and Susan Jablonski*

The Texas House Environmental Regulations Committee, chaired by the Honorable Warren Chisum (R – Pampa), met at the State Capitol Building Extension on May 3, 2000. The published agenda included invited and public testimony on low-level radioactive waste issues in Texas. Members of the Texas Department of Health (TDH), Texas Natural Resource Conservation Commission (TNRCC), Bureau of Radiation Control (TDH-BRC), and Texas Radiation Advisory Board (TRAB) presented statements to the committee. Representatives of the two Texas reactor facilities, a radiopharmaceutical production firm, a commercial waste disposal firm, and the Sierra Club also entered statements into the public record. Dr. Margaret Maxey of the University of Texas provided invited testimony on the ethics of radiation exposure and waste disposal (see elsewhere in this issue of *The Billet*). Members of the public from potentially affected communities (those counties wherein a site might be constructed, or adjacent counties) also provided testimony. President Hamilton represented the South Texas Chapter by extending the technical resources of our membership to the Committee.

Several issues concerning low-level radioactive waste management received the greatest attention. First, questions were raised as to whether the State of Texas should hold the facility license and maintain title and responsibility for disposition of waste generated within the Texas Compact states. Second, there were statements about the type of waste management facility that should be constructed—disposal or long-term storage? Other questions entered into the public record included speculation about legal ramifications of waste management options, the

possible locations of facilities, and the opportunity for public involvement prior to any siting decisions in Texas.

The TRAB Chairman and the Chairman of the Industry and Waste Committee of the TRAB both provided invited testimony on the issues. The TRAB reported on the recent recommendation for a design life period of 160 years, or approximately ten half-lives of tritium plus a forty-year operating period, as an appropriate period for long-term storage facility design (see elsewhere in this issue of *The Billet*).

Testimony from many of those speaking focused on the subject of facility siting. Some individuals speaking about various environmental concerns felt that any state-sponsored radioactive waste facility should be constructed on one of the reactor sites in Texas. Others stated opinions centered on construction of a separate management facility somewhere else within Texas. Finally, some members of the public requested that the Committee consider passage of a requirement for a multi-county referendum prior to finalizing any siting decision. This idea was based on the opinion that it should take a regional, multi-jurisdictional vote of approval prior to any such decision.

The Committee plans to take these and many other statements under advisement. The South Texas Chapter was well represented, as were the radiation protection educational programs throughout Texas. We are hopeful that the word is now out that South Texas practitioners of radiation safety are ready and willing to “take up the call” to help our elected officials as they wrestle with this complex problem.

## Myers Honored During TDH Ceremony

*David B. Fogle, STC Past-President*

In ceremonies conducted in the Board of Health Conference Room on May 17, 2000, South Texas Chapter (STC) Secretary Pete Myers was awarded “The Moment of Truth Award” by Texas Department of Health (TDH) Commissioner William Reynolds “Reyn” Archer, III, M.D., in recognition of his community involvement with the STC. The ceremony was conducted during the regular meeting of the Board of Health with Chairman, Walter D. Wilkerson, Jr., M.D. Presiding. The Moment of Truth Award is designed to recognize individuals who provide exceptional service to TDH customers, both internal and external.

The following was recited during the award ceremony.

Mr. Myers was invited by the South Texas Chapter of the Health Physics Society to participate as an invited speaker and material reviewer for one of the Chapter’s Science Teacher Workshops (STW). During a STW, presentations, materials, lesson plans, and audio and visual aids are provided to science teachers throughout the State of Texas. Presenters at STWs educate science teachers about radiation safety, good health physics practices, and rules and regulations regarding the safe use of radioactive material and x-ray devices. Ultimately, attending science teachers return to school



*Texas Department of Health Commissioner William “Reyn” Archer, M.D., presents STC Secretary Pete Myers with “The Moment of Truth Award” while Texas Board of Health Chairman Walter D. Wilkerson, Jr., M.D. looks on.*

armed with knowledge, lesson plans, and classroom demonstrations, which are used to properly educate the children of the State of Texas about the facts of radiation.

Mr. Myers purchased a computer and scanner to facilitate his work on the STW lesson plans, reference materials and handouts that

*(See MYERS on page 13.)*

**TESTIMONY***From page 2.*

I strongly support the selection of a private entity, scientifically qualified to manage low-level radwastes, as the most reliable choice for an efficiently-managed, cost-effective repository. Private ownership and management would alleviate the tax burden which bureaucratic empire builders would require.

Once the State of Texas has taken title to low-level radwastes, a license can be granted to a private facility using sound scientific principles as a guideline for an achievable goal: Assured Isolation with optional retrievability for a period of 120 years to assure that longer-lived isotopes will have receded below background levels.

Legislators who support adoption of this proposal can be confident that their ethical responsibilities have been met. Citizens of Texas must cease using unjustified moral claims as a way to escape their ethical responsibilities for radwaste disposal. All wastes – chemical or radioactive or whatever – are an inescapable byproduct of the society in which we live and thrive and enjoy countless benefits. Ethical judgments, based on the preponderance of valid scientific evidence, remain our safeguard against impossible utopian demands for “safety.”

Thank you for your kind attention to these considerations.

**References**

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Theodore Rockwell, *Fear of Radiation is Killing People*. Chevy Chase, MD: MPR Associates, 1998. (PBNC '98 Conference, Banff, Canada)

What's Wrong With Being Cautious? *Nuclear News*, June 1997. pp. 28–32

**Remember when. . . ?**

Bob Cherry receiving his certificate designating him as a Certified Health Physicist from then-President David Cadena (1980-81?)

**THANK YOU, AND FAREWELL***Submitted by Sheryl Harley*

I write this note to thank each and every member of the STC-HPS for making my tenure with *The Billet* a wonderful one. As of July 13, 2000, I will be resigning my position with Southwest Research Institute after 10 years of service. I have accepted a new job with Valero Energy Corporation, and therefore will no longer be able to contribute my time to *The Billet*. I feel very saddened that I will not be able to assist the STC-HPS with the newsletter because each of you has been a pleasure to work with; however, I feel it is time for me to move on to new and difference challenges in my career.

Sincerely,  
Sheryl L. Harley

**South Texas Chapter  
HPS Members Take  
Galveston by Storm***Submitted by Chris Maxwell*

Members of the STC-HPS attended the 45th Annual Meeting of the Southwestern Chapter of the Society of Nuclear Medicine held in Galveston, Texas, March 31– April 2, 2000. Our goal for attending this meeting was to gain exposure for STC-HPS and hopefully sign up new members. Through a cooperative agreement between the two organizations, the STC-HPS was given a display booth to be used to promote our chapter. Ludlum Measurements provided a tabletop display that was transformed into an STC-HPS shrine. STC members attending and working the booth were Jim Sharp, Bruce Schoenbucher, Mary Van Baalen, Luz Cheng, Ruth McBurney, Cathy Clark, and Chris Maxwell. David Fogle provided a handout on “Top 10 Reasons to Join the STC,” and Bruce Schoenbucher provided an information/application handout that was very instrumental to our purpose. Special thanks to all who attended and worked on this project.

# Minutes of the Executive Council Meeting of the South Texas Chapter of Health Physics Society, Inc. Country Inn and Suites, Meeting Room Waco, Texas

May 5, 2000

## **Executive Council Members in Attendance**

David Fogle, President; Susan Jablonski, Treasurer; Ian Hamilton, President-Elect; Mike Charlton, Treasurer-Elect; Pete Myers, EC Member; Jim Lewis, EC Member; Chris Maxwell, Secretary

## **Chapter Members and Guests in Attendance**

Jim Sharp, Chair, Membership Committee; Linda Morris, Student Assistance Committee; Karen Myers, Chair, Public Relations Committee; Janet Hopkins, Nominations Committee; Eva Legler, Science Teacher Workshop Committee; John Hageman, Publications Committee; Cathy Clark

Quorum established at 5:25 p.m.

The meeting of the Executive Council (EC) of the South Texas Chapter of Health Physics Society, Inc. (STC) was called to order at 6:12 p.m. by President David Fogle. President Fogle's first order of business was to approve the previous EC meeting minutes. Treasurer-elect Mike Charlton made a motion to approve the minutes as distributed in *The Billet*. President-elect Ian Hamilton seconded the motion, and the motion was approved by unanimous vote. The next item of business was to finalize the agenda. EC member Pete Myers made a motion to accept the agenda. Treasurer Susan Jablonski seconded the motion, and the motion was approved by unanimous vote. President-elect Ian Hamilton made a motion to adjourn at 9:00 p.m. EC member Pete Myers seconded the motion, and the motion was approved by unanimous vote.

**President's Report** – President David Fogle began his report by updating the board on the STC website. President Fogle commented that the EC board members page and the upcoming meeting page were updated. President Fogle commented that he still needs bios and pictures from several board members. President-elect Hamilton noted that the STC website should include information on the Science Teacher Workshop program that our chapter is presenting at the National HPS meeting. President David Fogle reported that EC member Pete Myers had been awarded the "Moment of Truth" Award by the Texas Department of Health. This rarely presented award was given to Mr. Myers for his community service. Mr. Myers has helped with the Science Teacher Workshop by investing his time and money in support of the Science Teacher Workshop. President David Fogle will be sending thank you letters to the participants/ volunteers for their service at the STC workshops in Lubbock and Mercedes. President Fogle was notified by Jody Harrington and Genevieve Nixon with the Governor's Office of Appointments asking the STC to provide nominations for service on the Texas Radiation Advisory Board (TRAB) and the Texas Board of Licensed Medical Physics (LMP). The STC members nominated for TRAB were Mike Charlton, Roy Craft, John Hageman, Ian Hamilton, Chris Myers, and John Salsman. Nominations for the LMP board were Cathy Clark, John Haygood, Bill Johnson, Bob Lobaugh, Bruce Schoenbacher, Rebecca Middleton, and Joe

Nanus. President David Fogle was contacted by Ralph Heyer regarding an issue of Time magazine that contained false information. Mr. Heyer hoped that the chapter would provide a written or verbal response to this ad campaign. President-elect Ian Hamilton will work up a formal response from the STC. President Fogle reported on a thank you letter from National HPS President-elect Paul Rohwer regarding his visit to the Chapter. President Fogle had three requests for science teacher workshop material in response from our article published in the National HPS newsletter. President Fogle advised them that our chapter will be giving a presentation at the HPS meeting in Denver, and material will be given out. President-elect Ian Hamilton will handle a Conference for the Advancement of Science Teaching (CAST) letter regarding advertising. President Fogle asked all EC members to reply to President Johnson's request for comments with regard to the possibility of the HPS name change. President Fogle also noted that HPS is in the process of forming a committee to look into the possibility of a name change. President Fogle polled the EC members to see if we should pay for overnight freight charges for the science teacher workshop material. Treasurer Susan Jablonski made a motion to reimburse President Fogle for overnight freight charges up to \$60.00 for the science teacher workshop material. EC member Pete Myers seconded the motion, and the motion was approved by unanimous vote.

**Treasurer's Report** – Susan Jablonski, STC Treasurer, began by distributing copies of her report. Treasurer Jablonski also mentioned that she would be handing out the End of the Year Report at the business meeting. Treasurer Jablonski then gave details of the activities and balances of the operating and student scholarship funds. Treasurer Jablonski noted that the Certificate of Deposit (CD) is up for renewal. Treasurer Jablonski provided the EC with the status of the mutual fund and mentioned other options to consider before making the decision on the CD. Treasurer Susan Jablonski recommended reinvesting into a 25-month CD. EC member Pete Myers made a motion to reinvest the monies and proceeds into a 25-month CD. Secretary Chris Maxwell seconded the motion, and the motion was approved by unanimous vote. Treasurer Jablonski commented that President David Fogle donated \$200 to the science teacher workshop fund and \$300 to the scholarship fund. President Fogle's response was that the EC was gracious enough to give him a \$500 grant for his expenses to attend the HPS meeting in Philadelphia, and he did not want the Chapter to make this a habit. He felt that it would be more appropriate for him to donate it back to the science teacher workshop fund and scholarship fund. President Fogle congratulated Treasurer Jablonski for the incredible monetary advances that took place while serving as treasurer. President David Fogle commented that he would like to see the EC potentially transfer some of the operating fund into the science teacher workshop fund. Treasurer-elect Mike Charlton commented that he would like to see a committee set up some financial goals or financial plan for the STC.

President-elect Ian Hamilton commented that a written financial plan would be helpful in case of an audit. Treasurer-elect Charlton agreed to prepare the STC financial plan. President David Fogle called for a motion to accept the Treasurer's report. EC member Pete Myers made a motion to accept the Treasurer report. President-elect Ian Hamilton seconded the motion, and the motion was approved by unanimous vote.

**Secretary Report** – Chris Maxwell, Secretary, reported that the ballots for EC officers had been mailed to all South Texas Chapter members. More than 50 percent of the ballots were returned to the Secretary. The ballots were counted with six EC members in attendance. New officers are as follows: President-elect Susan Jablonski, Secretary Pete Myers, and Executive Council Member Chris Maxwell. Secretary Maxwell reported on various emails received. No correspondence was received.

**Committee on Admissions** – Chair Jim Sharp distributed copies of his report and stated that the Chapter has 217 members. Jim Sharp supplied a list of 17 applicants that were approved based on membership to the Health Physics Society, and 18 additional applicants to be voted on for membership. EC Member Ian Hamilton made a motion to accept 16 of the applicants and refer 2 to the Affiliate Committee for review. EC Member Jim Lewis seconded the motion, and the motion passed by unanimous vote. Treasurer Susan Jablonski asked that the Affiliate Committee look at the HPS affiliate member list for possible STC affiliates. A synopsis of policy statements similar to the one published in the HPS membership directory will be placed in the STC membership directory. Jim Sharp displayed several samples of lapel pins for review by the EC. A new STC logo with colors of gold and burgundy were decided on for the pin. President-elect Ian Hamilton made a motion to purchase 300 pins at \$2.35 each with an additional cost of \$95.00 for the set-up charge. Treasurer-elect Mike Charlton seconded the motion. Discussion: Treasurer-elect Mike Charlton commented that it would be nice to have the pins in hand at the HPS meeting in Denver. Jim reported that the turnaround time for the order would be 4 weeks, and reorders have a minimum of 150 each. Hearing no further discussion, President Fogle called for a vote. The motion passed by unanimous vote. President Fogle called for a motion regarding the selling price of the pin. EC member Jim Lewis made a motion to sell the pins for \$6 each. Mike Charlton seconded the motion. After discussion, the motion was amended and seconded to change the price of the pin to \$5 each. The motion passed by unanimous vote. Treasurer Mike Charlton made a motion to direct 100% of the funds to the science teacher workshop fund. EC member Jim Lewis seconded the motion, and the motion was approved by unanimous vote. President David Fogle entertained a motion to accept our new logo, to be used on STC correspondence, STC banner, and the pin. Treasurer Susan Jablonski made a motion to accept the new logo as the STC-HPS official logo. President-elect Ian Hamilton seconded the motion, and the motion was approved. President Fogle will continue to look into acquiring a new banner and report at the next meeting.

**Program Committee** – President-elect Ian Hamilton reported that he feels that tomorrow's meeting will be a very good meeting based on all the preparation by the speakers. President-elect Ian Hamilton reported that the next meeting will be in Galveston or at Kemah on August 12, 2000. President-elect Hamilton reported that the STC breakfast at the National HPS in Denver will be Tuesday, June 27, 2000. The breakfast meeting will begin at 7:00 a.m. with the meeting room to be determined. Treasurer-elect Mike Charlton

asked that a future meeting be geared for professionals. With regard to the student paper awards, President Fogle asked that the STC return to calling them Richard D. Neff Memorial Awards. President-elect Hamilton made a motion to give two \$100 awards. Secretary Chris Maxwell seconded the motion. The motion passed by unanimous vote. President-elect Ian Hamilton asked if the STC had ever given awards to the high school student level, and would the Chapter want to pursue.

**Public Relations Committee** – Karen Myers passed out a copy of her report, and stated that the recent publication of the National HPS Newsletter contained an article about the San Antonio meeting. The article about the longest-standing continuously active member featuring Ed Bailey will be in the next *Billet*. Karen also submitted a summary of the position statement from the HPS directory, for publication in the STC directory. President Ian Hamilton and Pete Myers will review the summary and forward it to National for approval. Other works in process include a science teacher workshop article for National. A technical/semitechnical article for *The Billet*, and an article on scholarship recipients and their after-graduation whereabouts are being developed.

**Nominations Committee** – Janet Hopkins reported that the committee had completed work on nominating members for the positions on the EC. President Fogle commented that Janet graciously stepped forward to chair the committee. President David Fogle commented that he had written letters in support of Susan Jablonski for the Elda E. Anderson Award and Bob Emery for the Robley D. Evans Medal. He also authored a letter for Jack Krohmer to be named as a Fellow Member of the Society. Janet Hopkins concluded her report by stating that the committee is looking for nominations for National HPS officers.

**Affiliate Membership Committee** – Chris Maxwell reported for Bill Huckabee that the STC now has 32 paid affiliates. Bill Huckabee is preparing to send out an attendees list for the paid affiliates from the Affiliate Fair/San Antonio meeting. Bill will also include information about the affiliates ads that are to be published in the STC directory.

**Legislative Report** – President David Fogle, reporting for Richard Ratliff, gave the EC recommendations on pending legislation. His recommendation was that the Chapter should make sure that if the legislation committee provides a report, then it should also provide suggested responses or directions for the EC. President David Fogle commented that in the past the STC received letters about changes in rules, draft rules being discussed, and comments being requested. This material would be sent to the Legislative Committee for official comment. In the future, Pete Myers will make sure that the letters are forwarded to the Committee. Treasurer Susan Jablonski commented that Ian Hamilton spoke on behalf of the STC at a recent Texas House of Representatives, Environmental Regulations Committee meeting on multiple waste and other radioactive material issues. Jablonski reported that in President-elect Hamilton's speech he reiterated what we (the Chapter) are here to help and that we have professionals to talk about any issues that they may need for resources. Treasurer Jablonski said she had a lot of positive feedback from his speech.

**Publications Committee** – John Hageman reported that the next *Billet* deadline will be June 16, 2000, and for the November issue September 15, 2000.

**Student Assistance Committee** – Linda Morris reported that the deadline for application for STC Student Grants is May 19, 2000.

Linda reported that only one had been received, but more are expected.

**Science Teacher Workshop Committee** – Eva Legler reported on the Science Teacher Workshop (STW) held in Mercedes, Texas. The STW had one of the best locations, and was a real success having 21 teachers. President Fogle commented that Eva has done a fabulous job. Fogle commented that Eva and Steve took a good program and made it great. Eva concluded that the material for the STW has been depleted. President Fogle reported that the next STW will be in College Station in September.

**Unfinished Business** – The STW at the HPS meeting in Denver – President-elect Ian Hamilton reported that we have three hours. Hamilton also reported that the HPS donated \$500 for beverages and snacks.

Secretary Chris Maxwell made a motion to change adjournment to 9:30 p.m. or earlier. President-elect Ian Hamilton seconded the motion, and the motion was approved by unanimous vote.

**STC LLRW Position Ad Hoc Committee** – Pete Myers reported that the original charge of the Committee, which was to develop a STC Position on LLRW Management that could be communicated to the Sunset Commission and the Senate Natural Resources Commission, had been overcome by events and the Committee was no longer necessary.

First, concern developed that the persons most familiar with LLRW management were employed by state agencies with mandates to regulate LLRW, and that issues of conflicts of interest might develop should they participate in authoring an STC Position on LLRW Management.

Second, disagreement developed on whether the HPS Position on LLRW adequately represented the STC Position. These factors, combined with (1) the Chairperson forgetting to undertake his appointed responsibilities, and (2) realization by the Chapter President that the deadline for submissions was impending, resulted in a decision being made by the Chapter President to write letters, basically providing information on who we were, that we had a diverse membership with extensive experience in radiation science, and offering our services in assisting any entity address issues that centered on low-level radioactive waste management.

Mr. Myers, indicating that he believed there was no longer any need for the Ad Hoc Committee, recommended that this item of unfinished business be closed. President Fogle discharged the committee.

**Southwest Chapter of the Society of Nuclear Medicine** – Chris Maxwell reported that several STC members attended the SWSNM meeting in Galveston. Our goal was to give our Chapter a little more exposure and sign up some new members. STC members attending and working the booth were Jim Sharp, Bruce Schoenbucher, Mary Van Baalen, Luz Cheng, Ruth McBurney, Cathy Clark, and Chris Maxwell. The handouts prepared by David Fogle and Bruce Schoenbucher were fantastic. Cathy Clark was very successful in signing up several new affiliates.

**2002 “Midyear Meeting”** – John Hageman stated that nothing has been said official. We will find out more after the National meeting.

**Houston Science & Engineering Fair** – President Fogle received a request for support. Eva Legler will contact the author of the letter regarding Chapter member involvement in the Fair and report at next meeting.

**Science Teacher of the Year Award** – President-elect Ian Hamilton stated that the winner will get \$500 from HPS plus travel expenses to the local chapter meeting of the HPS. Hamilton stated that Lori Harrison was nominated because of her attendance at the Lubbock workshop at CAST and her help to organize the Mercedes workshop. Ian Hamilton and Janet Hopkins will work together to get her nomination to National HPS.

**New Business** – Jim Lewis asked if future meeting dates could be placed on the website. Mike Charlton asked if anyone else would like to be the STC webmaster. Pete Myers said that David Fogle has been doing a wonderful job. The item was referred to Ian Hamilton for a potential Ad Hoc Committee to include Jim Lewis. President David Fogle presented Ian Hamilton with the STC’s official copy of Robert’s Rules of Order for his new term as STC President.

The meeting adjourned at 9:21 p.m.

Respectfully Submitted,

Chris Maxwell, STC Secretary

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## Myers

*From page 9.*

would be provided to the science teachers. He dedicated many evenings and countless hours to completely revising the materials (four binders worth of material!) to reflect current regulatory requirements, current radiation safety data, and relevant information pertaining to the use and disposal of radioactive material and x-ray devices in the State of Texas.

Mr. Myers, without hesitation, drove his own vehicle to and from Lubbock at his own expense, including an overnight stay, so that he could participate in the day long STW and provide for the education of the citizens (our primary customer) of the state of Texas. Even though TDH did not fund his efforts, Mr. Myers represented the Texas Department of Health with exceptional zeal, dedication and determination. Without Mr. Myers’ end-goal oriented, motivational leadership during the preparation and completion of the Lubbock STW, the Workshop would not have been conducted, and ultimately our customers (Texas citizens) would not have benefited.

With sincerest thanks, the South Texas Chapter prepared a letter of commendation, under the signature of its President, for Mr. Myers’ efforts and forwarded said letter to the Commissioner of Health.

Mr. Myers has exemplified himself and the Agency for which he works by unselfishly dedicating his time, his money and his talents to the citizens of the state of Texas. Mr. Myers should be commended for his efforts and accomplishments.

As Chapter members we should congratulate Pete, and all dedicated professionals who have invested their time and effort, made sacrifices and ultimately produced a very high quality program that has created a lasting legacy. Thanks to Pete’s diligence, and the diligence of others, the Chapter has resurrected the Science Teacher Workshop program and has been recognized by the national Health Physics Society as a leader in this community education activity.

# Control of Low-level Radiation Exposure: Time for a Change?

Roger Clarke

Chairman, International Commission on Radiological Protection  
Director, National Radiological Protection Board, Chilton, Didcot, Oxon OX11 0RG, UK

Submitted by Ian Scott Hamilton, Ph.D., CHP

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**Abstract.** The carcinogenic risks of exposure to low-level ionizing radiation used by the ICRP have been challenged as being, at the same time, both too high and too low. This paper explains that the epidemiological evidence will always be limited at low doses, so that understanding the cellular mechanisms of carcinogenesis is increasingly important to assess the biological risks. An analysis is then given of the reasons why the challenges to the ICRP, especially about the linear non-threshold response model, have arisen. As a result of considering the issues, the Main Commission of the ICRP is now proposing a revised, simpler, approach based on the concept of what is being called ‘controllable dose.’ This is an individual-based philosophy and represents a shift in emphasis by the Commission from societal-oriented criteria using Collective Dose. Finally the paper speculates on the consequences for radiological protection of such a change in policy. The Commission wishes its ideas to be discussed as part of its reconsideration of its recommendations.

## 1. Introduction

It is now ten years since the ICRP promulgated a draft version of what was to become the 1990 recommendations. That consultation process helped the Commission to clarify its aims and the expression of its philosophy. Since the issue of Publication 60 [1], the Commission has further elaborated its policy on a number of issues such as control of exposure to radon-222, criteria for intervention after an accident, the management of occupational exposure, and its policy for the disposal of radioactive wastes.

However, in recent years questions have been raised about the Commission’s application of its risk factors at low doses. This article discusses the current ICRP position and attempts to analyze why the questions have arisen. Some proposals are then made for a different, less complex, approach to protection. The Commission is considering a consolidation or recapitulation of its 1990 recommendations and wishes the ideas in this paper to be widely discussed as part of the process leading to a restatement of its protection policy.

## 2. Carcinogenic risks of low-level radiation exposure

### 2.1. Epidemiological evidence

Some of the most critical judgments in radiological protection have been associated with estimating the risk of excess cancer following low-dose irradiation of human populations [1–4]. The most difficult problem surrounding these judgments is that epidemiological approaches such as those used with the Japanese A-bomb survivors have only the power to identify excess risk down to low-LET radiation doses of around 50–100 mGy [5]. However, some analyses of the Japanese survivor data are claimed to show no excess below 200–300 mGy, and certainly some other cohorts appear to demonstrate risks only at higher doses than the data from the Japanese studies.

Below doses of a few hundred mGy, statistical power is progressively lost, and direct estimates of cancer risk in a population of all ages becomes increasingly difficult and then impossible. Lower background cancer rates in children allow for estimation of *in utero* radiation risks down to about 10 mGy [3, 6], although these analyses are being challenged. But the problems of estimating the risk at occupational and environmental exposure levels of radiation remain. Experimental limitations create essentially the same statistical problem in studies of animal carcinogenesis. However, in the last 10 years or so advances in biology, often based upon molecular genetics, have increasingly complemented the conclusions from epidemiology [2, 4].

### 2.2. Mechanisms of carcinogenesis

There is compelling evidence that cellular DNA present in the chromosomes of the cell nucleus acts as the principal target for spontaneously arising and carcinogen-induced tumors in humans and experimental animals [3, 4]. The DNA damage relevant to initial tumor development takes the form of gene and chromosome mutations that often appear to be specific to different tumor types.

There is abundant evidence that the capacity of irradiated cells to repair DNA damage acts to reduce mutational and tumorigenic risk. An argument used by some is that the low abundance of DNA damage at low doses allows complete and error-free cellular repair. According to these proposals it is only at high doses where repair capacity is saturated that tumorigenic risk becomes apparent. The proponents of this hypothesis support their argument with data showing that the abundance of spontaneously arising DNA damage arising in cells is very much greater than that induced by a low dose

**Controllable Dose***From page 14.*

of ionizing radiation, say 200 mGy—how can there be excess cancer risk at these low doses?

A large body of data reveals the critical flaw in this argument [4]. These data show clearly that spontaneously arising DNA damage is chemically simple, principally in single DNA strands and is readily repaired by the cell with a very low frequency of error, so that mutation rates are low. In contrast DNA damage produced by ionization clusters within single radiation tracks is usually not chemically simple and can take the form of complex breaks in both strands of the DNA molecule. This complex damage is very difficult to repair correctly and as a consequence mutation rates are very much higher than that associated with spontaneous DNA damage. In accordance with these observations, dose-response relationships for gene and chromosomal mutations have been shown to be approximately linear down to doses of around 25 mGy, which is the statistical limit of their power. At present, the evidence available supports the view that ionizing radiation acts most strongly as the early initiating phase of tumor development by inducing specific gene loss in stem cells [7].

Stated simply, although there are good reasons to believe that DNA damage repair in cells does act to substantially reduce the risk of radiation tumorigenesis, current knowledge does not support the concept that at low doses these repair functions can abolish such risk. Associated arguments for a dose threshold dependent upon the postulate that low-dose irradiation induces additional DNA repair capacity lack adequate supporting data and also fail to take account of the complex DNA damage problem noted above [8].

In the absence of directly informative quantitative data on radiation tumorigenesis, the shape of the low-dose response has to be judged on indirect data on the cellular mechanisms involved in the whole of this complex process.

In essence, this judgment has and will continue to be made on the basis of ‘weight of evidence’ since there are no prospects that the existence of a low-dose threshold for tumor induction could be proved or disproved conclusively. In respect of current knowledge it has been argued here that the evidence weighs against the concept of a low-dose threshold and favors the existing judgment that tumor risk will rise as a simple function of dose even at very low doses and dose rates. That is not to say that dose thresholds for tumor induction are not biologically feasible. Indeed data from experimental animals for certain tumor types and radiation quality do provide some evidence of this; one possible explanation of these data is that in some situations it is necessary to produce a degree of normal tissue damage before tumor development will proceed.

It is important to stress; however, that radiological protection systems need to be as simple as possible and to focus on the general consistency of all relevant data, not just the inevitable biological intricacies and exceptions.

The same general considerations apply to a controversy of more recent origin than that of threshold doses, namely the cellular phenomenon of radiation-induced persistent genomic instability [9]. It has been claimed by some [10] that the finding of this phenomenon poses a challenge to accepted concepts in radiological protection, and that risks may be higher than currently judged. The phenomenon has yet to be associated with tumor risk or other possible health effects [11]. Also, even if it were to be established, there would be no obvious implications for the direct epidemiological-based central estimates of cancer risk on which risk projections are founded. Nev-

ertheless, the development of this new area of speculation on possible underestimation of low-dose risk provides an interesting counterpoint to the longer-standing debate on dose thresholds and the entirely opposite claims of its proponents.

In conclusion, ICRP judges that the weight of evidence at present falls in favor of assuming that those radiation events are potentially disruptive from the lowest doses. And while apoptosis, cellular surveillance, and immune and adaptive responses are all real, they are most likely to modify the shape of the dose-response curve rather than proving a threshold [2, 4].

The major policy implication of a non-threshold relationship for stochastic effects is that some finite risk must be accepted at any level of protection. Zero risk is not an option, and this leads to the three principles that comprise the current policy of the Commission:

- Justification: do more good than harm.
- Optimization: maximize the margin of good over harm.
- Limitation: Individual risk should not be unacceptable.

**3. What is the problem?**

It is useful to ask why it is that challenges to the so-called linear non-threshold hypothesis have arisen.

Contaminated land is an issue of considerable interest in many countries. It arises as a result of accidental releases, as from Chernobyl, and from man-made activities including atmospheric testing of nuclear weapons. Contamination is also an historic liability from, for example, luminizing plants using radium, or from excessive effluent discharges.

A particular issue at present is the decommissioning of nuclear facilities, old reactors and weapons fabrication facilities. These liabilities require the expenditure of considerable amounts of money and some people think that too much money is being, and will be, spent to achieve low levels of residual contamination. If contaminated land is not cleaned up, there is public concern and in some countries there will be litigation, charging that the environmental risk is too great. These concerns have led to an increased pressure from some individuals to propose a threshold in the dose-response relationship in order to reduce the expenditure. The issue is primarily in relation to public, not occupational, exposure.

Another aspect of concern is the use of Collective Dose to add up infinitesimally small doses to essentially infinite populations over essentially geological timescales and to cost it so that it is argued that it is worth committing huge resources today to protect the future. ICRP has already begun to tackle this by recommending, in Publication 77, the disaggregation of the single value of a collective dose into ranges of individual dose and the period of time when it is delivered. Further it cautions against the use of estimates of doses and health effects in the far future [12].

**4. Difficulties with a threshold**

A simple proportional relationship has important practical implications since it allows doses within an organ or tissue to be averaged over that organ or tissue, doses received at different times

**Controllable Dose**

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to be added, and doses from one source to be considered independently of the doses from other sources.

These practical implications are of overwhelming importance in radiological protection because of the complexity of the dose distributions in both space and time and because of the ubiquitous presence of natural sources of radiation. Very substantial difficulties would be introduced if threshold relationships were widely relevant in radiological protection. Threshold relationships exist for deterministic effects, but the levels of dose of concern in protection are generally well below these thresholds. When this is not so, as in radiotherapy, a single source of dose is predominant so that interaction between different sources can be neglected. One example of the complexities that would be introduced by a widely applicable threshold relationship would be the interaction between occupational exposure and nonoccupational exposure to natural sources, and diagnostic medical exposure of individual workers. In order to control the risk, it would be necessary to record all doses people received and with a threshold, protection by design is almost impossible. It is true that, increasingly, science is judged in the courts rather than by national academies of science. Judge and jury are increasingly likely to decide the issue, and it is they who must be convinced as to whether there is a threshold and thus no risks at low doses of radiation.

As has been said above, there is uncertainty in risk estimates due to both biology and epidemiology, although it must be remembered that the exposures are always increments on the existing natural background radiation of a few mSv per year. Because of the continuing lack of definitive scientific evidence, a new approach to protection could be considered.

**5. Confusion**

ICRP has made clear that the present system of protection distinguishes between practices, which add doses and risks, and interventions, which reduce doses and risks [1, 12]. The dose limits apply to the sum of doses from a restricted set of sources or circumstances and, additionally, are often misunderstood since a limit is sometimes taken to mean the boundary between safe and unsafe. For public exposure in particular, there is confusion about the application of the 1 mSv annual dose limit when the Action Level for radon in homes is to be set between 3 and 10 mSv in a year. Then, in the event of an accident, perhaps when people especially expect to be protected, the dose limit does not apply and intervention is not taken until doses are liable to be in the range of 5 to 50 mSv.

ICRP recommendations, in the context of the use of radionuclides, have been for the control of protection from single sources by optimization within the individual maximum dose constraint of 0.3 mSv per year [12]. In the case of accidents, intervention levels have been suggested for taking action to reduce exposures, but there is no international guidance on the withdrawal of intervention actions. At what level of dose can normal living be resumed? More than 1 mSv per year surely, and if a new population moves from outside into the area, is it a practice to which the 1 mSv dose limit applies? Thus, at what point after an accident do the principles of protection for practices apply, if at all? Along these lines, is building a house in an area of high natural background radiation to which people might move from areas of lower background, a practice to

which the 1 mSv limit is applied? Strict application of the definition of a practice given in ICRP Publication 60 might suggest that this is so.

These are situations that do not easily fall into the current definitions of practice or intervention; radiological protection philosophy might usefully be re-examined in order to develop an alternative, logically consistent framework for protection to that used at present. The following thoughts are for discussion and are a first attempt to do this by bringing the three categories of exposure, occupational, medical, and public, within an overall framework that encompasses the present system of protection for practices and interventions. These represent a scheme that may be complementary to, rather than a fundamental change in, the Commission's system of protection and may be of use in its application.

The difficulties outlined and the uncertainties in estimating risks from low-level radiation exposure have led ICRP to consider whether there might be some alternative way to deal with the control of dose. In formulating the proposals, an attempt has been made to try to simplify the system of protection.

**6. A possible way forward**

In protecting individuals from the harmful effects of ionizing radiation, it is the control of radiation doses that is important, no matter what the source. Thus, a start may be made with a definition:

*A Controllable Dose* is the dose, or the sum of the doses, to an individual from a particular source that can reasonably be controlled by whatever means.

Such doses could be received at work, in medical practice, and in the environment from the use of artificial sources of radionuclides, or could arise from elevated levels of natural radiation and radionuclides, including radon. The term covers doses that are being received, for example from radon, and doses that are to be received in the future, for example from the introduction of new sources or following an actual or potential accident. It does not apply to exposures that are not amenable to control, such as cosmic radiation at ground level, but would apply to high terrestrial levels of natural exposure.

In the past, ICRP has emphasized societal criteria, using collective dose summed over all populations and all times, principally in cost-benefit analysis, to determine the optimum spending on the control of a source. What is now being developed is a more individual-based philosophy, which was foreshadowed by the introduction of the concept of a constraint on the optimization of a source and the Commission's recommendations on disaggregation regarding Collective Dose [12].

**7. The principle**

The protection philosophy for controllable dose is based on the individual. If the individual is sufficiently protected from a single source, then that is a sufficient criterion for the control of the source. The principle is

If the risk of harm to the health of the most exposed individual is trivial, then the total risk is trivial—irrespective of how many people are exposed.

**Controllable Dose**

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The significance of a level of controllable dose depends on its magnitude, the benefit to that individual, and the ease of reducing or preventing the dose. There will, of course, be some level of dose where control will be mandatory. This will clearly be for the avoidance of deterministic effects in accident situations or for the protection of healthy tissues in high-dose medical procedures.

Doses of some hundreds of millisieverts up to several sieverts will cause deterministic effects of various types depending upon whether the exposure is acute or chronic. Apart from in radiotherapy, such doses may be encountered in interventional radiology, where there is a life-threatening situation. In other circumstances, such exposures will be entirely unacceptable to the individual, unless taken for life-saving rescue in an emergency. These situations are considered to be outside the scope of the proposed scheme of controllable doses set out here.

**8. Controllable dose**

For those exposures that are to be controlled, the philosophy is essentially set out here with a regime of controllable doses showing their different significance in terms of individual fatal cancer risk. In addition, the current criteria for controlling doses in normal, accident, or medical situations are presented.

Thus, the highest dose that will normally be tolerated before control is definitely instituted is in the range of a few tens of millisieverts although this may be tolerated in successive years. This covers, *inter alia*:

- Recommendation of the permanent relocation of people following an accident to avert a lifetime dose of 1 Sv, which corresponds to some tens of mSv in the first year.
- The occupational dose limit of 20 mSv in a year.
- The upper (justified) action level for radon in homes (10 mSv per year).
- A CT scan (around 30–50 mSv).
- The lower level of averted dose above which evacuation is recommended after an accident (50 mSv).

The level of individual risk represented by some tens of mSv would be of the order of 1 in 1000 or  $10^{-3}$ . While these levels of dose to the individual are not so high as to be completely unacceptable, they are levels at which questions should be asked as to whether the dose and associated fatal risk can be avoided by some sort of action. That action may be disruptive by intervening in lifestyle, or, as in the case of a CT scan, be simply to be sure that the required information cannot be obtained by another means, for example, magnetic resonance imaging.

Controllable doses should not generally exceed this level, and actual or potential doses approaching this level would only be allowed if the individual receives a benefit or the doses cannot be reduced or prevented without significant disruption to lifestyle.

At levels of controllable dose of the order of a few millisieverts, the exposures should not be of great concern from the point of view of an individual's health. Natural background radiation is about 2–3 mSv in a year, and even if radon exposures are excluded, the figure is 1–2 mSv. Typical exposures in the range would be:

- The lower level of optimised range for radon intervention (3 mSv).
- The lower level for simple countermeasures (sheltering, KI) in an accident (5 mSv).
- The existing dose limit for members of the public (1 mSv).
- Simple diagnostic x-ray examinations (few mSv).

Steps may be taken to reduce these exposures, or to prevent them, particularly if the individual receives no benefit. Thus from a controllable dose of a few millisieverts upwards it becomes increasingly desirable to reduce or prevent the dose depending both on the practicability of doing so and whether the individual is deriving any tangible benefit from the exposure, for example annual occupational exposures or unnecessary doses from medical examinations. The associated levels of fatal risk would be  $10^{-4}$ , 1 in 10,000.

In essence, this is a dose at which there is a question mark. If the medical examination is going to give a dose of a few mSv, again the question of whether an alternative procedure can give the required information should be asked, even though it can be argued that there is benefit to the patient. Similarly if a worker were receiving more than a few mSv, management would probably wish to ensure that the doses were as low as compatible with the job being undertaken. For the public, again, action would be contemplated.

Doses that are below the millisievert level are also relevant in the control of exposures. In connection with uses of radiation sources, the Commission has set the maximum dose from a single source to a member of the public at 0.3 mSv a year [12]. The associated level of fatal cancer risk is about  $10^{-5}$  per year. This level of dose is about 10% of total natural background dose and is also of the same order as to variation in background radiation (excluding the radon contribution) over much of the world. This level of imposed or involuntary risk is about the most that has been judged as being tolerated by members of the public.

In comparison, a level of risk of death of  $10^{-6}$  per year is commonly regarded as trivial, and the corresponding annual dose of about 10–20  $\mu$ Sv has been used to set exemption criteria for the Inter-Agency or European Basic Safety Standards [13, 14]. At this level of dose there should be no need to consider protection of the individual.

The dose levels discussed above are set out in figure 1 together with the doses that arise from the application of the present system of protection in a wide range of situations. There is, quite deliberately, no distinction between single doses and those that may be received repeatedly. This may be simpler for people to understand. Also, it is controversial to include medical exposures, but perhaps it may help to give the public a broader perspective on doses and risks if all the situations that lead to a given numerical value are put onto a single scale.

**9. A practical solution**

A suggested way forward may be to work toward a single maximum level of controllable dose. The value would be around 20–30 mSv in a year. Doses significantly above this level would only occur in uncontrolled accident situations or in life-saving medical procedures. It may be that rather than referring to this value as a

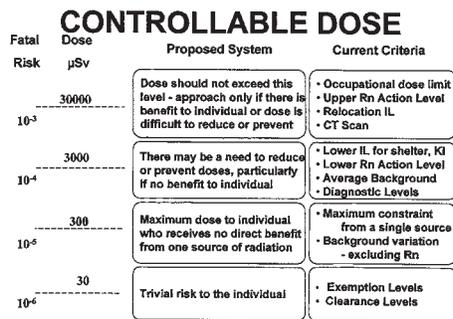


Figure 1.

limit, the term ‘action level’ should be used. In fact, that is what it would be—if controllable doses (actual or projected) are above this level, action should be taken. This may have an advantage that Action Levels are understood, whereas a ‘limit,’ as has been said, can be and often is misunderstood.

The management of controllable doses below the Action Level would be by individual-related source-specific Investigation Levels. They would apply to different actions taken to reduce exposures at the source, in the environment or by moving people. They would cover, for example, occupational exposures, simple medical procedure doses, exposures from domestic radon or from other elevated levels of natural radionuclides, and those after an accident. The need for distinguishing between practices and interventions may no longer be required. This Investigation Level of around a few millisieverts per year would prompt an investigation to see if anything simple could be done to reduce the exposure.

Within this scheme, exposures of a fraction of a millisievert would be the most that would ever be allowed to a member of the public from a single source, irrespective of the number of sources—effluents from a hospital, from a power plant, a diagnostic x-ray, a smoke detector, etc. These sources would be treated independently because the chance of one individual being exposed to all sources is very small, and actual exposures from several sources would be unlikely to amount to more than a fraction of a millisievert. The term ‘Constraint’ could still be retained, and the principle of optimization applies for each source.

At the lowest level, doses of a few tens of microsieverts would be considered to be so low as to be beneath regulatory concern. There would be no need to involve any system of protection below these levels.

## 10. The consequences

The proposals presented here put the primary emphasis for the system of protection on the individual, by adequately restricting the sources that may reasonably be controlled. The Commission’s principles of justification and optimization would next need to be reconsidered. Since radiological protection essentially plays such a minor part in a government’s decision to justify the introduction, or the continuation, of a given use of radiation, consideration should be given to dropping the principle of justification from the ICRP system.

The existing principle of optimization would be recast and clear guidance would need to be developed on its application. This would require the replacement of ‘as low as reasonably achievable,’ which has been associated with cost–benefit analysis and the use of Collective Dose, with another descriptor when individual dose is the determining criterion. It may be that the number of people affected by the highest levels of dose would be a determinant in deciding what is practicable.

The principles of protection might then become:

- Control the dose to the representative member of the most highly exposed group.
- Ensure that the resulting dose is ‘as low as reasonably practicable.’ These may be known as ‘Control’ and ‘ALARP.’

There would be considerable scope for a simplification of the system of protection and remove confusion by not distinguishing between practices and interventions.

It is probably no longer sufficient for ICRP to state its belief that ‘the standard of environmental control needed to protect man to the degree currently thought desirable will ensure that other species are not put at risk.’ An advantage of the controllable dose system is that it may facilitate the development of an environmental protection strategy for radiation protection that is more compatible with those for other environmental agents.

Additionally, it may be that there is no longer a need to differentiate between occupational, public, and medical exposures. The same guidance is equally applicable for protection of each category. Any particular concerns about the protection of the unborn child would also be covered by the constraint of a fraction of a millisievert and investigation level of a few millisieverts.

There would be no need for the existing 1-mSv dose limit for the public.

Finally, there would be no use made of Collective Dose as currently defined since the proposed policy of protection ensures that if the most exposed representative individual is sufficiently protected from a given source, then everyone else is also sufficiently protected from that source.

If at some time in the future it became possible that some individuals might be liable to receive, in due course and over a prolonged period of time, a significant accumulation of doses from many sources, local, regional, and global, then a further restriction on sources may be necessary. There would, however, be likely to be a considerable time period available to effect change.

This more straightforward single-scale system of protection is consistent with the present system based on acceptable risks, but importantly may be explained to individuals more understandably as multiples or fractions of the natural background. In which case, perhaps there is no need to destroy the credibility of the profession in arguments for or against a threshold.

ICRP would welcome a wide discussion on the concepts of controllable dose and the new proposals for a simplification of protection philosophy that could lead to a restatement of its recommendations.

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**Note:**

As may be understood from reading the above, the various national and international bodies that make radiation protection recommendations are considering some far-reaching changes in the way HPS might perform their day-to-day duties. I urge each one of you to read up on all the various concerns surrounding these matters. In addition, feel free to contact the HPS via their website if you have a strong opinion, one way or the other, and are a member of that society. If you're not already a member, sign up, and then make your comments. ISH

**JOB OPPORTUNITY***Submitted by John Hageman*

Southwest Research Institute, Center for Nuclear Waste Regulatory Analyses, Human Resources Dept. #00168, PO Drawer 28510, San Antonio, TX 78228, email: or visit us at: [www.swri.org](http://www.swri.org)

Southwest Research Institute, a nonprofit applied research and development organization based in San Antonio, Texas, has an immediate opening for a Research Engineer with expertise in risk analysis and experience in pathway dose modeling.

This Engineer will perform and review risk analyses, including probabilistic risk assessments of engineered safety systems for hazardous and nuclear facilities; human health risk assessments for exposure to chemically toxic and radioactive materials; ecological risk assessments of contaminated surface and subsurface waters; and innovative research in the probabilistic risk assessment and pathway dose modeling areas. Requires an MS or PhD in Risk Assessment, Reliability Engineering, Nuclear Engineering, Health Physics, or a related field; 3–10 years experience desired. Must have experience conducting reliability and systems analysis using fault and event tree methods; pathway dose analysis using codes such as GENII and RESRAD a plus.

Knowledge of regulations applicable to storage, transportation, and disposal of high-level wastes, uranium mill tailings, and decommissioning of radioactively contaminated sites; design and assessment of hazardous chemical operations highly desirable; able to work on a diverse, multidisciplinary team; excellent written and verbal communication skills; expertise in probabilistic risk assessment and pathway dose analysis; experience developing and applying mathematical models of radionuclide and chemical contaminant transport, uptake, and concomitant dose; experience using a high-level computer programming language such as FORTRAN 90, C, C++, Mathematica, or MATLAB. All applicants must pass a conflict of interest evaluation and be qualified for an NRC security clearance.

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# The World Will Require One New 1,000-MWe Nuclear Power Plant to Come On-line Each Week By the Year 2050!

Ian Scott Hamilton, Ph.D., CHP

Alan Waltar, Professor and Head of the Texas A&M University Department of Nuclear Engineering, shared this and many other facts with almost 70 members of the South Texas Chapter as they met for the 2000 annual meeting in Waco on May 6th. The meeting was held at the Ideas Center on the campus of Texas State Technical College (TSTC), which is home to the premiere Radiation Protection Technology program in the state. Waltar, who is also a past president of the American Nuclear Society, and author of *America the Powerless*, was the keynote speaker during a meeting that featured the past, present, and future of educating students in our discipline as the theme.

Dr. Waltar provided a look to the future when he presented "Nuclear Technology: Prospects for Our Glowing Future." He addressed such concerns as:

- Global energy needs
- The ever-increasing world population and a comparison of the quality of life between first- and third-world countries, based on per-capita energy consumption
- Projections by the World Energy Council on how the citizens of planet earth will meet the growing energy demand

According to Dr. Waltar (and the World Energy Council), we will need to bring one new 1,000-MWe nuclear power plant on-line per week, by 2050, if at that time people in third-world countries realize a standard of living that is one-third of the current US per capita energy consumption. This takes into account an assumption that we will maximize the use of hydro, solar, and biomass energy production, and that world usage of fossil fuel-derived energy sources will far exceed a level deemed necessary to meet emissions criteria of the Kyoto Accord (Kyoto Protocol To The United Nations Framework Convention On Climate Change, December 1997).

As an aside to Dr. Waltar's commentary, a recent MSNBC reader poll ([http://www.msnbc.com/modules/surveys/032699\\_nuclearLong.asp](http://www.msnbc.com/modules/surveys/032699_nuclearLong.asp)), initiated on the twentieth anniversary of the accident at Three Mile Island (TMI), shows that four out of five of the 21,543 respondents think nuclear energy is safe, more than four out of five think that new plants should be licensed, three-fourths would live with such a facility in their community, and two-thirds would be willing to pay more for an energy-efficient society. In addition, almost three in every four respondents felt that the industry had learned a satisfactory lesson from TMI, and that government regulators effectively monitor the nuclear industry. These opinions correlate strongly with those reported in a recent study by the Nuclear Energy Institute (NEI 2000). Two-thirds of 500 college graduates who are registered to vote, and 1,000 members of the general adult public, favor nuclear energy—this number has remained steady for the past three years. About the same percentage feel confident that US utilities have the ability to safely operate a nuclear power plant and around forty percent recognize that the nuclear option holds some environmental benefits.

John Poston provided a look to the past with a forty-five-minute retrospective entitled "History of Health Physics: the Golden Age." John started out with pioneers such as Roentgen and Becquerel, and the Curies, and moved on to such greats as Lauriston Taylor and

seven other physicists who took up the yoke of radiation safety during the Manhattan Project. He discussed these and other personalities pivotal to the history of health physics. John also outlined a chronology of the seminal events in the history of the profession. He closed by reminding people that we were not in the sunset of the profession, but rather that we should look at the present and to the future; that the people in the room (and those reading this) were the "movers and shakers" in the field of health physics who would write the next chapter of the history of this proud and relevant profession.

Dr. Mitty Plummer, Professor and Coordinator of the University of North Texas Nuclear Engineering Technology degree program, spoke to the present, as he described a new program within his department, a Radiological Health Engineering Technology program. Mitty described the scope of the new program, hurdles to still overcome, and advanced credit for people who had graduated from two-year programs such as the Radiation Protection Technologies Program (RPT) at TSTC.

Sabra Pope, herself a graduate of the TSTC program, and now a health physicist with the Nuclear Regulatory Commission, spoke about the present, as well. Sabra directed her talk to the students in the audience, those who would soon graduate and go on to fruitful jobs or who would seek out further educational opportunities. She encouraged them to formulate a plan and to stick to it no matter what—good advice in a day and age where we see dwindling educational opportunities for prospective students.

We deliberately chose TSTC as the venue for this year's annual meeting. Texas State Technical College's Radiation Protection Technologies Program has been in abeyance for some time now. At a recent meeting of the Advisory Committee for the Environmental Health and Safety Technology Program (of which RPT is a part), it was announced that the College would begin the sunset process for the RPT program this fall unless student enrollment increased. Not wanting to see this happen, President-elect Hamilton wrote letters of invitation to the President of TSTC Dr. Martha Ellis and the Dean of Instruction Mr. Elton Stuckly requesting their attendance at our meeting to see first hand the faces behind the Health Physics Society and realize the benefits of continuing the RPT program. David Day, Chair of the Environmental Health and Safety Technology Program, attended in their stead. Mr. Day, along with several other members of the TSTC faculty, administration, and staff, took in the aforementioned presentations, listened to anecdotal evidence for the continued need of his RPT program throughout the Southwest, and presentations made by student chapter members concerning their research.

Seven students presented their work. Michael Charlton, now with the University of Texas Health Science Center San Antonio, and our current Chapter Secretary, presented Ph.D. work he had performed in a joint study between Texas A&M (TAMU) and the University of Texas Houston-Health Science Center (UTH-HSC). Mike Hernandez, Amy Orders, and Janet McCrary also presented work on behalf of UTH-HSC. Likewise, Donald Halter, Nasir Bhuiyan, and Mark Nelson presented student work on behalf of TAMU. Robert

Berry (TAMU) presented a professional-level lecture on the status of WIPP.

Chapter President David Fogle followed the student presentations with a State of the Chapter address. David expended eighty person-hours going through STC records as far back as they had been recorded (early seventies). He presented an outstanding address that encompassed the theme for our meeting by recounting the Chapter's past (some very humorous stuff), our status, and plans for the immediate future.

President Fogle followed his Address with a short business meeting, which included a financial report. One highlight was the awarding of two R.D. Neff Memorial Awards, each \$100, for the two best student papers—congratulations to Amy Orders and Mark Nelson! Another highlight was the installation of new officers.

David Fogle became the immediate past-president, Ian Hamilton became president, and Susan Jablonski was installed as president-elect. Mike Charlton replaced Susan as the new treasurer, Pete Myers replaced Chris Maxwell as the new secretary, and Chris was installed as our latest elected board member—congratulations to all! Finally, a thank you goes out to the 100+ members who voted in this year's election. The South Texas Chapter remains the finest chapter in the US because of such interest and participation by its membership.

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## Governor's Office Appoints STC Nominee to TRAB

*David Fogle & Ian Hamilton*

On June 20, 2000, in culmination of the nomination process, a representative of the Governor's Office of Appointments (GOA) telephoned the Bureau of Radiation Control to inform the agency of the appointment of new members to the Texas Radiation Advisory Committee (TRAB). Elaine Wells, public representative from Tyler; Kevin Robbe, uranium industry representative; Gene Coleman, agriculture representative from Lubbock; Judith Pester, M.D., pathology from El Paso; and South Texas Chapter of Health Physics Society, Inc. (STC) President Ian Hamilton, CHP from Texas A&M University.

On March 14, 2000, then STC President David Fogle received a telephone call from Mr. Jodey Arrington of the GOA. During the course of the conversation it was revealed that the GOA was soliciting candidates for vacancies on the TRAB from the STC and that the nominations had to be into the GOA as soon as possible—within three days if possible! Mr. Arrington continued by saying that the nominees are to fill the health physicist position on TRAB and should be certified in health physics. Mr. Fogle thanked Mr. Arrington for requesting this information from the STC and hurriedly contacted the STC Executive Council for nominations. On March 16, 2000, Past-President Fogle faxed a letter of nomination for six candidates from the Chapter to the GOA.

After receiving all nominations, the GOA requested each candidate forward a completed application for appointment and a

vita/resume. The GOA expressed that they were interested in (1) filling the vacant positions, and (2) filling those positions with representatives from geographical regions that they did not already have on the board. If the application/resume made it through the "culling-out process" the GOA called each candidate for an interview. Personal references were very important during this part of the process, as they are an indication of professional service and the quality of candidate experience. The interview was conducted in an open dialogue fashion where the candidate got to ask questions and give impressions just as the interviewers did. President Hamilton said, "I emphasized the need to work with the entire radiation protection community, and to get word of the Board's activities out to the public on a regular basis." After making that cut, and having your application/resume/interview responses reviewed by the Governor personally, finalists are then interviewed by their respective Senator. A favorable Senatorial interview results in an endorsement for confirmation by the Texas Congress. Mr. Hamilton was interviewed by Senator Steve Ogden. Hamilton wrote, "I feel very fortunate about this since he [Ogden] is a former nuclear submarine engineer officer (the highest-ranking engineer aboard). He is very knowledgeable about 'things radiation' and I enjoyed our talk." Once confirmed, the nominee/candidate becomes appointed.

To learn more about the TRAB, point your browser to: <http://www.tdh.state.tx.us/ech/rad/pages/page12.htm>.

# South Texas Chapter – Health Physics Society Chapter Dues Payment/Membership Application Form

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Yes, I am a National HPS member.

Yes, I am a Certified Health Physicist.

Yes, I am a Registered Radiation Protection Technologist.

Please check the STC-HPS committee(s) on which you would like to actively serve.

Nominating       Meeting Program       Membership       Publications

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Enclosed is my check # \_\_\_\_\_ made payable to the STC-HPS for the following:

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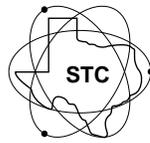
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Membership Committee  
P.O. Box 910  
Alvin, TX 77512-0910

Phone: 281-316-0052  
Fax: 281-316-1028  
Email: jsharp713@aol.com



HEALTH PHYSICS SOCIETY  
South Texas Chapter  
P.O. Drawer 28510  
San Antonio, TX 78228-0510  
ATTN: John Hageman



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