NRRPT® NEWS

National Registry of Radiation Protection Technologists

December 2011 Edition

Incorporated April 12, 1976

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Chairman's Message

Kelly Neal

I would like to begin by thanking Barry Kimray and Bob Wills for their continued service to the NRRPT as their elected terms on the Board of Directors expire (although Barry has been extended an additional three months to assist in the transition to his successor). In addition to their Board positions, Barry has served as Secretary-Treasurer for the last four years and Bob has served as Vice Chairman this past year. Additionally, Karen Barcal is transitioning from her role as Chairman of the Exam Panel, where she has served since 2006, to an elected Board position.

I would also like to welcome Dave Tucker as Vice Chairman of the Board, Chris Whitener as Secretary-Treasurer and Rick Rasmussen as Exam Panel Chairman. In addition to Karen Barcal, past Board Chairman Kelli Gallion will be rejoining the Board of Directors effective January 1, 2012.

On a sadder note, the Registry has lost a strong supporter with the passing of Dr. George Vargo. Those of us fortunate enough to have known George will certainly miss him.

Please remember that our next Board and Panel meetings will be held in conjunction with the Health Physics Society midyear topical meeting February 4-7, 2012 in Dallas, TX. Please stop by and visit; better yet, come join us in the meetings.

Congratulations to our newest members (see page 2 for listing) who successfully passed the August 6th exam.

Thank you all for your continued support of the Registry.

Sincerely,
Kelly Neal
NRRPT, Chairman of the Board

Dear Membership,

It is with great sadness we report that Dr. George Vargo, a strong supporter of the Registry, passed away November 20, 2011. He had been involved with the NRRPT for a number of years, noting that a strong radiation protection program has knowledgeable and well-trained technicians. With many accomplishments and awards to his credit through the HPS, AAHP and ABHP, he was always lending a helping hand and had a philosophy of "paying it forward". He was a mentor to many, helping take operationally savvy individuals to the next step in Health Physics. In recent years, Dr. Vargo provided an independent assessment of materials used and developed by the Registry. Those of us privileged to know him will miss his sense of humor, his dedication and his wise advice. Our thoughts and prayers go to out to his family and friends. Please see his memorial on page 7.

Welcome New Members

Congratulations to the following individuals who successfully passed the NRRPT examination on August 6, 2011:

Ashley L. Booth
Steven A. Coleman
Carlos E. Corredor
Gregg D. Dillingham
Chester R. Doughty
Edward A. Finley
Milton P. Huff
Chris D. Jones
Tiara C. Kissam
Shari C. Mask
Sanjoy Mukhopadhyay
Roy R. Racino
Carlton D. Ricketts
Christopher P. Stayman

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

2012 NRRPT Sustaining Dues

Ask your fellow Registrants -- "Have you paid your 2012 dues?"

It's not too late to submit your 2012 sustaining dues and be included in the 2012 Handbook! If you haven't paid yet, please submit to the Executive Secretary's office as soon as possible!

Energy Specific Calibration of the Tennelec Alpha/Beta Proportional Counters

Tim Kirkham, RRPT

The following article is taken from a white paper developed regarding the calibration of a Tennelec alpha/beta counter. The company name has been changed to protect anonymity. UNKLAB calibrated its Tennelec instruments using Strontium–90 (Sr-90) but the question arose if this was the proper calibration source for the site.

Summary

An analysis of the energies for beta emitting isotopes identified in the UNKLAB Part 61 analysis was performed to determine the estimated average energy of beta-emitting radionuclides in routine samples. (See Table 1 below). The evaluation found the average beta energy for isotopes in the UNKLAB inventory to be less than that of the average energy of the current calibration standard, Sr-90 in secular equilibrium with Y-90. Sr-90 has an average beta energy of 195 keV and Y-90 has an average beta energy of 933 keV (BNL), which is significantly greater than the average energy of beta emitting isotopes expected to be found at UNKLAB. Therefore, basing the instrument efficiency on Sr-90/Y-90 introduces a systematic underestimate in the gross beta activity measurement. Additionally, an evaluation of the best suited calibration isotope was performed and based on beta energy, half-life, and availability as a calibration standard, it was determined that Technetium–99 (Tc-99) is the appropriate isotope for the Tennelec beta efficiency calibration. Tc-99 has maximum beta energy of 293 keV, with the average beta energy 85 keV (BNL), which more closely approaches the average beta energies found at UNKLAB. The Health Physics Group recommends that the efficiency for gross beta measurements of solid materials including wipes on efficiency calibrations should be determined by the use of Tc-99 for instrument efficiency.

Approach

Two issues are involved in the determination of the correct source for calibration;

1. The average energies of isotopes present at the site
2. Recommended EPA methods for known, required, analyses.

To determine the average energy, an analysis must be performed to determine the radioactive characteristics of contaminants on site (see next section). The required EPA methodology for counting water in the system requires the use of Sr-90 (EPA Method 900.0). No other EPA methods are available for counting smears and air samples.

Determination of UNKLAB Average Energies

Three areas of concern exist at UNKLAB regarding the possibility of generating isotopes and mixes of isotopes that will be analyzed in the UNKLAB Count room: area 1, area 2 and area 3. 10CFR61 samples were taken in area 2 and area 3 in recent history (2007 and 2011 respectively) for use in waste characterization. The last time samples were collected in the 100 area was in 1999 – to far in the past to be useful.

Smears were taken in representative areas of area 1 in order to perform the “part 61” analysis. Results were received from the vendor and this data was evaluated along with data from areas 2 and 3. Special emphasis was placed on the determination of the average beta energy in each area to verify proper calibration of the beta instrumentation.

The table below summarizes the isotope energy analysis results.

Table 1

Location	Date of last analysis	Average β energy (keV)
Area 1	July 2011	150
Area 2	January 2011	106
Area 3	October 2010	106
	Average ± 95% CL	120±110

The Tennelec instrument in the instrument lab provides gross alpha and beta results for air samples from each of the three areas listed, shipping, and environmental samples (the three areas listed above provide the sample input for any potential environmental releases).

Standards and Recommendations

NUREG-1507, Minimum Detectable Concentrations with Typical Radiation Survey Instruments for various Contaminants and Field Conditions, recommends that calibration source standards be selected that emit alpha or beta radiation emissions with energies comparable to those expected from the contaminant in the field.

As is already known, in the case of beta emitting radionuclides, the beta efficiency of the counter varies as a function of energy. ANSI-N42.25, Calibration and Usage of Alpha/Beta Proportional Counters, states that a conservative approach to the use of alpha/beta proportional counters for measuring gross activity is to calibrate with the radionuclide having the lowest maximum beta energy anticipated to be present in the samples. Table 2 compares different possible calibration radionuclides and energies in table form with the UNKLAB average.

Table 2 (data from BNL National Nuclear Data Center)

Radionuclide	Average β energy (keV)	Max β energy (keV)
Sr-90/Y-90	195/934	546/2284
Cs-137	174	1176
UNKLAB	100 to 150 (average 120 ±110)	
Tc-99	85	294

Conclusion

Based on the data presented above it was strongly recommended that the efficiency calibration of the Tennelec alpha/beta monitors be performed with a Tc-99 source. The energy of the Sr-90/Y-90 source is obviously too high; using the Sr-90/Y-90 source assumes a beta efficiency of approximately 50%, which will non-conservatively underestimate the gross beta activity (potentially by a factor of 2). The Cs-137 source, though closer to the average energy than Sr-90 for specific samples, is not recommended for the same reason as Sr-90/Y-90. With an average beta energy on site of approximately 120 keV and the predominant isotope being analyzed being Co-60, with a beta max energy of 310 keV, a counter efficiency of approximately 25% is expected using Tc-99. Therefore a Tc-99 calibration is more accurate for estimating the gross beta activity.

Continued on page 6

Why Should I Join The Health Physics Society?

The Health Physics Society Membership Committee wants NRRPT Registrants to be aware that the application process to take advantage of Health Physics Society membership has recently been simplified and streamlined. You no longer have to identify sponsors as part of applying for HPS membership. This change was made with the NRRPT membership specifically in mind. Applying for membership is easy, and can be completed online at: https://hps.org/apply/joinhps.cfm.

As a Radiation Protection Technologist, you are personally and professionally interested in occupational and environmental radiation protection in particular and minimizing risk from radiation exposure relative to the derived benefits in general. You share these interests with nearly 5,000 other members of a respected international professional organization, the Health Physics Society. In recognition of the value of your insights and perspectives in applied health physics and radiation protection, your NRRPT credential qualifies you for plenary membership in the Health Physics Society. Your participation in Society activities and interaction with the members will provide opportunities to have a well-developed and highly productive career in radiological protection.

Tangible benefits of Society membership include:

- A subscription to the monthly Health Physics Journal.
- A subscription to the monthly Health Physics News, which is about to evolve into an e-newsletter.
- A subscription to the quarterly Operational Radiation Safety.
- Complimentary copies of the ANSI/HPS standards, downloadable from the Members Only section of the HPS website.
- A listing in and access to our Online Membership Directory.
- Access to the Members Only area of the Health Physics Society website, which contains News, Employment Information, a Legislative Action Center, and Online access to full text of the Health Physics Journal, Health Physics News, and Operational Radiation Safety. The TOOLBOX area of this same website is an organized internet link to an array of practical resources to assist in radiation protection problem solving, calculations, and impact assessment.
- Reduced registration fees at meetings of the Society.
- Reduced fees to join Sections of the Society.
- Opportunities to participate on Society committees, vote and hold office.

As an NRRPT member, you are probably already well aware of the Health Physics Society. If you are already an HPS member – thank you. However, you may have made a conscious decision not to get involved, or just never thought much about it.

Please think about it; Here are some Q&A's that might help your thought process:

I am a technician and don't have access to my company's travel budget. And they are not going to pay my professional society membership dues. The research articles published in the HPS Journal have little relevance to what I do day-to-day as a radiation safety specialist. How is HPS membership of value to me?

> The editors of the HPS have added the Operational Topics heading to the HEALTH PHYSICS Journal as well as offering a quarterly periodical Operational Radiation Safety to further encourage publication of applied radiation safety articles. We encourage members to submit papers to share ideas, solutions, and good practices.
>
> Perhaps the greatest value of the Health Physics Society is for networking. Learning from others experiences and finding opportunities. Whether you are seeking future employment, recruiting outage assistance, or wanting to identify potential project collaborators, the HPS provides the mechanism to connect with fellow professionals.

I work in commercial nuclear power. We constantly focus on improvements to our radiation safety programs. How is HPS membership of value to me?

> The HPS has had a longstanding relationship with commercial nuclear power. Membership in the HPS gives you directory contact information for other HP's in commercial nuclear power and provides excellent opportunities for professional growth. The TOOLBOX section of the HPS webpage may facilitate your plant's adoption of a radiation protection solution that another nuclear power organization already developed.

The nuclear facility where I work — like most such facilities — is located some distance from the closest city. The nearest HPS chapter where I could get involved and contribute is too far away to routinely attend chapter meetings. So why is HPS membership of value to me?

> The HPS has become internet savvy and web-centric! Check us out at hps.org . Most of our committee work is done via phone bridges, web meetings, Skype, and email. HPS has experimented with establishing a "virtual chapter" and will continue to assess how available technologies can help overcome isolation realities. By getting involved with the Society, you meet great people, develop career contacts, and connect with the worldwide HP community.

Clearly a professional society is obligated to provide some utility to its member professionals; You are entitled to ask: What is in the Health Physics Society for me? Please accept this gentle encouragement: If YOU are a part of the Health Physics Society, that is one more contact, one more accumulation of unique experience, and as such, your involvement increases the HPS membership value for all of us in the profession.

Continued from page 4

Additionally, it is recommended that a specific calibration be performed using Sr-90/Y-90 for the purpose of counting water samples, per EPA Method 900.0, as well as being used for QA and cross check sources. The Tennelec instrument is capable of storing multiple calibrations for individual counting needs.

References

BNL. Brookhaven National Laboratory National Nuclear Data Center Chart of the Nuclides, http://www.nndc.bnl.gov/chart/reZoom.jsp?newZoom=7 ; Accessed 09/06/2011.

Acknowledgements

Many thanks to Dr. Mike Nichols, CHP for performing the independent review of the original white paper and the GEL Laboratories for performing the 10CFR61 analysis for this study.

Dr. George J. Vargo, Jr. Memorial

Dr. George J. Vargo, Jr., PhD, age 55, of Avondale, PA, died Sunday November 20, 2011 at his home. He was the husband of Susan E. Renner Vargo.

Born in Pittsburgh, PA, he was the son of the late George J. and the late Lois (Samer) Vargo Sr.

George was a Certified Health Physicist for the Dept. Of Environmental Protection, State Of PA. George developed an interest in health physics during his high school days while working on a science fair project. After graduating from Duquesne with a B.S. degree in radiological health, George joined the staff of Radiation Service Organization in Laurel, Maryland, in 1978 as the Radiation Safety Officer. In 1979, he joined the staff at Fitzpatrick Power plant in New York. He moved on to the Pacific Northwest National Laboratories in 1991. Along the way, George completed a Master of Science degree in Health Physics from Georgia Institute of Technology and a Ph.D. in applied physics from Columbia Pacific University. George joined MJW corporation in 2002 and the PA Dept. of Environmental Protection in 2009.

He was the recipient of the William A. McAdams Outstanding Service Award, has been selected as an official delegate to the IRPA Congresses in Montreal, Vienna, and Hiroshima, was awarded the title of Fellow of the Society for Radiological Protection in 1998, Fellow of the Institute of Physics in 2000, and Fellow of the Health Physics Society in 2008. George was certified by the American Board of Health Physics in comprehensive practice in 1984 and in the power reactor specialty in 1986. George developed a passive directional radiation probe using an array of TLDs. In 1992, he was granted a United States patent for this invention.

He was formerly an Associate Editor and Software Editor for the Health Physics Journal and has written numerous book reviews. . George managed the Chernobyl Dose Reduction Project, whose goal was to transfer and upgrade health physics technology at the Chernobyl Shelter and edited a book on the Chernobyl accident. Somehow, in addition to this impressive list of professional activities, George found time to engage in such hobbies as photography, amateur radio (CCAR), and Skywarn.

Survivors include in addition to his wife Susan, one step daughter, Catherine “Katy” O’Toole of Avondale, PA; one brother, Charles Vargo of Pittsburgh, PA and one sister, Claire Vargo of Pittsburgh, PA.

A Memorial Mass was held at 10AM on Thursday, December 1, 2011, at St. Gabriel Of The Sorrowful Mother Church, 8910 Gap Newport Pike (Route 41), Avondale, PA

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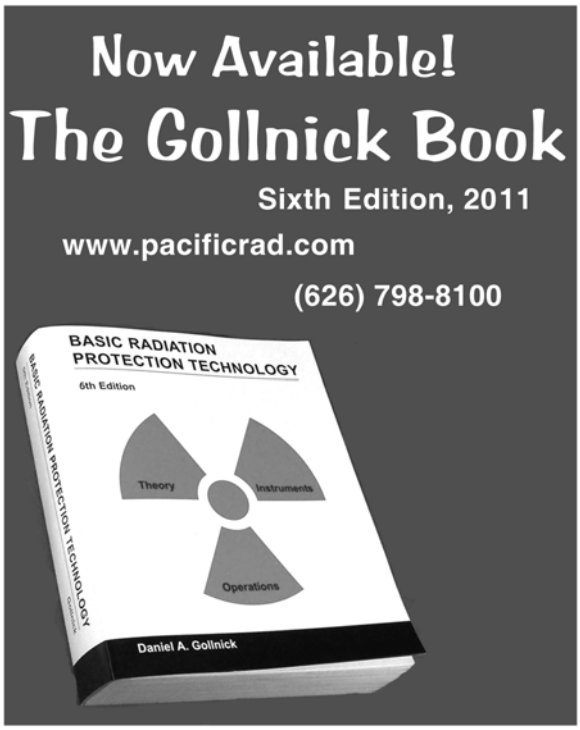

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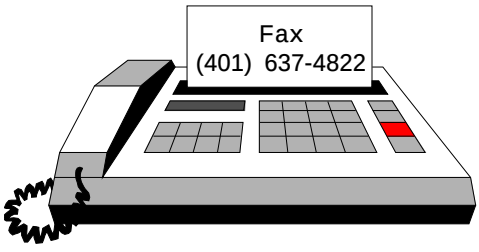

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