

NRRPT® NEWS

National Registry of Radiation Protection Technologists

Spring 2010 Edition

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Chairman's Message



Dave Biela

I am in the second month of my final year as the NRRPT Chairman. Kelly Neal will be taking over as Chairman on the first of January 2011. I want to take this opportunity to thank all the members of the Board and Panel that have made my years as Chairman go so smoothly. A lot of people do not know that all Board and Panel members are volunteers that put in a lot of time and effort in support of the

organization. I also want to thank the companies that support these individuals.

We have just completed the 73rd Board meeting in Albuquerque, NM and will include reports from the committee chairs throughout this newsletter. What I wanted to talk about is some of the actions that we will be working on over the next few months to help the Registry. The objective of the Registry is to encourage and promote the education and training of Radiation Protection Technologists and, by doing so, promote and advance the science of Health Physics. To help achieve this goal we are putting together a list of schools from the United States and Canada that offer programs that can help advance members of the Registry. We have also received the first of five checks in the amount of \$10,000 from Cabrera Services Inc. to be used exclusively for scholarships to help registered members with their education. If you are registered in or are planning to register for classes in the field of Health Physics you can apply for scholarship money online at www.nrrpt.org. All applications will be reviewed for eligibility at the next meeting in June in Salt Lake City, UT.

If you currently know technicians that have been in the profession for at least 5 years and have not sat for the **NRRPT** exam yet, encourage them to sit for the August exam. Help them to prepare for the exam. Be part of

the effort to encourage these technicians to better themselves. My basic message since I became Chairman of the **NRRPT** has been the same. Work hard and be the best technician you can and help other technicians to better themselves.

Sincerely,
Dave Biela
NRRPT, Chairman of the Board



Dave Biela and Lorenzo Cabrera

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

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

in the **NRRPT** News

Testing, testing...

By Todd Davidson

Welcome again to the feature "Testing, testing." As stated previously, this feature will present test questions as well as general test-taking strategies and advice. If you find value in this feature, please share this with others in the field who have not passed the **NRRPT** 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.

Onwards to problem two. This is a classical radiation protection question, and all who have passed the test or wish to pass the test should know how to solve it.

Problem

Given a radiation source with a dose rate of 50 R/h at one foot, a shield that is 7.5 half-value layers thick, and the dose rate of 1500 mR/h on the opposite side of the shield, what is the buildup factor?

The solution will be posted on the website and will be included in the next installment of this feature in the next newsletter. Good luck to all.

Professional Pool

By Todd Davidson

In this feature, the author will present ideas and solutions to practical problems that face professionals in the field of radiological protection and science. Generally, questions that have been presented to the board and panel will be shared with the readers. At times, the particular solutions from various responders will be included as well.

In this particular case, we are asking you, the readers to respond. I will post the responses from the readers in a subsequent newsletter article.

Problem

At a site, the RCTs are required to record the value of the high voltage as part of the daily operational check. For Ludlum model 3's and 12's, the high voltage is graduated in 0.1 kV (100 V) increments, however the control tolerance that is used is ± 10 V from the nominal calibration level (900 V).

If this is a problem at other sites, what is the solution?

The author will state responses from the readership and from his own site in a subsequent article. Please feel free to respond to me at t-davidson@sbcglobal.net.

Save the Date!

NRRPT Board & Panel Meetings
June 26 - 29, 2010
Salt Lake City, UT
Hilton Salt Lake City Center

** All NRRPT members are welcome and encouraged to attend **

Arthur F. Humm, Jr. Award Presented to DeeDee McNeill



Bob Wills and Dave Biela present the Humm Award to DeeDee McNeill

The 2009 Arthur F. Humm, Jr. Award was awarded to DeeDee McNeill at the 73rd Board of Directors/Panel of Examiners meeting in Albuquerque, NM on January 24th, 2010. DeeDee has provided over 20 years of service to the Registry and has touched all of us through dedication and support.

This award is provided to an individual who has shown outstanding support to the Registry, the Board or Exam Panel. With this understanding, the Awards Committee and Board of Directors unanimously agreed that DeeDee McNeill exemplifies the level of support this award represents. From all of us DeeDee, "Thank you and a job well done"!!

Thank You!

Bob Farnam

For your dedication and commitment to the NRRPT as Newsletter Editor since 1996!

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.

(Q1) A researcher is removing a 0.5 Ci Cs-137 source from an opened storage safe, which is on a working bench. She approaches the safe at a rate of 100 cm/s. It takes her 2 minutes to remove the source using a 30 cm long forceps and then place the source in a lead container. Estimate her dose while approaching the source and her dose while removing the source.

Ans:

First estimate Γ , the specific gamma constant, based on 0.661 MeV photon from ^{137m}Ba with a 89% emission.

$\Gamma = 0.5 \sum f_i \times E_i$ [R x m² / Ci-hr], where f_i is the fraction of total emission per decay and E_i is the energy of the emitted photon.

$$\Gamma = 0.5 \times 0.89 \times 0.611 = 0.28 \text{ R x m}^2 / \text{Ci-hr}$$

Use the following dose equivalent equation for determining her dose she receiving while approaching the source:

$H = \Gamma \times A \times w_r / v \times d_o$, where A is activity in Ci, w_r is the radiation weighting factor (equals to 1 in this example), v is the speed of travel, and d_o is the handling distance to source.

$$\begin{aligned} H &= (0.28 \text{ R x m}^2/\text{Ci-hr}) \times (0.5 \text{ Ci}) \times 1 \times (1 \text{ rem/R}) / (1 \text{ m/s}) \times (3600 \text{ s/hr}) \times (0.3 \text{ m}) \\ &= 1.3 \times 10^{-4} \text{ rem} \end{aligned}$$

Now find the dose equivalent during the removal of the source:

$$\begin{aligned} H &= \Gamma \times A / d^2 \\ &= [(0.28 \text{ R x m}^2/\text{Ci-hr}) \times (0.5 \text{ Ci}) / (0.3\text{m})^2] \times 1 \text{ rem/R} \\ &= 1.555 \text{ rem /hr} = 1.555 \text{ rem /hr} \times 1 \text{ hr}/60 \text{ min} \times 2 \text{ min} \\ &= 0.052 \text{ rem} \end{aligned}$$

(Q2) A 2 meter long cylinder, lying lengthwise on a bench in a physics laboratory, is known to contain Co-60 along its entire length at a concentration of 0.2 Ci per meter. What is the exposure rate to a physicist working at another nearby bench 2 meters away from the cylinder? $\Gamma = 1.32 \text{ R x m}^2/\text{Ci-hr}$

Ans:

Using the following dose to a person from a line source:

$D = (\Gamma \times C / h) \times [(\tan^{-1} l_1/h) + (\tan^{-1} l_2/h)]$, where C equals linear concentration of activity, h equals distance to source, l = length of source with respect to the exposed person.

Since the angle of the exposed person's position relative to the source is not known, the angle is found using the inverse tangent relationship and assuming the person is in the line-of-sight to the middle of the cylinder.

$$D = [(1.32 \text{ R} \times \text{m}^2/\text{Ci-hr}) \times (0.2 \text{ Ci/m}) / 2 \text{ m}] \times [\tan^{-1}(3\text{m}/2) / 2 \text{ m}]$$

$$D = 4.87 \text{ R/hr}$$

(Q3) Approximately 0.25 mCi solution of Co-60 from the same cylinder leaks on a circular area of 1 m diameter. What is the exposure rate at the surface of the spill? Assuming there is no backscatter from the floor, the air attenuation coefficients for 1.17 and 1.33 Mev photons are $3.1 \times 10^{-5} \text{ cm}^{-1}$ and are $3.3 \times 10^{-5} \text{ cm}^{-1}$, respectively.

Ans:

First calculate the concentration:

$$C = 0.25 \text{ mCi} / \pi (50 \text{ cm})^2$$

$$= 3.18 \times 10^{-5} \text{ mCi/cm}^2$$

Using the following exposure rate from a plane source:

$X = 0.5 C E$, where 0.5 is half of the emission is upward and half is downward, C is the concentration, and the E equals to the photon energy per emission.

$$X = 0.5 \times 3.18 \times 10^{-5} \text{ mCi/cm}^2 \times 3.7 \times 10^7 \text{ dps} \times [1.17 \text{ Mev/dis} \times 3.1 \times 10^{-5} \text{ cm}^{-1} + 3.3 \times 10^{-5} \text{ cm}^{-1}] / [(\text{hr}/3600 \text{ s}) \times (1 \text{ MeV}/1.6 \times 10^4 \text{ erg}) \times (1.293 \times 10^{-3} \text{ g/cm}^3) \times (87.9 \text{ erg/g-R})]$$

$$X = ?$$

(Q4) The Rule of 7 and 10. The dose rate from a liquid sample containing fresh fission product from a criticality accident was 1000 mrad/hr 10 min after the accident. What will be the dose rates at 70 min after the accident. How long until the dose rate is 5 mrad/hr?

Ans:

The Rule 7 and 10 applies only to fresh fission products from a fission accident. In such case, the dose rate is proportional to time, $t^{1.2}$.

Using the following relationship:

$A_1 / A_2 = (T_1)^{-1.2} / (T_2)^{-1.2}$, where A equals activity and T equals time

$$A_2 = A_1 \times (T_1 / T_2)^{1.2}$$

$$A_2 = 1000 \text{ mrad/hr} (10 \text{ min} / 70 \text{ min})^{1.2}$$

$$= 98.8 \text{ mrad/hr}$$

The dose rate equals 5 mrad/hr at time:

$$A_1 / A_2 = (T_1)^{-1.2} / (T_2)^{-1.2}$$

$$1000 / 5 = (10)^{-1.2} / (T_2)^{-1.2}$$

$$T_2 = 563.45 \text{ min post accident}$$

Photos from the NRRPTBoard & Panel Meetings in Albuquerque, NM



Panel Meeting
Keith Welch & Dave Tucker



Panel Meeting
Rick Rasmussen

Marketing Committee Report

By Rick Rasmussen

Attendees

Rick Rasmussen (Acting Chairman)
Fred Degrooth
DeeDee McNeill
Kelli Gallion
Kelly Neal
Dave Tucker

Guests

Barry Kimray
Terry Lafreniere

Sponsors - United States

Corporate: 5
Silver: 17
Gold: 2

Sponsorship dollars are down from the previous years.

Sponsors - International

None

Website

The new design looks good and is much easier to read than the previous design. All Board members and

registrants are encouraged to visit the site at <http://www.nrrpt.org> and test drive it. Please report any errors and non-working items to DeeDee McNeill.

Open Action Items

DeeDee was tasked with finding a local embroidery shop to replace the mail order vendor since she will no longer direct ship orders. She found a local vendor whose pricing is equal to or slightly less than the mail order vendor. She used the local shop to order the sweatshirts and was happy with the pricing and quality and will use the local embroiderer for all future orders.

The **NRRPT** will celebrate its 35th anniversary in 2011 and to commemorate this very special occasion the Marketing Committee is requesting funds for polo shirts to be available for purchase to registrants paying their sustaining fees starting in January 2011.

DeeDee is exploring using conference calls, web meetings or other media to conduct committee meetings and other NRRPT business between meetings to be more efficient and save costs.

2010 NRRPT Sustaining Dues

Ask your fellow Registrants --
"Have you paid your 2010 dues?"

It's not too late to submit your 2010 sustaining dues and be included in the 2010 Handbook! If you haven't paid yet, please submit to the Executive Secretary's office as soon as possible!

Awards Committee Report

By Bob Wills

The **NRRPT** winter meeting went very well and the Awards Committee has some wonderful news. Let's start off with education support to our membership. The Board of Directors feels strongly that education support to our membership is the cornerstone of the **NRRPT**. The Don Marshall Scholarship fund is the vehicle used to support our members with financial support for advanced study in the field of health physics. The **NRRPT** has been awarded a 5 yr gift of 10K/yr for five years by the Cabrera Services. I hope that our membership will take full advantage of this gift and apply for scholarship funding. You can contact DeeDee McNeill or myself for more information regarding the qualifications for his award.

Arthur F. Humm, Jr. Award

The Arthur F. Humm Jr Award is presented to an individual who has shown outstanding support to the registry, the Board or Exam Panel.

2009 Recipient: The award was presented to DeeDee McNeill at the Albuquerque, NM Meeting. DeeDee has provided over 20 years of support to the **NRRPT** and has touched all of us with her dedication and help. With the understanding of the award, the Awards Committee and Board of Directors felt that DeeDee McNeill exemplified the kind of support this award calls for. From all of us DeeDee "A job well done".

2010 Recipient: The Awards Committee nominated Dave Tucker for his outstanding support in coordinating, writing, and implementing the Canadian Exam. The Awards Committee feels that Dave has shown the kind of dedication and vision that exemplifies this award. The award will be given at the Salt Lake City 2010 meeting.

Charles D. (Bama) McKnight Award

The Charles D. (Bama) McKnight Award is presented to persons who have given outstanding efforts in the radiation protection training field leading to increased knowledge and professionalism among Radiation Protection Technologists.

The Awards Committee nominated Mike Davidson from Tidewater Ches-Nuc. Mike has been a member of the **NRRPT** since 1987 and has been a strong supporter of the **NRRPT** in his efforts to support training for the exam.

Mike's contribution to training comes in the form of an **NRRPT** preparation course. Over 1000 candidates have taken Mike's training course (with over 80% passing the exam). Mike has a degree in education and therefore his teaching style and training is advantageous to our adult population taking this exam. Mike has excelled in training health physics students. His efforts have been instrumental in preparing many **NRRPT** candidates for passing the exam.

New Fellow Members

For outstanding support to the Board and Panel we awarded Kelli Gallion as Fellow Member. We appreciate her dedication and look forward to her continued support to the **NRRPT** organization.

Photos from the NRRPT Night-Out in Albuquerque, NM

The NRRPT "Night-Out" has become a tradition for Board & Panel members and family & friends of the Registry. Over 30 people attended the dinner and awards ceremony in Albuquerque, NM. This tradition continues due to the generous contributions of our "Night-Out" sponsors and supporters.
Many, many thanks to them!!

Night-Out Sponsors:

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DeNuke
Duke Energy
Master-Lee Decon Services
Tidewater Ches-Nuc



Our representing sponsors (left to right)
Barry Kimray, Tim Kirkham, Eddie Benfield, Ken
Baugh, Todd Davidson, Tom Hansen, Rick Largent
and John Arrowsmith (not pictured)



Arthur F. Humm, Jr. Award recipient DeeDee McNeill
and Fred DeGrowth



The "Group"



Todd Davidson and Kelli Gallion



Karen Barcal and Eddie Benfield



Beckie Thomas and Dave Kent



Rick Rasmussen and Fred DeGrowth



Rick Largent and Kelli Gallion



Eddie Benfield, Beckie Thomas & Barry Kimray

Registration Maintenance Program

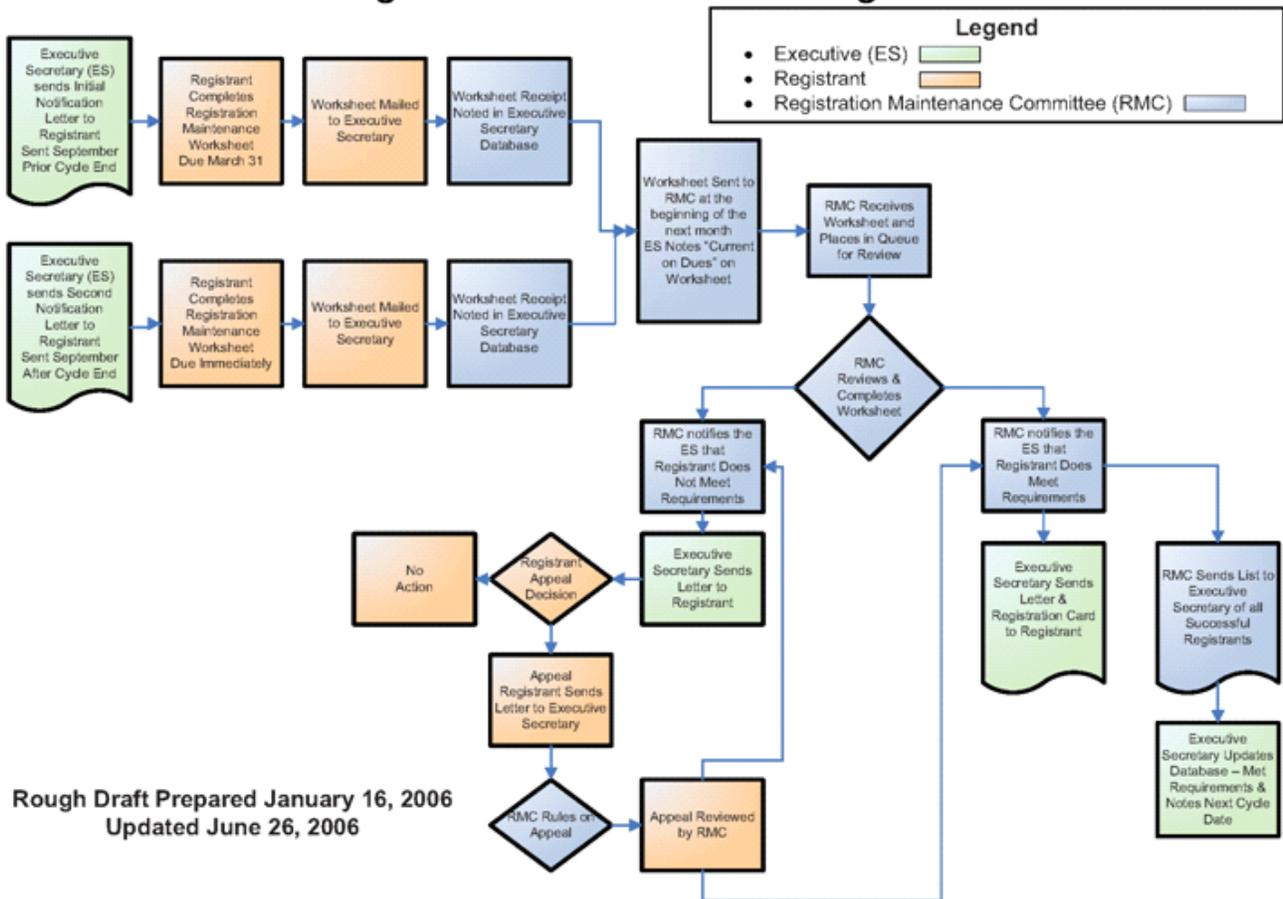
An explanation of how the system works and your options

Overview

The registration maintenance program was created so that RRPT's could maintain their professional qualification. This program requires the Registrant to participate in professional development throughout the maintenance cycle. The program requires 20 points during the five (5) year cycle. There is not a minimum per year amount of points needed as long as the registrant has the required 20 during the cycle.

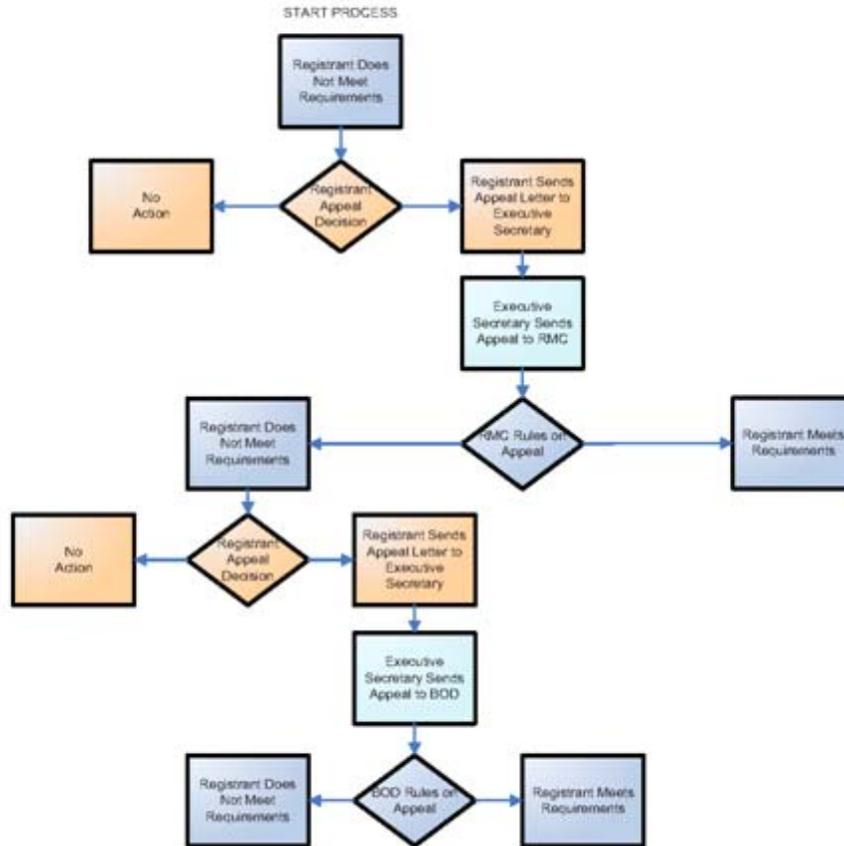
Registrants will fill out the maintenance worksheet either on paper or online at the NRRPT website. The registrant fills out the maintenance worksheet for the cycle that ended the previous year. In no case will points be awarded for future credits. When completed, the worksheet will be sent in for review by one of the Registration Maintenance Committee members. If it has been determined the registrant does not meet the necessary requirements, he or she will be notified by mail and their options for appeal will be explained. The flow chart below explains the Registration Maintenance process as well as the process for appeals:

NRRPT – Registration Maintenance Program Flow Chart



Registration
Maintenance
Program

Appeal Process



Note: If the initial reviewer wishes to reject the worksheet, it is sent to the Registration Maintenance Committee Chair for review. If the Chair concurs the worksheet will be rejected. In essence all rejected worksheets will be reviewed at least twice.

**2010 USA
NRRPT Exam Dates**

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

**2010 Canadian
NRRPT Exam Dates**

February (TBA) 2011

Application Fee: \$250, Retake Fee: \$125, Late Fee: \$50

NRRPT Membership Status Levels

Registered Practitioner

A registered practitioner is a member that has satisfied all their registration maintenance requirements or that has not yet come to the conclusion of their first cycle. In addition, a registered practitioner is current on their annual dues.

Registered Supporter

A registered supporter is an annual dues paying member that has not maintained their registration requirements.

Retired

A retired member is a non-dues paying member and no longer practices in the radiation protection field. The Registry maintains a list of retired practitioners as a convenience for other Registry members that may need to contact those persons.

Deceased Members

The NRRPT, in memory of deceased members, maintains an up to date listing of past and present practitioners in the radiation protection field. The Registry maintains a list of deceased members in their handbook and encourages all practitioners to report the passing of any members to the Executive Secretary for inclusion in the list.

Awards bestowed by the NRRPT

Arthur F. Humm, Jr. Award

This award is presented to persons who have given outstanding support to the NRRPT. The Awards Committee is chartered to deliberate on potential nominees for this recognition at least annually. However, the award is not made at any established frequency; the frequency of this award is at the sole discretion of the Board of Directors.

Don Marshall Scholarship Award

This award may be presented to one or two registered members each year, who are planning on attending an accredited educational institution in a course of study in Health Physic or a closely related technical discipline. Applications for the Don Marshall Scholarship Award can be printed from the NRRPT Web site.

Charles D. (Bama) McKnight Memorial Award

This award is presented to trainers/instructors in the radiation protection field who have demonstrated outstanding efforts to increase knowledge and professionalism among Radiation Protection Technologist. The recipient of this award must be a current member of the Registry and in good standing. The Awards Committee accepts nominations for this award from the members of the Registry and presents recommended recipients to the Board of Directors for approval.

Fellow Members

Members who have given outstanding service to the NRRPT in the form of educational, administrative or scientific contributions. The Fellow candidate must have served at least one term on the Board of Directors or the Panel of Examiners. They must also have served as Chairman or similar position on one or more NRRPT committees. The Fellow must be a strong supporter and actively promote the goals, programs and benefits of the Registry. Fellows will be afforded all the privileges of Registered Practitioners but do not have to pay annual dues. Current or present Board or Panel members may submit a candidate, for Fellow, to the Awards Committee. If the Awards Committee approves, the committee will present the candidate to the Board of Directors.

Continued on page 15

Why Am I Being Audited?

By Todd Davidson

So you have completed your maintenance worksheet for your latest cycle of being a Registered Radiation Protection Technologist. You have taken the time to go over what you have been doing for the last five years. You have noted all the work you have done, the training that you have taken part in. You have listed all the questions that you have added to the **NRRPT** test bank, the time that you have spent in committees, the radiation protection tests that you have passed, etc.

And now you are being asked to provide proof? What is this about?

This year, the **NRRPT** will be performing an audit of the registration maintenance process. As a result, the committee that performs this function will require a randomly chosen population of the registrants whose cycle ended in 2009 to provide proof of the items that they are claiming for registration maintenance.

Five percent of the registrants will be chosen randomly and will be required to provide documentation. If you are chosen, you will be notified sometime after the beginning of April of 2010. You will have 60 days to provide the documentation required. PLEASE respond promptly. The audit process can be cumbersome, and having all information promptly will make the process go that much smoother.

The committee may have to resolve questions or problems reviewed during the audit. If there are questions/problems generated during the audit, you will be contacted as necessary. We ask that you remain patient with us as we perform the process.

If any of you have questions about the registration maintenance process or the audit thereof, please feel free to contact us: DeeDee McNeill: nrrpt@nrrpt.org
 Author: t-davidson@sbcglobal.net.

Continued from page 14

Member Emeritus

A member emeritus is one who has made sustained and substantial contribution(s) to the Registry. A member emeritus must be a registered member who has reached the age of 60 years or more and is no longer active in the radiation protection field because of a disability or retirement. A member emeritus also must have been an active member of the Registry for at least 10 years prior to application. Member Emeritus status conveys all the privileges afforded a registered practitioner without having to pay annual dues.

These are brief overviews of the membership status levels obtained through involvement in the **NRRPT**. The awards described above are obtainable by either registered members or non-registered supporters of the organization. The Awards Committee always welcomes solicitation from the Registry for persons they believe may be fitting of one of the aforementioned awards. To nominate a person for one of these awards, please e-mail Bob Wills, Awards Committee Chairman, at robert.will@gel.com and note on the subject line as **NRRPT Awards Nomination**. Also, remember that some of the above awards and membership statuses have forms that are available from the **NRRPT** web site that should be completed and forwarded to the Executive Secretary for routing to the Awards Committee.

NRRPT 2008 - 2009 Salary Survey

By Robert Wills

Dear Members: As you may remember, the Board of Directors requested a salary survey in 2008. It is my pleasure to report the results of that survey to our membership. It has taken several months to get enough replies to feel we have a good understanding of the salary range across the different geographical locations and employers. I hope this data will help our membership in future guidance for employment and advancement.

I received 62 replies for working RRPT's in all discipline groups:

- | | |
|--|---|
| <p>1. Experience by Education:</p> <ul style="list-style-type: none"> 10% High School 25% Associate Degree 40% Bachelors Degree 20% Masters Degree 5% PhD | <p>5. Field of Employment</p> <ul style="list-style-type: none"> 20% Federal Government 5% State Government 5% Medical Facility 45% Power Reactor 25% Government Contractor <1% University |
| <p>2. Years Employed</p> <ul style="list-style-type: none"> 5% < 6 years 35% 6 to 15 years 60% > 15 years | <p>6. Location of Employment</p> <ul style="list-style-type: none"> 35% North East 40% South East 10% South West 15% West Coast |
| <p>3. Are you a CHP</p> <ul style="list-style-type: none"> 70% No 30% Yes | <p>7. Salary Range per year by Job Grouping</p> <ul style="list-style-type: none"> 25% \$45,000 to \$65,000 (State Government and University) 40% \$65,000 to \$85,000 (All Others) 35% \$85,000 to \$100,000 (All Others) |
| <p>4. Job Responsibility</p> <ul style="list-style-type: none"> 30% Technician 45% Supervisor 15% Professional Staff / Radiological Engineering 5% RPM/RSO 5% Medical RSO | |



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San Onofre Nuclear Generating Station is proud to have over 30 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.

AmerenUE-Callaway Plant

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Detroit Edison Fermi 2

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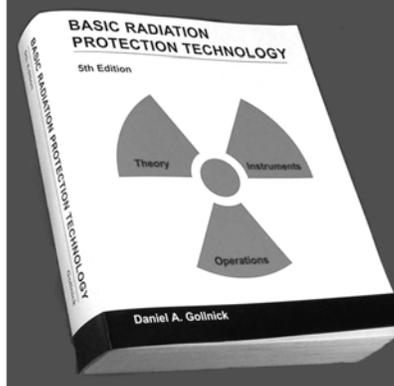
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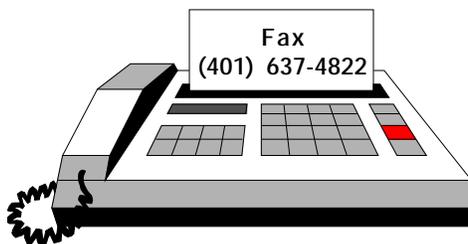
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