The NRRPT NEWS

OFFICIAL NEWSLETTER of the *National Registry of Radiation Protection Technologists*

June 2016 | 40th Anniversary Edition | Incorporated April 12, 1976

Chairman's Message

Greetings fellow RRPTs !

I am excited and gratified to be a part of the NRRPT as we celebrate its 40th anniversary. From the humble beginning in 1976, the Registry has grown to become an international organization. And it is all due to you, the current and former members. I wish to thank everyone that has supported me and the Registry over the last three years that I have had the opportunity to lead this great organization. It is with some sadness that I will be leading my last Board of Director's meeting in Spokane, WA in July. But I know that the NRRPT is in good hands with our new Chairman, Dave Tucker, who will be leading this organization as it surpasses the 40 year mark and into a very bright and exciting future. As Don Marshall, one of the NRRPT founders and visionaries, has stated, "I never envisioned this organization would have grown to its current capacity and promoted the science of Radiation Protection in this manner." I myself am amazed at the progress the Registry has made since my involvement in 1999 and feel that all Radiation Protection technologists have had a hand in promoting the science that we take for granted on a daily basis.

As you are all aware, the nuclear industry has seen some significant changes that are beginning to affect the livelihood of utilities that have made decisions to close plants that are no longer competitive in the ever changing energy sector. The cost of natural gas, changes in the regulated energy market, and customers seeking to have an energy alternative that is not only efficient but friendly to the environment has hastened this change. I will always stand on the pillar that nuclear power should be recognized as a "Green Power" source with its reduced carbon footprint and the fact that it operates at nighttime and even when the wind doesn't blow. Please take the time and join me in writing, calling, or e-mailing your state and federal representatives to let them know that you are a firm believer in the future of nuclear power and making nuclear a viable option to power the future of America.

While there are plant closures looming on the horizon, there are also new plants rising from the southern soil to begin the nuclear renaissance. In addition, a number of utilities still have Combined Operating Licenses under the review and approval process by the Nuclear Regulatory Commission. There is even an application in process for an early site permit for two or more small modular reactors at the Tennessee Valley Authority Clinch River site. These actions are evidence that nuclear power is still a viable power option and we as radiation protection professionals should promote

Inside This Issue

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its safety and efficiency when interfacing with others and whenever the subject arises.

Finally, take the time to mentor the upcoming professional radiation protection personnel in your field and encourage them to take the next step in their professional development by studying and applying to take the Registry exam. The Panel of Examiners (made up of RPTs just like you) have worked hard on producing an excellent exam product and we are beginning to glean the fruits of their labors. Successful completion of the exam can be used as a stepping stone to increased pay, professional advancement, and the personal satisfaction in knowing that you have joined 5500 others that have successfully added the Registered Radiation Protection Technologist (RRPT) title to their credentials.

The next Board and Panel meetings will be held in conjunction with the Health Physics Society Annual meeting July 15 – July 19 in Spokane, Washington. This will be a very special meeting since it will be the 40th Anniversary since the inception of the Registry. Please remember that all members of the Registry are welcome at these meetings and encouraged to participate on the Panel of Examiners "Angoff" sessions. We hope to see you there!

Respectfully,

Eddie Benfield

NRRPT, Chairman of the Board

NRC Issues Final Supplement to Yucca Mountain Environmental Impact Statement

(Information used in this article was taken from an NRC publication - NMSS Scoop Spring- Summer 2016 Edition)

The Nuclear Regulatory Commission (NRC) has published its final supplement to the environmental impact statement issued by the Department of Energy (DOE) for a proposed permanent repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain in Nevada. The results of the supplement, in which potential impacts on groundwater and surface groundwater discharges were assessed, indicate that all impacts would be “small.”

The document supplements environmental impact statements (EIS) the DOE prepared on the proposed repository. DOE issued the final EIS in 2002 but then supplemented it in June 2008 when it submitted a construction authorization application to the NRC. Under the Nuclear Waste Policy Act, the NRC is to adopt DOE’s EIS to the extent practicable. The NRC staff recommended adoption of DOE’s EISs in September 2008, but noted the need to supplement the study of groundwater effects in the Yucca Mountain aquifer beyond DOE’s analyzed location at the site boundary. DOE ultimately deferred to the NRC to prepare the supplement.

The NRC published a draft of the supplement for public comment in August 2015. During the 91-day public comment period, NRC staff conducted public meetings to present the report and receive comments in Rockville, MD; Las Vegas, NV; and Amargosa Valley, NV. The NRC received more than 1200 written and oral comments on the draft supplement. The NRC staff’s responses to these comments, and descriptions of changes made to the final report in response to comments, are in Appendix B of the supplement which is available on the NRC website at: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2184/

National Registry of Radiation Protection Technologists – 40 Years and Counting

By Ed Lohr, RRPT

As the NRRPT celebrates its fortieth year it is good to look back at its humble beginnings. The NRRPT was established in 1976 through the sponsorship of the Health Physics Society (HPS) and the American Board of Health Physics (ABHP). The Registry was founded to encourage and promote the education and training of Radiation Protection Technologists and, by doing so, promote and advance the science of Health Physics. For the last 40 years the Registry has been following its charter by actively registering individuals that practice in the radiation protection arena.

The first NRRPT Board. Individuals Pictured (left to right): Claude Hooker, Phil Gianutsos, Ron Schrotke, Dick Weetman, Ace Butler, Leon Rothman, Don Marshall, Bama McKnight, Norm Sunderland, Don Orrock, and Paul Harvey. Circa 1975.

The first meeting of the NRRPT Board of Directors was held on November 20, 1975 and the Registry was incorporated in 1976. During the year before the first exam was given, a Panel of Examiners was established to develop an examination and a preparation guide. A massive effort took place over the next year to get a 150 question exam ready for its first use on November 13, 1976. All past and current RRPTs owe a debt of gratitude to these pioneering trailblazers for establishing a means in which radiation protection technicians could demonstrate their broad knowledge of health physics through a national certification process.

The first NRRPT Panel of Examiners. Individuals Pictured (left to right): Norm Sunderland, Don Marshall, Ace Butler, Phil Gianutsos, Leon Rothman, Paul Harvey, Don Orrock, Ron Schrotke, Dick Weetman, Bama McKnight, Unknown, and Claude Hooker. Circa 1975.

Individuals who have passed the Registry exam have demonstrated that they have a basic understanding of the natural laws of ionizing radiation, the mechanism of radiation damage, methods of detection, and hazards assessment. These registered individuals provide supervisory, administrative, and/or physical control for hazards associated with radioactive material and ionizing radiation producing devices, utilizing sound health physics principles in compliance with local and statutory requirements and accepted industry practices.

Since its inception, the NRRPT has registered more than 5,300 technologists throughout the country from many industry facilities and each year more and more interest is expressed. Due to this interest, training programs and preparation materials are being continuously upgraded to accommodate candidates, and as a result, the level of competence is being raised nationwide within the industry. The increased presence of radiation protection technologists in the Health Physics community is adding to the credibility of competent radiation protection, which is in demand by both regulatory agencies and the general public. Some companies specifically require registration for hiring, promotions, and salary grade increases. Many commercial power plant contractors' pre-employment screening exams have been waived for NRRPT Registered individuals. The Institute for Nuclear Power Operations and the Department of Energy both recommend that nuclear facilities encourage their personnel to seek NRRPT Registration.

In keeping with the NRRPTs objective to encourage and promote the education and training of radiation protection technologists, the Registry provides incentives and services to promote and advance the science of health physics. Through its many scholarship programs, the NRRPT has encouraged individuals to seek degrees in the radiation

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Obtaining a Radiation Protection Degree

Hello **NRRPT** Registered Members,

Wanted to pass this information on; if you haven't already done so it would be good to share with your non-degreed RRPTs of the great opportunities and support for obtaining a Radiation Protection degree.

Through Thomas Edison State University (TESU):

- the NRC offers Scholarships in Nuclear Engineering and Radiation Protection. http://www.tesu.edu/tuition/nrc-scholarship.cfm
- the following programs have been assessed by TESU for course equivalencies: **Navy Nuke** (up to **87** credits); **NRC Generic Fundamentals** Exam (up to **10** credits); **Nuclear Utility Training** Through INPO's National Academy for Nuclear Training (up to **60** credits), the INPO credits includes all training, not just RP. http://www.tesu.edu/academics/cal/apr.cfm#nrc

The combination of the **NRRPT** credits combined with the opportunities above should be able to get you to a BS pretty quickly.

If you'd like to join the Panel of Examiners please contact one of the following:

Exam Panel Chairman—Dave Wirkus—David.Wirkus@amwtp.inl.gov

Executive Secretary—DeeDee McNeill DeGrooth—nrrpt@nrrpt.org

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protection field. Additionally, passing the NRRPT exam results in an individual being able to claim ACE college level credits awarded towards a degree. Over the years, scores of students have benefited from the Registry's support.

The NRRPT became an international registry in 2006 with the addition of its Canadian version of the exam. The Registry's logo was modified in 2010 to reflect the Canadian affiliation shortly thereafter. Further, a member from Canada is on the NRRPT Board of Directors. Currently, the NRRPT is developing an exam for use in South Africa and other countries that have expressed interest. The logo may have to be modified again soon!

From its humble beginnings in 1975 to now, the NRRPT has grown and evolved into an internationally recognized organization for radiation technologists. With the strong support of its financial sponsors, both past and present, and its membership, the NRRPT will continue to be a professional organization for radiation technologists for generations to come. To learn more about the NRRPT, visit the official website at NRRPT.org.

Towards the Launch of the NRRPT International Exam

By Dave Tucker

For the past three years, the Board and Panel have been working towards the exciting goal of launching a new international version of the NRRPT exam. Here's a few words about how this came about, where we are in the process and what is ahead of us.

In 2012, the NRRPT Board was informed of interest from the South African radiation protection community to extend the examination and registration process to that country. Discussing this with industry contacts, it became clear that there was potential interest in several countries, including the United Arab Emirates which has been embarking on a new nuclear power build program. The concept of expanding the Registry beyond the United States and Canada was also discussed informally with international attendees at an IAEA radiation protection workshop in 2013 and there appeared to be a great deal of interest.

The Board discussed an approach to this interest and decided to pursue the launch of an international version of the exam. The International Exam Committee was established by the Chairman in 2013 and tasked with preparing and launching an international version of the exam. Recognizing that the logistics of maintaining expert knowledge of the radiation safety regulations and practices of several different countries, with some operating in other languages, could be overwhelming, the Board determined that we would pursue a new "international" version, rather than country specific exams. The basis of international exams for regulatory based questions would be the IAEA Regulations. In addition, it was determined that the exams themselves would be limited to offerings in English. The strategy of having one international version of the exam also addressed the anticipated problem of small candidate pools in many counties.

With these marching orders, the International Exam Committee set out to establish an action plan and make the international exam dream come true. Examining the experience from the launch of the Canadian version of the exam in 2006, we identified the following key steps to the approach:

- Establish a trusted partner in each country. The trusted partner would promote the exam in their country, provide local expertise link to the countries RP community, would proctor exams and would help in building and evaluating the question bank. For the launch in Canada, this partner was McMaster University.
- Revise the question bank, maintain as much consistency as possible with the existing exam bank. The task is to replace questions that are based on US regulations with questions based on IAEA regulations. In addition, questions need to be revised to ICRP 60 dose quantities and units from ICRP 26 values and some terminology has to be addressed. Overall, we knew from the Canadian exam experience that about 30% of the questions in the bank would require revision.
- Identify a local candidate pool. Communicate with them, promote the exam and review applicants. This can be challenging as local terminology for education and jobs can be difficult to interpret against the established requirements of the NRRPT. Help from the trusted partner will be required here!

We identified South Africa as the first country to launch the exam in and initially had set a goal of launching at the 2016 May International Radiation Protection Association Congress this past May. However, it became clear that there was simply too much on the go with the IRPA meeting to focus on this appropriately and that the exam development was moving a little slower than hoped. We are now targeting 2017 for the launch in South Africa.

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U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC NEWS
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No: 16-039 July 1, 2016
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NRC Revises Regulations to Increase Potential Maximum Fine

The Nuclear Regulatory Commission, following changes in federal law, has revised its regulations to increase the potential maximum civil penalty for violations of the Atomic Energy Act from $140,000 to $280,000.

The agency is increasing the maximum civil penalty to meet the requirements of the Federal Civil Penalties Inflation Adjustment Act of 2015. The law calls for an initial "catch-up" penalty adjustment to become effective no later than Aug. 1. The NRC will also follow the law's requirement to annually adjust penalties for inflation, beginning in January 2017.

The NRC may assess penalties up to the new maximum in all cases assessed after Aug. 1, even if the violation occurred before that time. The NRC will soon publish conforming changes to the agency's enforcement policy, which includes the process for assessing civil penalties based on the violation's severity and the type of licensee.

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Question drafting is nearing completion thanks to hard work of the Panel at the past two meetings. Our remaining tasks are to "Angoff" the international questions with members of the exam panel and representatives of the South African radiation protection community and to promote the exam and establish a candidate pool.

Following the launch in South Africa, we will evaluate and adapt as required. Anticipating a successful launch, the Board will then consider expansion to additional interested countries in subsequent years. Hopefully, it won't be long until the benefits of NRRPT registration are enjoyed by the radiation protection communities around the world!

Dave Tucker
International Exam Committee Chair
Vice Chair, NRRPT Board of Directors

The current members of the International Exam Committee are:

Karen Barcal	Danny McClung	Dave Tucker (Chair)
Dave Biela	Rick Rasmussen	
Todd Davidson	Kelly Neal	

For additional information on the term "Angoff," please view the excellent video presentation by Dave Biela found on the NRRPT website

Our trusted partner in South Africa is Dr. James Larkin at the University of Witwatersrand in Johannesburg in South Africa.

Editors' Note: The NRRPT Board and Panel jokingly call the effort to create an International Examination the "Global Domination Committee." However, we are very excited about the opportunity to become global authorities for radiation protection and to establish an international mark of mastery for radiation protection technologists. This very large effort could not have taken place without the great work by Dave Tucker. He is dogged, relentless, and an overall great guy.

Testing, testing…

By Todd Davidson

The problem presented from the last time is listed again, along with the solution.

Given: *A neutron is traveling at a speed of 7.9E+5 furlong/fortnight. Can this neutron be considered to be a thermal neutron? Hint: A thermal neutron can generally be considered to be travelling at a speed of 2.2 km/s.*

Solution: *This is a straightforward use of the train-track method, noting that a furlong is 220 yards (1/8th of a mile) and that a fortnight is 14 days.*

$$\frac{7.9E+5\ \text{furlong}}{1\ \text{fortnight}} \times \frac{0.125\ \text{mi}}{1\ \text{furlong}} \times \frac{5280\ \text{ft}}{1\ \text{mi}} \times \frac{0.304\ \text{m}}{1\ \text{ft}} \times \frac{1\ \text{km}}{1000\ \text{m}} \times \frac{1\ \text{fortnight}}{14\ \text{day}} \times \frac{1\ \text{day}}{24\ \text{h}} \times \frac{1\ \text{h}}{60\ \text{Min}} \times \frac{1\ \text{min}}{60\ \text{s}} = 1.3E\text{-}01\ \frac{\text{km}}{\text{s}}$$

Compare the calculation with 2.2 km/s to note that the described neutron cannot be considered to be a thermal neutron. It is slower than a thermal neutron.

Now we move on to Train-tracks 1.02. The discussion will focus on a few features that are useful when dealing with unit conversion.

- When using the train-track method, it is better to have a good calculator than a good memory. For example, most people do not memorize how many cubic feet there are in one cubic meter. But by knowing how to raise a number to an exponent of three, the fact isn't necessary. The fact that 1 foot = 30.48 cm = 0.3048 m is enough to perform that calculation.
- When doing simple unit conversion, the units of "disintegrations per minute" or "counts per second" are often expressed as "dpm" or "cps" respectively. Note that this is generally acceptable simply because the conversion factors that you may use to for such units are expressed similarly. However, it may be more useful to express these units as "dis/min" or "cnt/s" respectively. Whichever way the units are expressed, it is useful to stay consistent in expressing them the same way within that problem.
- Very rarely there are problems with expressing activity units as "cnt/s" or "dis/min" because there is a squaring or square-rooting operation that must be performed on the unit(s). In cases like these the "count" or the "disintegration" event might not be able to be considered to be a unit and therefore will NOT be squared or square-rooted. This is sometimes taken care of by the form of the equation, but sometimes is not. Problems such as these generally occur when calculating uncertainty or detection limits for a counting operation. Be cautious with these calculations.

- Conversions from “dpm” to “dps” and “cps” to “cpm” and their opposites should be straightforward and automatic for most of us experts in radiation protection. However, the familiarity that we have with those calculations sometimes means that we develop a cavalier attitude. The author has lost count of how many times that writing out the train-tracks for problems with those simple conversions have produced a more reasonable and accurate result than the quick calculations that were performed using only his (obviously confused) brain. Remember, 1 cps = 60 cpm!. That conversion factor is an excellent place to express the units as “cnt/s” or “cnt/min.”

To work on some of the features listed above, please perform the following problem.

Given: *You have counted an air sample for 20 minutes on a smear counter. The efficiency of the instrument is 0.313 counts/disintegration for the alpha channel. The sample was counted on a high volume air sampler that ran for 20 minutes at a rate of 2.5 cubic feet per minute. The amount of alpha counts on the air filter were 18. Express the air concentration in mCi/ml, assuming that the sample collection efficiency is 100% and that the self- absorption factor for alpha is 1.0. Also, convert this into Bq/m^3.*

While you’re waiting for the next installment of this feature, feel free to contact me with types of problems you’d like to see, or with any comments on the problems and solutions. You may contact me by any of the following email addresses.

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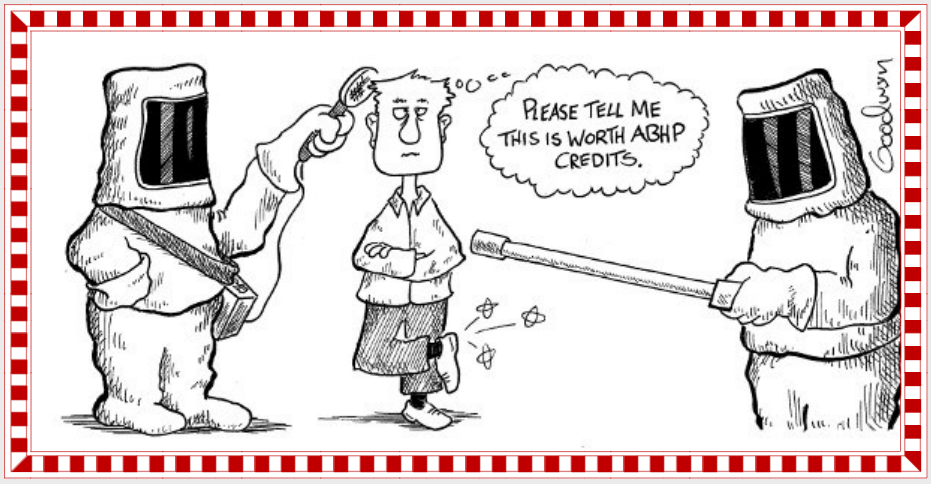
todd.davidson@lm.doe.gov



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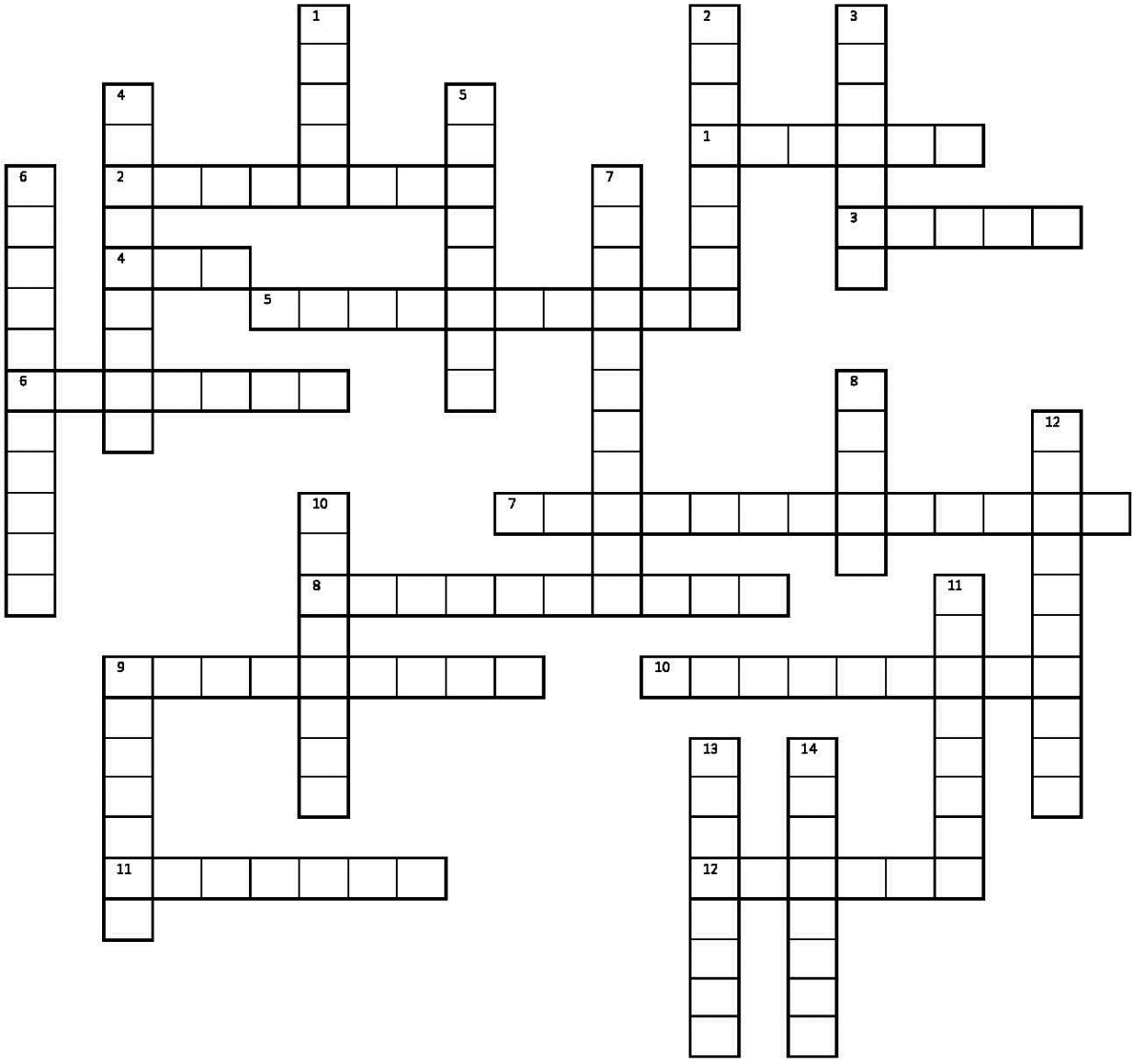
Rad Crossword Puzzle

Solution on Page 19



Thank you Don Krause for the **NRRPT** Rad Crossword Puzzle!!

Rad Crossword Puzzle

Across

1 Iodine-131 is a radionuclide most suited to _____ bioassay measurements?
2 A nuclear reactor core immersed in a pool of water shows a blue glow that is known as _____ radiation.
3 Krypton and Argon are examples of _____ gases.
4 An acute exposure in excess of 2000 rads will cause _____ syndrome.
5 The International _____ on Radiological Protection (ICRP) is an independent, international, non-governmental organization.
6 Urine sampling is the preferred method of _____ bioassay.
7 Smear survey counting for low-energy beta emitters is usually conducted using liquid _____ techniques.
8 Air sampling techniques are based on passing a known volume of air through a filter medium of known _____.
9 One purpose of air sampling is the quantification of activity level of various radionuclides in the _____ zone of workers.
10 Mixed waste contains both radioactive and _____ waste components.
11 The radioactive decay series that includes Ra-226 as one of its decay products is _____.
12 The NRC regulations for the standards for protection against radiation are published in Title Ten CFR Part _____.

Down

1 _____ is an element with a high thermal neutron cross section and is used in neutron counters.
2 _____ emission occurs in strongly neutron-deficient nuclides where the daughter product will be an isobar of the parent.
3 Air purifying respirators use _____ air and provide no protection for radioactive vapors and gases.
4 2.22 dpm is the disintegration rate in a _____ of any radioactive substance.
5 Body cells most susceptible to damage by radiation are those found in rapidly _____ tissues.
6 A GM detector has a high _____, because the entire gas volume of the detector is ionized when an ionization event occurs.
7 Effective half-life considers two factors, the biological elimination rate and the in situ _____ decay of the radionuclide.
8 An electron volt, erg, and _____ are all units of energy.
9 In broad beam or thick shield shielding calculations, _____ factor must be considered.
10 An exposure which deposits 87.7 erg/g in air equals one _____.
11 In vitro _____ measures the radioactivity being eliminated from the body.
12 Genetic effects and cancer are types of _____ radiation effects.
13 External radiation exposure control used one or more of three techniques; time, _____, and shielding.
14 Immersion in a cloud of radioactive gas has two basic exposure pathways, internal and _____.

NRRPT Annual Meeting

The 2016 **NRRPT** Board and Panel annual meetings will be in conjunction with the HPS Annual meeting in Spokane, WA. The **NRRPT** Board meeting is Saturday, July 16 and Tuesday, July 19. The **NRRPT** Panel meeting is Sunday July 17 and Monday July 18. All **NRRPT** members are welcome to attend!

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

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SCE is committed to a safe and timely decommissioning of the San Onofre nuclear plant that protects the environment and our customers' economic interests. SCE established a set of guiding principles focused on safety, stewardship and engagement that will guide the successful decommissioning of SONGS and can make San Onofre a model for the industry.

SONGS is proud of its' continued dedication of registered RRPT members that are represented in various organizations across the station.

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The new Duke Energy, which is the product of a merger with Progress Energy, is the largest electric power holding company in the United States with more than $100 billion in total assets. Its regulated utility operations serve more than 7 million electric customers located in six states in the Southeast and Midwest. Its commercial power and international business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States. Headquartered in Charlotte, N.C., Duke Energy is a Fortune 250 company traded on the New York Stock Exchange under the symbol DUK.

171 Grayson Rd.
Rock Hill, SC 29732
(803) 366-5131
frhamsc@frhamsafety.com

318 Hill Ave.
Nashville, TN. 37210
(615) 254-0841
frhamtn@frhamsafety.com

Incorporated in 1983, Frham Safety Products, Inc. continues its sole purpose of manufacturing and distributing products to the Nuclear Power Utilities, DOE, DOD, Naval facilities as well as several industrial accounts and related users of safety supplies and equipment.

From the creators of proven products such as the Totes Overshoe and the Frham Tex II, Frham continues their objective to provide products and services which meet or exceed the specifications set forth by customers and the industries that it serves. These revolutionary new concepts include Life Cycle Cost Management (LCCM), Mobile Outage System Trailer (MOST) and Certified Disposable Products (CDP).

- LCCM offers products through a systematic approach of life cycle pricing to include disposal at the purchase point.
- MOST provides onsite product storage stocked systematically specified by the customer for easy access and stringent inventory control.
- CDP consists of proven disposables for every application which includes standard and custom specifications to meet your disposable needs.

Among these services and products, Frham also supplies chemical, biological and radiological equipment which will support applications for domestic, biological, nuclear, radiological or high explosive incident sites. This equipment is able to sample, detect and identify chemical warfare agents and radiological materials as well as provide safe-barrier, personal protection from chemical warfare, biological warfare, radiological and TIC/TIM environments.

F&J Specialty Products, Inc.

Frank M. Gavila
404 Cypress Road
Ocala, FL 34472
352.680.1177/352.680.1454 (fax)/fandjspeciaty.com

ISO 9001:2008 certified manufacturer of traditional and advanced-technology air sampling instruments, airflow calibrators, filter holders, consumables and accessories.
Air Sampler product lines include; high and low volume, tritium, C-14 and battery-powered air sampling systems. Various models are available for both portable and environmental sampling systems. Consumable product line includes; filter paper, TEDA impregnated charcoal cartridges and silver zeolite cartridges. F&J provides comprehensive collection efficiency data for radioiodine collection cartridges. F&J manufactures the premier line of small lightweight emergency response air samplers which can operate from line power, on-board batteries or an external DC power source. Battery powered units have on-board charging systems.

General Engineering Laboratories, LLC

Bob Wills
2040 Savage Road
Charleston, SC 29407
(843) 906-5929
(843)766-1178 (fax)
robert.wills@gel.com
www.gel.com

GEL provides the nuclear industry with radiochemistry, bioassay and analytical chemistry support. GEL is a provider of 10CFR61, REMP and hazardous waste characterization to commercial nuclear reactor sites, DOE sites and DOD facilities throughout the US. For information regarding analytical services please contact Bob Wills.

HI-Q ENVIRONMENTAL PRODUCTS COMPANY, INC.

Air Sampling & Radiation Monitoring Equipment, Systems & Accessories

HI-Q Environmental Products Company is an ISO 9001:2008 certified designer/manufacturer that has been providing air sampling equipment, systems and services to the nuclear and environmental monitoring industries since 1973. Our product line ranges from complete stack sampling systems to complex ambient air sampling stations. HI-Q's customers include the National Laboratories and numerous Federal and State Agencies in addition to our domestic and international commercial customer base. Our product catalog includes: Continuous duty high & low volume air samplers, radiation measurement instrumentation, radiation monitoring systems, air flow calibrators, radioiodine sampling cartridges, collection filter paper and both paper-only or combination style filter holders. Along with the ability to design complete, turn-key, stack and fume hood sampling systems, HI-Q has the capability to test ducts and vent stacks as required by ANSI N13.1-1999/2011.

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Master-Lee is a leading supplier of refueling, maintenance, inspection, operations and outage management services for PWR Nuclear Power Plants in the U.S. Market and has supported the major NSSS companies in the performance of similar tasks at BWR sites. Master-Lee also designs, fabricates and supplies specialty products, tools and parts in support of our various product lines. These capabilities are provided by our broad range of Product Lines: Refueling and Related Services; Pump and Motor Services; NDE – Eddy Current Testing Services; Specialized Reactor Services; Decontamination Services; Decommissioning Services; Engineered Products; and Technical Services.

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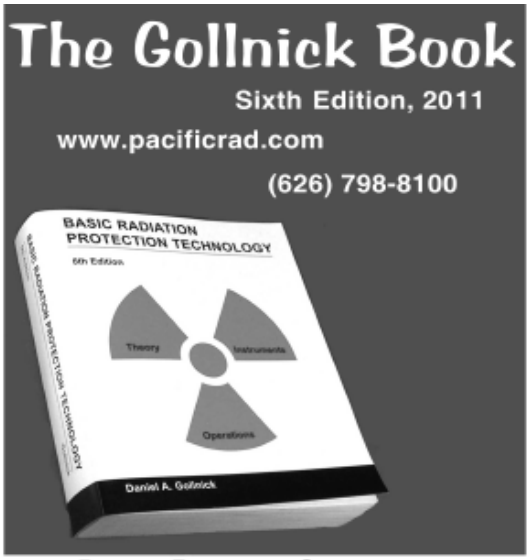

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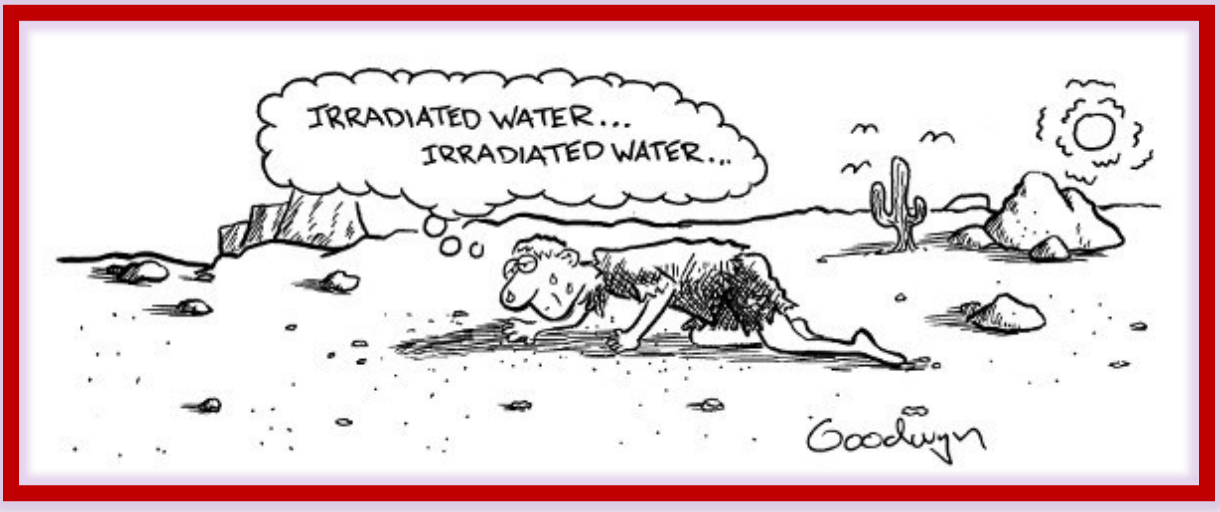
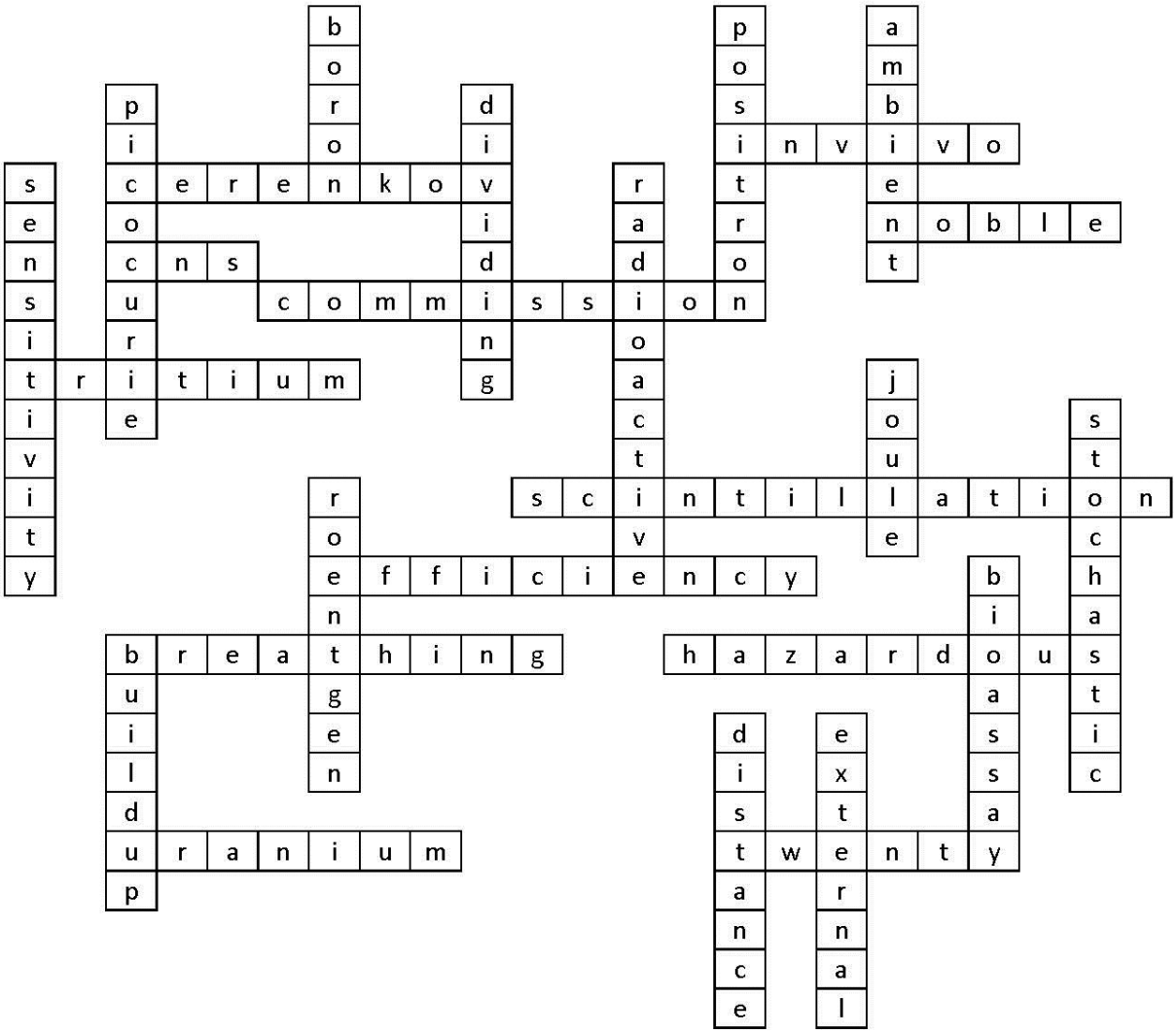
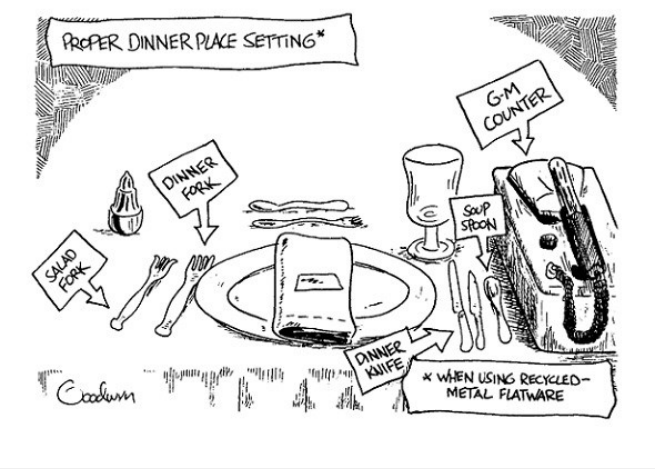


Rad Crossword Puzzle

Solution



Happy 40th Anniversary to NRRPT



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