

# NRRPT® NEWS

## National Registry of Radiation Protection Technologists

Summer 2009 Edition

Incorporated April 12, 1976

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### Chairman's Message



Dave Biela

This has been a very busy quarter. First I want to congratulate all the individuals that passed the August exam. I know all the hard work you had to put into preparing for it. Since I was first elected as the Chairman of the **NRRPT** almost two years ago, I have been asking that all of you in the registry take non-registered technicians under your wing to try to help them prepare to sit for

the **NRRPT** exam. I have a really good story about how the registry helped an individual years ago and how that individual is helping all of you. I hope that this story encourages all of you to help out other technicians. You never know where it may lead:

Last month I had the opportunity to meet Lorenzo Cabrera, owner of Cabrera Services. As we talked, he told me a little bit about his past that I found very interesting. Lorenzo began his nuclear career the way a lot of you did. He worked in the laundry during outages. He worked his way up as a Jr. technician and then a Sr. technician. Once he had enough time as a technician he sat for and passed the **NRRPT** exam. Shortly afterwards he began his college career and to help with the cost he applied for and received a scholarship from the **NRRPT**. As school was finishing, Lorenzo, along with several of his friends, got together and started Cabrera Services. Now the "pay it forward". As we were talking, Lorenzo not only became a silver sponsor for the **NRRPT** he also donated \$10,000.00/year for the next five years. He did not want any recognition for this, but he

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did ask for the money to be used strictly for scholarships. He wants to help others like he was helped. Thank you Lorenzo! If you believe you would be a candidate for the scholarship program, please download the application from the **NRRPT** website and submit it to the Executive Secretary's office.

In July we completed our 72<sup>nd</sup> Board of Directors meeting in Minneapolis MN. In this newsletter you will find several articles about what has been happening. I would like to talk briefly about a few of them here. Several board members met with the reactor section of the Health Physics Society (HPS) to determine how the two organizations can work together to provide more opportunity for technicians and to aid with the current shortage of technicians throughout the industry. We have been brought onto the ANSI N-13 Standards Committee where we will be able to bring the technologist perspective into future standards. Because of all the work the Center for Disease Control (CDC) has been doing with the H1N1 virus, the development of the volunteer Radiation Safety Technician force has been moving slowly this quarter. You can still volunteer for your local Medical Reserve Core (MRC) to help in times of local emergencies. We had meetings with the leadership of numerous organizations discussing methods of recruiting high school and college students into the nuclear profession.

I want to take a moment to thank our previous Chairman, Kelli Gallion, for all the work she has been doing towards the renewal of our ACE credit recommendation. The organization that controls the program has developed a new category that we had to apply under. This has caused Kelli to have to start from the beginning of the process that we had completed years ago. I feel that that the renewal of our ACE credit recommendation is one of the most important activities happening at this time to aide the registry members.

The next meeting of the **NRRPT** Board and Panel meeting will take place in Albuquerque, NM in conjunction with the HPS Mid-Year meeting, January 23 - 26, 2010. The HPS meeting topic is "Radiation risk communications to the public." Hope to see you there.

Sincerely,  
Dave Biela  
**NRRPT**, Chairman of the Board

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## Welcome New Members

Congratulations to the following individuals who successfully passed the  
**NRRPT** August 1, 2009 examination:

John D. Baird, III  
Jeremy L. Bebb  
John P. Dyson  
Duane E. Gills  
Darin L. Hall

Tyson E. Harker  
Michael K. Kreisher  
Jeffrey B. Kulp  
Jared R. Lees  
Michael J. Long

Lorenzo I. Lovato  
Bruce A. Meffert  
Lowell D. Pittman, Jr.  
Mark S. Smith  
Nathan S. Smith  
Benjamin L. Young

**New Members:** If you do not have access to the "Members Only" portion of the website, please contact the Executive Secretary ([nrrpt@nrrpt.org](mailto:nrrpt@nrrpt.org)). Your email address must be on file in order for you to gain access.

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## Marketing Committee Report

By Rick Rasmussen  
Committee (proxy) Chairman

Following is an edited version of the Marketing Committee Report presented at the 72nd Board of Directors meeting in Minneapolis, MN, July 2009.

### Members Present:

- DeeDee McNeill
- Rick Rasmussen
- Fred DeGroot

### Visitors Present:

- Barry Kimray

### Sponsors:

American Sponsors:

Gold – 4

Silver – 18

Corporate – 6

International Sponsors:

None

### Website:

- Website has been redesigned and is live. All board members and Registrants are encouraged to go to the site and use it – <http://www.nrrpt.org>. Please report to DeeDee all bugs and or non-working items at [nrrpt@nrrpt.org](mailto:nrrpt@nrrpt.org).

### Merchandise:

- DeeDee will explore moving the logo item wear to a local embroidery shop due to the current supplier not being as easy to work with as in the past. They no longer directly ship to the members increasing shipping costs and they no longer allow one item purchases. This is being done to be more service friendly and to support the registrant that would like to order a single item while keeping costs down.
- DeeDee will explore reducing the number variety of items available for purchase. One variety of each: T-shirt, polo shirt, and hat. The exception will be selecting something different for purchase during the sustaining notice. So if you want a particular item – order it now before it is no longer available. This is being done to simplify the ordering and stocking process and to keep costs down for the registrants.
- DeeDee will perform an inventory of the items that she has on hand – sizes and colors of items along with dollar amount. We could potentially list them for sale in the newsletter or on the website.

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**\*\* Write an Article for the NRRPT Newsletter \*\***

You'll receive an NRRPT logo shirt if your article is published

in the NRRPT News

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## Testing, testing...

By Todd Davidson

This feature will present test questions as well as general test-taking strategies and advice. Because the recipients of the **NRRPT** Newsletter have generally passed the **NRRPT** test, this feature should be shared with other workers in the field who have not passed the test. The advice that is given in this feature can be used for any standardized test that is given, particularly those that are based in radiation protection.

This feature will be presented as follows.

- A problem or test-taking strategies will be posted in an article.
- The solution to any problems will be posted on the **NRRPT** website and will be included in the article in the subsequent issue of the newsletter.
  - ◆ If you would like to give novel ways to solve the problem, or have additional advice to add to test-taking strategies, the author will attempt to compile these for future articles.
- If any of you would like to post a problem, regardless of whether you are aware of the solution, please send an email to the **NRRPT** website with the words "Testing, testing" in the subject line. The author will post the problem and solution to share the means to solve the problem.

The first problem follows. This is a classical radiation protection questions, and all who have passed the test or wish to pass the test should know how to solve it.

### Problem

*Given that the effective half-life of I-131 is 7.5 days, what is the biological half-life of this radionuclide?*

As stated earlier, the solution will be posted on the website and will be included in the next installment of this feature in the subsequent newsletter. Good luck to all who wish to test their abilities.

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## By-Laws Committee Report

By Eddie Benfield  
Committee Chairman

The By-Laws committee met on July 13, 2009 at 1300 hours. In attendance at that meeting were: Eddie Benfield; Chairman, Barry Kimray, Chris Whitener, Tim Kirkham, Mark Bayless, and Lindsay Nelsen. The Action Item register was reviewed and there were no outstanding action items needing completion. Chairman completed a total review of the By-Laws prior to the meeting commencing and found that no changes were needed at this time. Individuals attending this meeting were queried if any recommendations/changes needed

to be presented to the Board of Directors for consideration. Lindsay Nelsen was in attendance in order to step into the Chairmanship role during the January 2010 meeting.

Standing Action Item - By-laws of the **NRRPT** shall be reviewed and updates, as required, to remain current with **NRRPT** practices. Point of Contact - By-law Committee Members.

## RP2020 Committee Report

By Eddie Benfield  
Committee Chairman

The RP2020 committee met on July 11, 2009 at 1300 hours. In attendance at that meeting were: Eddie Benfield; Chairman, Dave Biela, Barry Kimray, Tim Kirkham, Dwaine Brown, Bob Wills, Mark Bayless, Todd Davidson, and Chris Whitener. This was a very informal meeting since the Reactor Power section of the Health Physics Society (HPS) was not scheduled to meet until Tuesday, July 14, 2009 to conduct business and presentation of papers related to various work force studies. I spoke with Roger Shaw, Chairman of the HPS-Power Reactor section, and he would still like for the **NRRPT** to be very involved with activities related to supplementing the radiological protection work force and reaching out to potential candidates to support radiological protection activities at various power reactor facilities. Roger invited Eddie Benfield, Dave Biela, Barry Kimray and others to attend the Power Reactor section Board of Directors meeting on Tuesday, July 14, 2009 to begin fostering the relationship and promote the radiological protection profession. The RP2020 committee believes that this could be a win-win situation for both parties and would help in promoting the science of radiation protection to students making decisions about career paths. Roger Shaw is the in-coming Chairman of the Power Reactor section and discussions will begin in earnest to establish this working partnership.

*The following Action Items were discussed and results/decisions documented below:*

- A 2 and 4 year school listing needs to be developed and attached to the Web Page that students interested in the radiological protection field could access with information about available programs. This list will also need to include military type training/programs that students could ask military recruiters about when enlisting for service to our country. Dave Biela volunteered to review previous compiled list for placement on the Web Page.
  - Request Roger Shaw (Chairman - HPS Power Reactor Section) to generate a newsletter article about the urgency of this matter and how the Registry and the Power reactor section will begin in earnest to reconcile the manpower issues. Eddie Benfield will request Roger Shaw to generate this article (see page 10 of this newsletter).
  - A contact needs to be developed with the National High School Guidance Counselors Association. This would allow the RP2020 committee to share information about careers in the radiological protection field and informing this group of impending personnel shortcomings in this important career field. Eddie Benfield will research developing a contact with this organization for dissemination of information related to radiological protection.
- Action Items from San Antonio meeting needing completion:*
- Discussed the need to contact each state and the state's point of contact via Conference of Radiation Control Program Directors' (CRCPD) website ([www.crcpd.org](http://www.crcpd.org)) to find an avenue to educate high school students. -In Progress with Eddie Benfield (Point of Contact)
  - Provide copy of recruitment program to Dale Perkins who will talk with the DOE EFCOG RPM about finding funds. In Progress with Tim Kirkham & Dale Perkins (Point of Contact)
  - Task force with the National Science Teachers Association. This does exist and Todd Davidson will need to contact this organization about being a point of contact for radiation safety and related subjects. New Action Item - Todd Davidson

## A General Review of Health Physics Calculations

### By Augustinus Ong

The purpose of this review, in the format of questions and answers, is to remind ourselves of some of the basic aspects of health physics calculations.

(1) What is the activity of a sample containing  $5 \times 10^{-9}$  P-32 atoms? The half-life of P-32 is 14.3 days.

ANS:  $A = \lambda N$        $t_{1/2} = (14.3 \text{ days})(1440 \text{ min/day})$

$$\lambda = \ln 2 / (14.3 \text{ days})(1440 \text{ min/day})$$

$$N = (5 \times 10^{-9} \text{ mol})(6.022 \times 10^{23} \text{ atoms/mol})$$

$$A = [\ln 2 / (14.3 \text{ days})(1440 \text{ min/day})] \times [(5 \times 10^{-9} \text{ mol})(6.022 \times 10^{23} \text{ atoms/mol})]$$

$$A = ?$$

(2) Acme Hospital specified the need to receive at least 10 mCi of I-131 by next Monday, 10 am. Upon receiving the order, the radiotracer supply company prepares the order on Friday, 10 am for immediate delivery. How much I-131 should be prepared to ensure the hospital receives the 10 mCi of activity on Monday?

ANS:  $A = A_0 e^{-\lambda t}$        $t_{1/2} = 8.04 \text{ days}$

$$\lambda = \ln 2 / 8.04 \text{ days}$$

$$A_0 = A e^{[(\ln 2)(2 \text{ days})] / (8.04 \text{ days})}$$

$$A_0 = ?$$

(3) For a emitter of 1.5 MeV gamma photons, what percentage of the photons would be absorbed by a lead shield of 3 cm thick?

ANS:  $I = I_0 e^{-\mu x}$        $\mu = 0.592 \text{ cm}^{-1}$  (absorption coefficient for lead at 1.5 MeV)

$$I / I_0 = \text{fraction transmitted}$$

$$I / I_0 = e^{-(0.592 \text{ cm}^{-1})(3 \text{ cm})} = ?$$

$$1 - I / I_0 = \text{fraction absorbed} = ?$$

(4) Calculate the resolving time,  $\tau$ , for a G/M monitor that gives the following gross counting rates:

Source 1	7000 cpm
Source 2	3000 cpm
Sources 1 + 2	10100 cpm
Background	50 cpm

ANS:  $t = (R_1 + R_2 - R_{1,2} - R_b) / (R_{1,2}^2 - R_1^2 - R_2^2)$

$$t = (7000 + 3000 - 10100 - 50) \text{ cpm} / (10100^2 - 7000^2 - 3000^2) \text{ cpm}^2$$

$$t = ?$$

(5) Recall that Cerenkov radiation is caused by moving charged particle whose velocity exceeds the velocity of light in a liquid medium. The minimum velocity for a particle to generate Cerenkov radiation is

$$v_t = c_m = c / n, \quad \text{where index of refraction (n) is equal to the velocity of light in a vacuum (c) divided by its velocity in a medium (c}_m\text{).}$$

A common medium used for detecting beta particles is water, which has an index of refraction of 1.332. What is the minimum velocity of beta particles in water?

ANS:  $v_t = (3 \times 10^{10} \text{ cm/s}) / 1.332$

$$v_t = ?$$

(6) A sample yielded 7000 counts in 5 min, and the background was 400 counts in 10 min. What are the standard deviations of the gross, S(g), background, S(b), and net counting rates, S(n)?

ANS:  $S(g) = \text{SQRT}(7000) / 5 \text{ min} = ?$

$$S(g) = \text{SQRT}(400) / 10 \text{ min} = ?$$

$$S(n) = \text{SQRT}[(7000 / 5^2) + (400 / 10^2)] = ?$$

(7) What is the exposure rate, in R/hr, from an I-131 source, that has a specific gamma ray constant of 0.22 R m<sup>2</sup> / hr Ci, at a distance of 5 m if the activity is 8 x 10<sup>10</sup> dpm?

ANS:  $\text{Activity} = 8 \times 10^{10} \text{ dpm} / (2.22 \times 10^{12} \text{ dpm/Ci}) = 3.6 \times 10^{-2} \text{ Ci}$

$$\text{Exposure rate} = [(0.22 \text{ R m}^2 / \text{hr Ci})(3.6 \times 10^{-2} \text{ Ci})] / (5 \text{ m})^2 = ?$$

(8) What is the minimum number, n, of 5 cm thick lead bricks needed to reduce the exposure rate from a 1 Ci, Co-60 source to 5 mR/hr at a distance of 1 m? HVL is 1.2 cm and the specific gamma constant,  $\Gamma = 1.32 \text{ R m}^2 / \text{hr Ci}$ . Inverse-square law can be ignored in this problem.

ANS: Exposure rate at x distance =  $[(1.32 \text{ R m}^2 / \text{hr Ci})(1 \text{ Ci})] / (1 \text{ m})^2$

$$= 1.32 \text{ R/hr}$$

Since the exposure is to be reduced to 5 mR/hr,

Exposure rate,  $X = X_0 e^{-[(\ln 2) n] / \text{HVL}}$

$$X = 0.005 \text{ R/hr} = (1.32 \text{ R/hr}) e^{-[(\ln 2) n] / 1.2 \text{ cm}}$$

$$\ln(0.005) - \ln(1.32) = -[(\ln 2) n] / 1.2 \text{ cm}$$

$$n = ?$$

(9) Assume that 2 mCi of P-32, with an average beta energy of 0.7 MeV/decay, is systemically distributed in a 75 kg man. Calculate the instantaneous, initial dose rate this man would receive.

ANS:  $D_0 = (A_0)(E_{av}) / wt$

$$D_0 = [(2 \text{ mCi})(3.7 \times 10^7 \text{ dps/mCi})(0.7 \text{ MeV/decay})(1.6 \times 10^{-13} \text{ J/MeV})] / 75 \text{ kg}$$

$$D_0 = ? \text{ J/kg s}$$

$$D_0 = ? \text{ Gy/s}$$

(10) At a point near a neutron source, the fast 2 MeV neutron flux is 20 neutrons/cm<sup>2</sup>-sec, and the thermal neutron flux is 600 neutrons/cm<sup>2</sup>-sec. How long can a radiation worker remain at this location if he is not to exceed his maximum permitted dose? A fast neutron flux of 7 neutrons/cm<sup>2</sup>-sec yields 1 mrem/hr and a thermal neutron flux of 260 neutrons/cm<sup>2</sup>-sec yields 1 mrem/hr.

ANS: Fast neutron dose rate is then  $(20 / 7) \times 1 \text{ mrem/hr} = 2.8 \text{ mrem/hr}$

Thermal neutron dose rate is then  $(600 / 260) \times 1 \text{ mrem/hr} = 2.3 \text{ mrem/hr}$

Total dose rate = 5.1 mrem/hr

A worker will accumulate the permitted weekly dose of 100 mrem in time, t, by

$$t = ?$$

(11) A worker was exposed to a burst of 2 MeV neutrons with a total of 10<sup>10</sup> neutrons/cm<sup>2</sup> in the burst. What was his dose?

ANS: A flux of 7 neutrons/cm<sup>2</sup>-sec will yield 1 mrem/hr, so a fluence of  $7 \times 3600 = 2.52 \times 10^4$  neutrons/cm<sup>2</sup> will give a dose of 1 mrem. Therefore, a burst of 10<sup>10</sup> neutrons/cm<sup>2</sup> will give the worker

$$(10^{10} / 2.52 \times 10^4) \text{ mrem} = ?$$



## Professional Pool

By Todd Davidson

This is a new feature for the **NRRPT** newsletter where we will post professional problems that are asked by our fellow practitioners. The respondents can post solutions and/or other challenges to the problem so that readers of the newsletter can use the experience of us all in solving problems at their own place of business.

If you have a problem you would like to ask, please send an email to the **NRRPT** website with the words "Professional Pool problem" in the subject line. If you have a response to the problems presented, please send an email to the **NRRPT** website with an indication in the subject line that it is a response and include the date of the newsletter where the original problem was published. The authors of this feature will do their best to scrub the specifics from the responses and keep them as general as possible.

While we are compiling problems and responses from you the readers, we will start with some paraphrased problems and responses that have already been discussed amongst the **NRRPT** Board and the Examination Panel.

With that out of the way, here we go.

### Problem

*Does anyone have or know where to find data on the science behind the DOE and/or NRC exposure limits? Generally, any studies performed on the potential cancer cases, types, etc. in relation to the regulatory limits is being sought.*

### Responses

*The original regulatory limits were placed in order to protect personnel and the public from deterministic effects (erythema, epilation, cataracts, etc.), particularly those with a threshold.*

*Subsequent to that, the scientific advisory boards made an effort to protect personnel and the public from stochastic effects (solid cancers, leukemia, heritable effects, etc.). Therefore they looked to compare exposure to radiation and radioactive materials that results in contracting a fatal cancer with the likelihood of a fatality in any other job category. Several reports were written with varying intentions and conclusions including BEIR I, BEIR III, and UNSCEAR. The generally accepted value for cancer contraction is  $1e-4$  per rad (or rem). It must be emphasized that the data from which these risks were quantified are all incidents of high dose and high dose rates.*

*Generally speaking, the annual limits that we are currently familiar with were arrived at with the goal to keep stochastic effects roughly equivalent to fatalities in other industries and to ensure that the deterministic effects would not be approached. For example, the limit of 15 rem to the lens of the eye is less than 10% of the threshold for cataracts in the lens. The relationship is similar for the legal limits of other organs and their threshold for deterministic effects.*

The author would like to thank Dave Biela for his excellent question on risk and exposure and the respondents, Michael Boyle and Keith Welch. Any inaccuracies with the wording of the question or the responses can be blamed solely on the author.

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## NRRPT Board & Panel Meeting

The next **NRRPT** Board and Panel Meeting will be held January 23-26, 2009 in conjunction with the HPS Mid-Year Meeting in Albuquerque, NM. All **NRRPT** members are welcome and encourage to attend. For more information regarding the **NRRPT** Board and Panel Meeting, please contact DeeDee McNeill at [nrrpt@nrrpt.org](mailto:nrrpt@nrrpt.org) or 401-637-4811.

## Power Reactor Section (PRS), Health Physics Society By Roger Shaw

Letter to NRRPT Members,

On behalf of the Power Reactor Section (PRS), Health Physics Society, I wanted to send a message to NRRPT members about the PRS, including some of our recent efforts, as well as to illuminate some issues of commonality that present potential partnering opportunities. In essence, I have recently initiated efforts within PRS to foster further collaboration between our two organizations on mutually beneficial issues involving radiation protection, which NRRPT leadership is aware of. As professionals in our respective organizations, the NRRPT and PRS have much in common. Radiation Protection at nuclear power plants presents a unique challenge to health physicists, different than other HP areas of specialty. Of particular importance to all of us is the current human capital crisis we face, of which we are all well aware. While multiple efforts are currently underway in many different quarters, some PRS initial efforts have already begun. At the 2009 Annual Power Reactor Section Executive Board meeting held in conjunction with the July 2009 Annual Health Physics Society meeting in Minneapolis, we were pleased to have Dave Biela and Eddie Benfield attend the meeting, and provide input on some key issues related to manpower shortages. Recent efforts by the PRS include sponsoring a student to attend the NEI HP Forum, and a contribution of \$2,200 for the preparation of a DVD by HPS to promote student interest in choosing careers in health physics, to be made available through a number of outlets. Further information on the DVD will be forthcoming. To further illustrate the manpower problem, it was reported at the NEI HP Forum in August that with the planned 34 refueling outages at US nuclear plants for the remainder of the year, there is an estimated shortage of 15 to 20% RP personnel shortages, mainly with HP technicians. There are a number of reasons for this and the industry has stepped up efforts to deal with this growing problem, with NEI playing a key role along with the companies that provide manpower services.

At the heart of our commonality is our mission to practice radiation protection, and for PRS that relates specifically to nuclear power plants. Due to the anticipated resurgence of nuclear power both in the US and abroad, PRS sponsored a Special Session at the 2009 HPS Annual Meeting, entitled *Radiation Protection in a Nuclear Power Renaissance*. This new reactor build effort is occurring at a time when additional clean energy alternatives are needed worldwide, and with respect to the radiation protection profession, this global effort also faces an HP manpower crisis. The session was also designed to allow health physicists who work within and outside of the nuclear industry the opportunity to hear first hand the key issues associated with advanced power reactors and facets of the associated radiation protection programs. It was also intended for HPs who may otherwise have not considered a career in the nuclear power industry a window into some of the challenges facing their colleagues having responsibilities for power reactor radiation protection, including those related to radiological engineering and ALARA. The Special Session, attended by over 200 HPs, included 6 presentations related to manpower, particularly with respect to college programs that have cooperation programs with various nuclear utilities. Along with those in academia, excellent presentations were made by NRC, NEI, INPO, EPRI, DOE, OECD/Nuclear Energy Agency and nuclear utility representatives on a variety of topics. While this was an all-day session, a number of papers had to be turned down, and one notable topic that could not be addressed is the new interest in modular reactors or "mini-nukes", although organizations such as ANS have been active with this new technology approach. As part of the HPS Newsletter of April 2009, I extended a special invitation to NRRPT members to attend the Special Session, and am happy to note that some members were able to do so.

Another aspect of our activities is POWERNET, the PRS list server, including over 300 subscribers, in operation since 1997. The current list of subscribers includes regulators, nuclear power plant staff, vendors, academics, and

other interested HPS members. Subscribers do not have to be members of HPS or PRS, but access is normally restricted to members of the power reactor community, and does not include members of public interest groups. Anyone wishing to subscribe should send an email to [mike.russell@sce.com](mailto:mike.russell@sce.com).

To provide some brief background on the PRS, the 2008-2009 HPS Directory lists approximately 250 members for our section. The PRS provides two membership options, "Section" (for HPS members) and "Section Only Members". Section members are also members of the national Health Physics Society (\$115 annual dues). Section Only Member's dues are \$65 per year. Section Only Members receive the HPS Newsletter and the HPS Membership Handbook & Directory, but not the Journal, and may hold office and vote in Power Reactor Section elections.

One of our primary initiatives is to invite **NRRPT** members to join the Power Reactor Section of HPS, noting that there are no Section Only Members at this time. In light of this, the PRS is currently interested in attracting more non-HPS members, particularly from the **NRRPT** membership ranks. To apply for membership, just visit the HPS website ([www.hps.org](http://www.hps.org)) and open the "Join the HPS" tab. It is best to apply after October 1 this year for 2010 membership. Of course, anyone wishing to join HPS can do so using the same link.

Again, the PRS looks forward to improved and further interface with the **NRRPT** and your input is appreciated.

Sincerely,  
Roger P. Shaw, CHP  
President, Power Reactor Section  
Health Physics Society  
*Roger Shaw is a Scientist with the law firm of K&L Gates ([www.klgates.com](http://www.klgates.com))*

**2010 USA  
NRRPT Exam Dates**

**February 20, 2010** - Deadline for application: December 31, 2009

**August 7, 2010** - Deadline for application: June 11, 2010

**2010 Canadian  
NRRPT Exam Dates**

February (TBA) 2010 - Deadline for application: December 31, 2009

Application Fee: \$250

Retake Fee: \$125

Late Fee: \$50



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*(\*Please reference NRRPT when sending in your resume)*

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james.madigan@sce.com

**San Onofre Nuclear Generating Station is proud to have over 60 registered NRRPT members in our Health Physics, Training, Chemistry, Engineering, Operations, Oversight, and Maintenance organizations. We are especially proud that Kelli Gallion of our HP Planning group was a member of the Panel of Examiners, Board of Directors, and was formerly the NRRPT Chairman.**

**San Onofre is a three unit site with two operating 1170 MWe Combustion Engineering reactors and one early Westinghouse unit in decommissioning. The station is located in Southern California on the Pacific Ocean and midway between San Diego and Los Angeles.**

## **Studsvik**

5605 Glenridge Drive, Ste 705  
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### AmerenUE-Callaway Plant

Bob Farnam  
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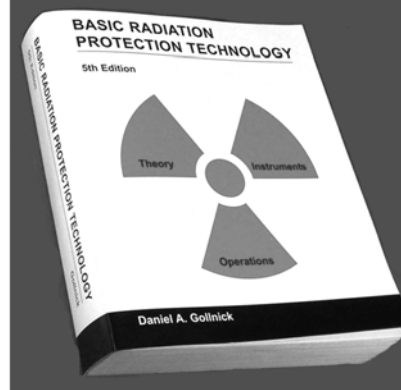
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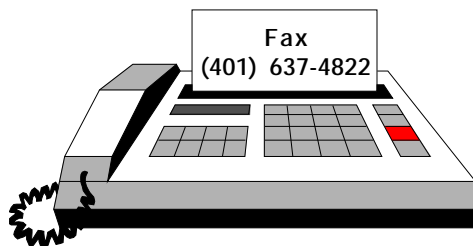
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