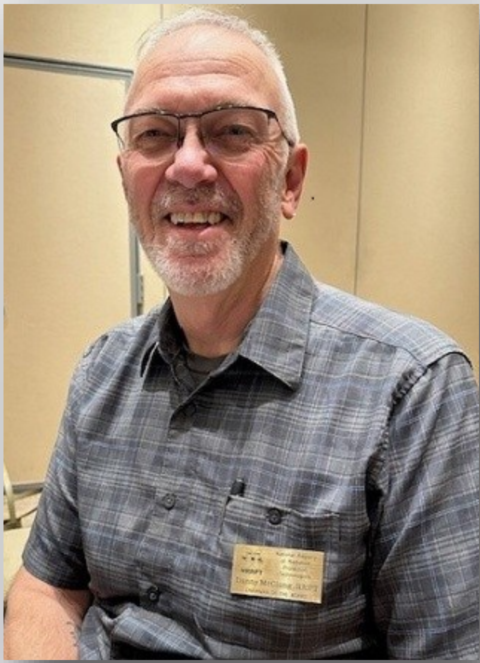
The NRRPT NEWS

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

March 2025 Incorporated April 12, 1976

Chairman's Message



Chairman Danny McClung

Greetings fellow RRPTs!

4 more weeks of winter?

Fellow RRPTs; welcome to the late winter edition of the NRRPT newsletter. I know that many of you are tired of winter, but as you know, you can blame that darn groundhog! Here in Florida, the pollen is already showing up on my truck as we are a good six weeks ahead of the middle tier of the US and even farther ahead, seasonally than our friends north of the border.

Speaking of north of the border, let's welcome the 4 new RRPTs who passed the recent November 2024 Canadian exam! The February 2025 exam (US) was just held on the 22nd. I wish all who sat for the exam good fortune with your results. We do know, through numerous years of feedback, that those who study hard can pass the exam on the first attempt!

I want to tell you that it is my honor to have been re-elected NRRPT Chairman by the Board of Directors at the summer meeting last year. It truly is a joy to serve the membership of our organization and work with the many talented RRPTs who attend the Board and Exam Panel meetings. The next meeting of the Board and Panel will be in conjunction with the Health Physics Society in Madison, Wisconsin from July 12th through 15th. We hope to see many of you there as this is your organization. We need your participation to keep the NRRPT great! We had a productive meeting in Key West, FL a few weeks ago. As always, pictures of us working and having fun are included in this edition.

Inside This Issue

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Also featured in this edition are articles about Karla Rendell, your NRRPT Secretary-Treasurer, and Diana Baker, member of the Board of Directors (and Canadian RRPT extraordinaire). Thanks to these outstanding professionals for their continued service to the Registry!

This year we are preparing for the triennial credit review by the American Council on Education (ACE). This review evaluates our examination process for those all-so-important ACE credit recommendations that many of us have applied toward higher educational pursuits. Our efforts will be led this year by Dannie Green, who is the past Secretary-Treasurer for the Registry. He will do a great job for us!

We hope that this newsletter is both informative and fun for you to read. Kudos to our Newsletter Editor, Michelle Kovach, for cracking the whip to get this issue out for your enjoyment.

I will close with this update to the Chairman's agenda as discussed in previous newsletters.

1. Go live with the online NRRPT exam. We have 3 US exams securely loaded with the vendor. Last weekend was a test of the process. Hopefully, we will soon report that these efforts are completed.

2. Re-start work on an international exam. We have found definite interest in the UAE for our exam. At the last meeting, the International Exam Committee was re-energized for continued work in this area. We have made considerable progress on the exam bank already. More to follow on this initiative soon.

3. Continue promoting radiation protection as a great opportunity for work. I continue to see more jobs in the private sector for health physicists, which also means more jobs for RPTs. With the advent of small modular reactors and fusion energy technology, there should be no shortage of work for RPTs in the future. We should all encourage bright and motivated young persons to pursue a career as an RPT, and further encourage them to become RRPTs when at that point in their careers. Please contact me with your ideas about the future of the NRRPT or to become a member of the exam panel.

Hope to see you all in Wisconsin this July!

Danny McClung, RRPT,
Chairman of the Board of Directors,
NRRPT

Ancillary Radiation Sources at Accelerators

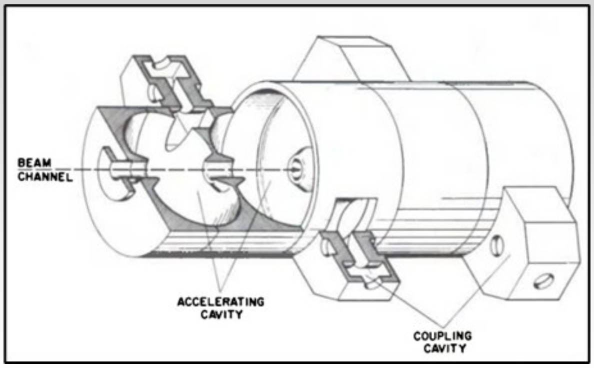
by Keith Welch

Greetings and welcome to another edition of the "particle article". This time we're going to take a look at some of the sources of radiation at accelerators *other than* the actual beam and its interactions. We tend to focus on the primary particle beam and its eventual interactions. But there are various ancillary radiation sources present at accelerator facilities, and some of these sources can be significant.

This article will focus on radiation produced by the components used to accelerate the beam. All accelerators convert energy from various electrostatic or electromagnetic fields into the kinetic energy of the beam. These fields are produced by components ranging from simple thermionic electron guns (operating on the same principle as x-ray tubes or CRTs) to high tech gadgets like superconducting radio-frequency (SRF) cavities. These components can sometimes create extremely high levels of radiation even when there is no actual particle beam operation. What such devices all have in common that makes them potential sources of radiation is that they produce high-potential (or "high-gradient") electric fields within an enclosure containing a vacuum. Any free ions (such as electrons emitted by a heated cathode or stripped from metal surfaces within the vacuum chamber) can be accelerated by the gradient. When these accelerated electrons encounter the vacuum chamber wall, they produce bremsstrahlung (x-ray) radiation, which may penetrate the walls of the chamber and become a source of radiation emitted from the device. For a thin-walled vacuum chamber, potentials above ≈10 kV may be capable of producing detectable low energy x-rays. In high gradient devices, things get more complicated.

Let's look at the process as it applies to components that might be found in a high-energy linear accelerator (Linac). The first thing you need for a particle beam is a particle source. The particles may be protons, electrons or heavy ions, but we're not interested in the particle beam itself. The hardware used to get the beam into the accelerator is generally called an "injector". Injectors can be very simple, low-energy devices or extremely complex assemblies that accelerate beams to hundreds of MeV. In electron machines, there will generally be a "gun" as the first step. Thermionic (heated cathode) guns have largely been replaced by photocathode devices. Photocathode guns have several advantages, including the production of polarized electron beams. Such guns focus a laser on a photocathode (much like the component in a photo-multiplier tube that converts light to electrons). The electrons emitted by the photocathode are then accelerated by a high-gradient electric field, becoming the beam proper. Electron guns, regardless of their design, can produce radiation even when no beam is being produced. When the high voltage is applied, very high local gradients may exist. Under these conditions, electrons can be removed from surfaces within the chamber (a process called "field emission", associated with microscopic imperfections in the metal surface) and accelerated by the field. This phenomenon is known as "dark current" and can create unsafe – and unpredictable - radiation levels in the vicinity of these components. Personnel access to areas housing such equipment is almost always prohibited when high voltage is applied to the hardware.

To reach energies higher than a few hundred keV, accelerators typically employ radiofrequency (RF) fields for acceleration of the beam. The components that apply this field are called RF resonating cavities, or just cavities. As the name implies, these cavities are designed to resonate at specific RF frequencies (normally in the microwave portion of the spectrum). The graphic below depicts the basic structure of a standing-wave RF cavity assembly.



From IAEA Technical Report 188, *Radiological Safety Aspects of the Operation of Electron Linear Accelerators*

Specially designed power supply systems provide the RF power to the cavities through waveguides (or cables in lower power applications). The oscillating RF field produces an electric field (gradient) inside the cavity aligned along the axis of the beam. It is this electric field gradient that accelerates the charged particles of the beam. These cavities come in many different types. But first let's look at the RF system.

Usually, RF power is provided to accelerating components by either klystrons or solid-state RF power amplifiers, depending on the particulars of the accelerator. Both devices act as amplifiers that provide highly stable output at high power. Normally, solid state amplifiers (SSAs) don't have ionizing radiation safety issues associated with them. But SSAs have limitations that often make klystrons the device of choice for many accelerators. At the heart of a klystron is a high-power vacuum tube containing an electron beam. And you guessed it, they produce x-rays as a normal byproduct of operation. Some klystrons can produce peak RF power levels of tens of megawatts or more, while typical average power is in the range of tens of kilowatts. Klystrons usually incorporate shielding in the design to reduce external radiation levels. But high-power units may still produce external radiation fields that exceed several mrem/h under normal conditions. Failure conditions such as cathode depletion or vacuum degradation may cause arcing, which can result in much higher levels. Klystrons are usually housed in auxiliary equipment buildings outside the main accelerator vault. These areas may need to be controlled due to the radiation production from the klystrons. The photo below shows the klystron gallery at the famous Stanford Linear Accelerator Center (SLAC) two-mile Linac.

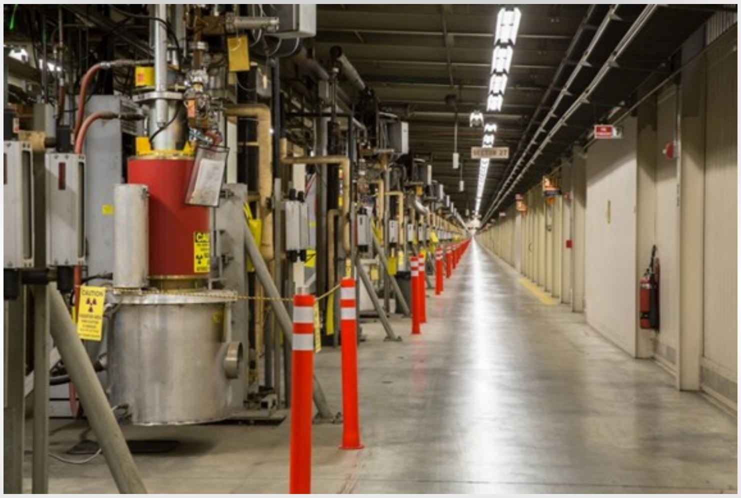


Image courtesy of SLAC National Accelerator Laboratory

Components like klystrons and RF cavities perform best when they are operated continuously. Therefore, RF power supplies are often kept on during periods when the beam itself is off. So, the radiation hazard from klystrons has to be considered independently from beam-related operations.

As mentioned earlier, RF power is supplied to cavities in the beamline proper that provide beam acceleration. Cavity design is diverse, but perhaps the biggest distinction in design is whether the cavities are normally conducting or superconducting. Normally conducting cavities are typically made of copper alloy, and are water cooled to remove heat produced by resistance in the metal. The RF power provided to the cavity must also be "pulsed" to prevent overheating. Pulse rates are typically in the range of 60-180 Hz. Many accelerators operate in this fashion, resulting in pulsed beams. The graphic shows a cutaway of a single-cell, normally conducting cavity that can provide about 180 kV of acceleration.

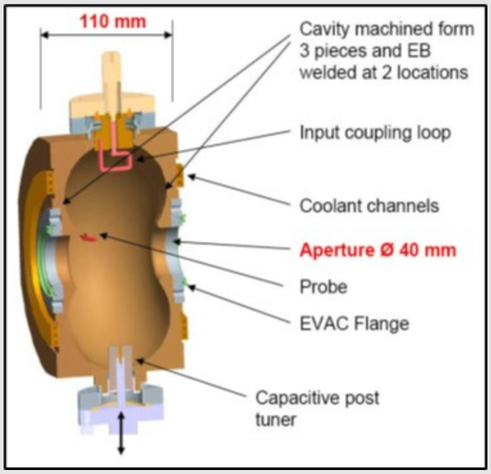


Image courtesy of Carl Beard, Paul Scherrer Institute

The advent of superconducting RF (SRF) technology has revolutionized accelerator design. The CEBAF machine at the Thomas Jefferson National Accelerator Facility (Jefferson Lab) was the first large-scale application of this technology. SRF cavities, typically made of niobium, are housed in liquid helium cryostats and operated at about 2 Kelvin, where they become superconducting. With essentially no resistance, SRF cavities can sustain gradients of over 20 MV/m – and the RF power need not be pulsed, but can run in a "continuous wave" (CW) mode. This facilitates much higher ultimate beam energy (over 6 TeV per beam in the LHC), and higher "brightness" (current); some machines produce multi-GeV beams with average power in the megawatts. The photo below shows technicians inspecting a pair of original CEBAF cavities at Jefferson Lab; nominal accelerating potential of the pair is 10 MeV. Upgrades at CEBAF have allowed for "cryomodules" (8 -cavity cryostats) reaching energies of 100 MeV.

Image courtesy of Jefferson Lab

So, what about the radiation? As you might expect, the high gradients in these devices can produce field emission and dark current that becomes a source of x-rays. A poorly performing cavity can produce dose rates of thousands of rad/h. And, as the gradient increases, x-ray *energy* increases. Field-emitted electrons can be captured by the accelerating field and accelerated to nearly the full gradient of a superconducting cryomodule, producing 100+ MeV x-rays.

But wait, there's more! If you've studied your physics, you know that high energy photons (threshold energy is about 10 MeV in common materials) can produce photo-neutron interactions, resulting in neutron radiation production (neutron radiation levels may reach about 1/10 that of the photons). So, a high-energy cryomodule can be a source of very high levels of photon and neutron radiation – *just from turning on the RF*. Obviously, no one is allowed in the accelerator vault under these conditions.

But wait, there's even more! Now that we've introduced nuclear interactions into the mix, we must also consider residual radioactivity, and this can be significant. Activated accelerator components like cryomodules and nearby hardware irradiated by high energy dark current beams, can produce residual whole-body dose rates approaching those that define a high radiation area. SRF components like cavities must even be checked for residual activity after certain steps during testing and assembly.

And all of the above conditions occur without *intentionally* accelerating a single particle.

I hope this introduction to these ancillary sources gets you thinking about these issues and how they can make radiation safety efforts at accelerators challenging and interesting.

Welcome New NRRPT Members

Congratulations to the following individuals who successfully passed the USA **NRRPT** Examination on August 10, 2024:

Omar Y. Al-Somali	Matthew D. Groharing	Jacob R. Nessen
Matthew S. Battistel	Carson C. Hall	Claire C. Papas
Brian A. Bowman	Seamus C. Hanley	Paul B. Pierson
Ryan Brasure	Steven J. Henneman	Curtis Roberts
David W. Byrd	Geoffrey A. Howard	Israel S. Salcedo
Mark D. Caldwell	Joel P. Jackson	Rico J. Sanchez Vallejo
Cristhian N. Colon Gonzalez	Eric R. Jones	Eric R. Sandstrom
Matthew R. Eder	Daniel Kozina	George M. Shearouse
Brian D. Ellingson	Jason T. Leinss	Jacob T. Southerland
Ryan A. Elsener	Brandon Longo	Jacob O. Taube
Benjamin Eskew	Ethan Martin	Stephen R. Theiss
Andrena M. Field	Tyler Minarik	Corron D. Thomas
Jonothon Garry	Adam Minkler	Blake E. Werner
Spencer L. Gray	Tyson J. Moore	Jonathan D. Whipple
		Sandra Xie

Congratulations to the following individuals who successfully passed the Canadian **NRRPT** Examination on November 19, 2024:

Amy K. Gates	Connor P. Lahey
Peter Henderson	Dylan Lollar

Bio for Karla Rendell
NRRPT Secretary/Treasurer

I started in the nuclear industry in 1993 at the West Valley Demonstration Project in West Valley, New York. West Valley Demonstration Project (WVDP) originally operated as Nuclear Fuel Services (NFS), by reprocessing spent nuclear fuel assemblies to extract the usable fuel from fission product. It is now a Department of Energy (DOE) clean-up site set up by President Jimmy Carter in 1981 that is still being decommissioned. I started out as a Radiological Control Technician (RCT) and worked my way through the site qualification program. Once I was qualified as a DOE RCT, the site program had a voluntary program to prepare technicians to take and pass the National Registry of Radiation Protection Technologists (NRRPT) exam. I passed the exam in February of 2000. It's hard to believe that was 25 years ago!

During my 20-year tenure at WVDP, the employment structure changed multiple times. I was chosen to aid the Radiation Protection training department with setting up a qualification program for subcontract Radiological Control Technicians (RCT). This led to a full-time job of managing the training program for RCTs and the site radiological worker program. I was also cross trained in the dosimetry department where I ran equipment to process thermoluminescent dosimeters (TLD), whole body counts, prepared urine samples for shipment and dose reports.

In 2013 I had the opportunity to join the Babcock & Wilcox Technologies (BWXT) team at NFS in Erwin, Tennessee. I accepted the position of Radiation Technician Supervisor which was the beginning of my participation with the NRRPT Exam Panel. I joined the panel in 2014 with the support of my new management team at NFS. I have been an active member of the exam panel for 11 years now and was recently elected to the Board of Directors as the Secretary/Treasurer in January 2024. I held the positions of Senior Engineering Watch and Health Physicist at NFS and I am currently the Radiation Monitoring Manager and have proctored radiation technicians (RT) taking exams at the Erwin, TN site. I am encouraging the site RTs to study for and take the exam to promote the mission of the NRRPT. I am honored and privileged to be a member of the NRRPT team, and I would encourage anyone in the nuclear industry to join us with supporting our mission. I am proud to be a part of this great organization and grateful to my employer for supporting the NRRPT.

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

Exam Panel Chairman—Karen Barcal—kbporch928@sprintmail.com

Executive Secretary—DeeDee McNeill—nrrpt@nrrpt.org

How NRRPT Helped Me

by Diana Baker

Introduction:

Diana Baker is the Senior Radiation Protection Manager at the Darlington Nuclear Refurbishment in Canada. She started her career in nuclear energy 20 years ago, primarily in radiation protection. Working for Ontario Power Generation, Diana had the opportunity to work in various capacities at both the Pickering and Darlington Nuclear Plants. She joined the Darlington refurbishment project nine years ago, managing a large workforce of Radiation Protection Technicians, NRRPT-certified Technologists, and Certified Health Physicists. As the Darlington Refurbishment Project ends, Diana's team has set their sights on the upcoming Pickering Nuclear Refurbishment project.

What is the NRRPT:

The need for the NRRPT evolved out of the nuclear industry's desire for responsible and competent radiation protection technologists. The NRRPT was established in 1976 through the sponsorship of the Health Physics Society and the American Board of Health Physics. The objective of the NRRPT is to encourage and promote the education and training of radiation protection technologists and, by so doing, promote and advance the science of health physics. To do this, the NRRPT has established a credentialing exam. This criteria-based, 150-question exam covers broad-based radiation protection knowledge of accelerators, university health physics programs, medical health physics, power reactors, government radiological facilities, radioactive waste disposal, transportation of radioactive material, fundamentals, and regulatory requirements. The NRRPT has been endorsed in various ways by several organizations. The Institute for Nuclear Power Operations (INPO) and the Department of Energy (DOE) have openly recommended that nuclear facilities encourage their personnel to seek NRRPT Registration. The Nuclear Regulatory Commission (NRC) provides support by assigning a staff member to the NRRPT Panel of Examiners. HPS members established the NRRPT, and most of the NRRPT Board of Directors and panel members are active members of the HPS national and local chapters. Nuclear facilities (i.e., power plants, government facilities, universities, medical facilities, and military services) provide incentives for personnel to seek and maintain registration. The NRRPT is ACE-accredited for thirty college credits.

How it has helped me:

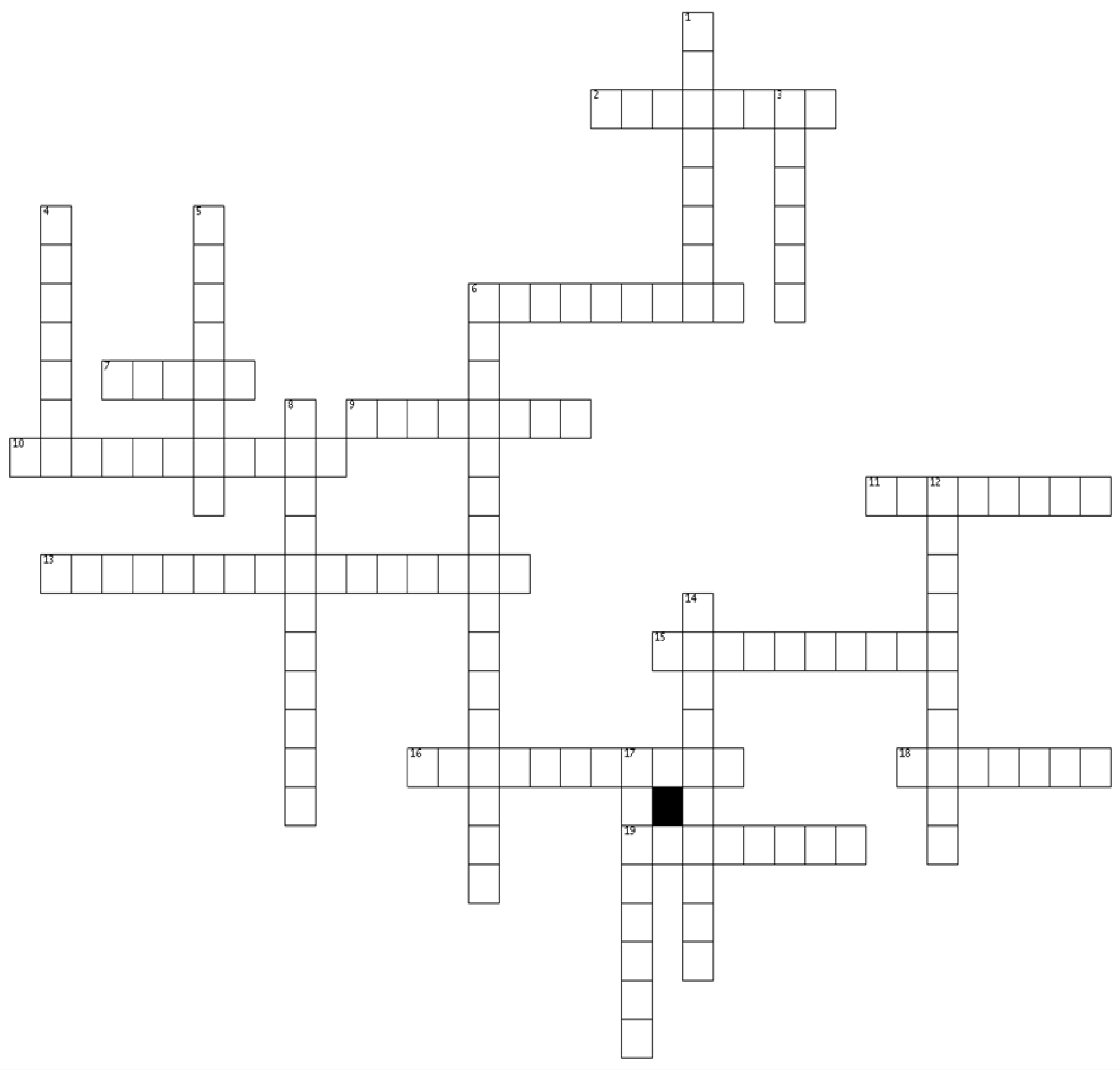
I began my career as a radiation protection technician. Within a few short years, I realized I wanted to advance in the Ontario Power Generation ranks. My mentor introduced me to the NRRPT organization and recommended that I pursue my certification. After passing the exam, I received my first promotion and continued moving up the ranks of my profession. I have taken my positive experience and promoted the registry among my peers and the Canadian Nuclear Industry. I was later asked to join the panel of examiners for the NRRPT and subsequently was nominated and elected to the Board of Directors. The relationships that I have developed with the members of the board, who come from multiple disciplines and hold key positions in their industry, continue to benefit my development. In 2023, working with the NRRPT board, Professor Tom Johnson of Colorado University and fellow Canadian Frank Tourneur established a Canadian NRRPT accreditation.

To answer how the NRRPT helped me, I summarize it as a solid understanding of the principles of Health Physics and how to apply them in real time, confidence in myself, professional success, and a wealth of information to draw upon from the registry and its members.

Crossword Puzzle—Acronyms

By Kelli Gallion-Sholler

Answers are on the back page of this Newsletter



Crossword Puzzle—Acronyms

ACROSS

2. _____ Biological, Radiological, and Nuclear (CBRN)
6. _____ _____ Lived Low Level Radioactive Waste (VSLLLRW)
7. _________ River Unidentified Deposits (CRUD)
9. _____ Equivalent Man (REM)
10. Nuclear ______ Safety (NCS)
11. _____ License (COL)
13. Canada____ ____(CANDU)
15. _____ _____ fuel (MOX)
16. _____ (TRU) Waste
18. A_____1000 (AP1000)
19. _____ Standards Association (CSA)

DOWN

1. _____ Nuclear Reactor (MNR)
3. Safety Control Rod ______ ______ (SCRAM)
4. _____ Generating Station (NGS)
5. Office of _____ Radioactive Waste Management (OCRWM)
6. Radionuclide _____ (RVG)
8. Nuclear _____ _____ System (NSSS)
12. _____ _____ Reactor (MSR)
14. _____ _____ Release (FGR)
17. Severe _____ Management (SAM)

Exam Achievement Award

By Kelli Gallion-Sholler, Awards Committee Chairman

The **NRRPT** Exam Achievement Award is given to the individual with the highest score on each scheduled **NRRPT** examination for becoming a Registered Radiation Protection Technologist. In addition to a letter of recognition, the individual receives a complimentary "high scorer" membership plaque and is featured in an article in the **NRRPT** Newsletter. It is a great accomplishment to pass the exam and even a greater feat to achieve the highest score. Congratulations to our high scorers!

High Scorer—August 10, 2024 USA Examination

Ethan Martin

I reviewed Federal Regulations, NRC and DOE health physics training material, and Thomas Johnson's online course to prepare for the exam. The online course was by far the most helpful.

I have worked at navy nuclear facilities, commercial nuclear power plants, and DOE nuclear sites. The experience from those jobs is a key part of my radiation protection career. I am currently a Senior Health Physics Technician at the Hanford site. The fundamentals are essential to my day to day actions and decisions. I have always encouraged my coworkers to consider the *why* and *how* of our work. I continually seek to improve myself and the radiation protection program I am a part of.

High Scorer—November 19, 2024 Canadian Examination

Amy Gates

My name is Amy Gates, and I have had the opportunity of working as a Radiation Protection Technician at Bruce Power since early 2007. This role has been both rewarding and challenging, requiring a deep commitment to safety and excellence in our field. As I prepared to take the National Registry of Radiation Protection Technologists (NRRPT) exam, I was fortunate to participate in the 2024 NRRPT training course organized by Ontario Power Generation (OPG). This comprehensive program spanned 10 weeks and featured instruction from nuclear professionals, Thomas E. Johnson and Frank Tourneur. Each week included three informative 2-hour online sessions. In addition to the structured training, I dedicated six months to self-study in preparation for the exam, primarily utilizing the course materials. This combination of formal instruction and independent study underscores the importance of dedication and the support of colleagues in achieving professional milestones. The journey to registration was not just a personal achievement; it reflects the collective efforts of a supportive work environment. I am grateful for the resources and mentorship provided by OPG, as well as the encouragement of my peers and line management at Bruce Power, which played an important role in this accomplishment.

Rad Movie Review!

Rad Movie Review (In Honor of the Late Pete Darnell) - Oppenheimer

By Michelle Kovach

Hello members! It is I, one of your newest Rad Movie reviewers. Today, I'll be providing a brief review of the acclaimed 2023 movie, *Oppenheimer*.

Oppenheimer delves into the life and mind of J. Robert Oppenheimer as he journeys through his role during the Manhattan Project and continued missions supporting the nation's use of nuclear weapons. The Manhattan Project was a collaborative effort to build the first nuclear weapon while the United States was involved in the Second World War. In 1943, Los Alamos was chosen to be the secret community where the most brilliant minds in the country would gather to create the first nuclear weapon, with Oppenheimer appointed as the project's director.

The movie features several well-known scientists that Oppenheimer meets with or works closely with in Los Alamos. These include but are not limited to greats such as Albert Einstein (renowned for developing the theory of relativity), Niels Bohr (famous for his model of the atom, known as the Bohr atom), Edward Teller (the father of the hydrogen bomb), and Ernest Lawrence (Nobel Prize winner for his invention of the Cyclotron). The brilliance of these minds brings both harmony as they work towards a common goal and competitive, occasionally hostile, interactions.

The film also explores Oppenheimer's personal life, including his affiliation with the Communist Party, family moments at his ranch outside of Los Alamos, and the intense scrutiny he faced over his access to classified information and access to nuclear materials. This was despite being part of perhaps the most secretive mission the United States had undertaken.

The portrayals, acting, and cinematography in the movie are stellar, justifying the multiple Academy Awards it won. This three-hour movie grips the audience's attention from the start; despite its length, it remains captivating and fast-paced, making it hard to take a restroom break without fearing to miss something crucial.

One of the famous lines by Oppenheimer, “Now I am become death, destroyer of the worlds,” is repeated in this film. This quote is often misunderstood as Oppenheimer expressing regret for his role in creating the atomic bomb. However, Oppenheimer didn’t regret his duty-bound creation of the bomb. He preferred the United States to accomplish this before the Nazis. Despite the casualties from Fat Man and Little Boy (the atomic bombs dropped on Hiroshima and Nagasaki), their deployment ultimately saved millions more lives by hastening the end of World War II.

I give *Oppenheimer* four and a half stars (out of five) for its entertainment value and overall accuracy.

What is Prussian Blue?

What is Prussian Blue?

Prussian Blue is one of the earliest synthetic dyes, widely used in painting and printing since the early 1700s. It is also significant in the machining of steel and iron parts, revealing fine details on surfaces and aiding in repair work. Additionally, Prussian Blue is notable in radiation protection, particularly for sequestering cations from thallium poisoning and ingestion of radioactive cesium

Synthesis

Prussian blue is synthesized through the oxidation of ferrous ferrocyanide salts, which are white solids with the formula $M_2Fe[Fe(CN)_6]$ where $M^+ = Na^+$ or K^+. The absence of deep color is due to the iron being solely in the ferrous state. By oxidizing this white solid with hydrogen peroxide or sodium chlorate, ferricyanide is produced, yielding Prussian Blue.

A colloidal form of Prussian blue, $KFe^{3+}[Fe^{2+}(CN)_6]$, can be generated from potassium ferrocyanide and iron(III): $K^+ + Fe^{3+} + [Fe^{2+}(CN)_6]^{4-} \longrightarrow KFe^{3+}[Fe^{2+}(CN)_6]$

Similarly, potassium ferricyanide's reaction with iron(II) results in the same colloidal solution. When an excess of Fe(III) is added to the reactions above, the insoluble form of Prussian blue is obtained: $4Fe^{3+} + 3[Fe^{2+}(CN)_6]^{4-} \longrightarrow Fe^{3+}[Fe^{3+}Fe^{2+}(CN)_6]_3$

Despite being derived from cyanide salts, Prussian blue is non-toxic because its cyanide groups are strongly bound to iron. Both ferrocyanide and ferricyanide compounds are stable and non-toxic due to strong iron-cyanide coordination.

Medicine

Prussian Blue's capacity to incorporate monovalent metallic cations makes it useful for sequestering certain toxic heavy metals. Pharmaceutical-grade Prussian Blue is used for individuals who have ingested thallium or radioactive cesium. According to the International Atomic Energy Agency (IAEA), an adult male can safely consume up to 10 grams of Prussian Blue daily. The U.S. Food and Drug Administration (FDA) confirms that 500-mg Prussian Blue capsules are a safe and effective therapy in certain poisoning cases.

Radiogardase is a commercial product for removing Cesium-137 from the intestine, thereby indirectly clearing it from the bloodstream by interrupting the enterohepatic circulation of Cesium-137, significantly reducing exposure time.

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NRRPT Night-Out in Key West, FL
February 2, 2025

SEVEN FISH RESTAURANT
SIMPLE. GOOD. FOOD.

*** Thank you to our generous NRRPT Night-Out sponsor — Ameriphysics ***

Tom Hansen (Ameriphysics) and wife Annette

Board Chairman Danny McClung addresses the group

NRRPT Night-Out Group Photos

NRRPT Board, Panel Members, family & friends!

Back to Business in Key West, FL!!

Exam Panel (and Board members) hard at work

25 Years + as an RRPT

The following members were registered 1995

ABDELLA, RITA M.
ADAMS, JR., LYLE F.
ALLISON, SAMUEL B.
ALVAREZ, CHARLES J.
AMY, BLANE M.
ANDERSON, MARY E.
ANTHONY, TEDDY W.
ARCEO, VICTOR H.
ARNOLD, DOMINIQUE M.
AVERY, LARRY D.
BALKO, STEPHEN H.
BARNES, KENNETH R.
BARTON, MARK R.
BAUGH, KENNETH S.
BAUGHER, JR., NORMAN F.
BELKOFER, III, DONALD R.
BENAVIDEZ, ROBERT A.
BENSON, BRAD T.
BIRCHFIELD, KEVIN M.
BITTO, IV, LOUIS H.
BLACK, JEFFREY L.
BLUMER, JAMES A.
BOILES, GREGORY S.
BOLEN, HENRY M., CHP
BOND, GEORGE P.
BORUN, MARK A.
BOSCH, LOUIS J.
BOTHUN, KAREN J.
BOWMAN, PATRICK (AL) A.
BRADFIELD, THOMAS A., CHP
BRAGENZER, ROBERT A.
BRANNAN, PATRICK B.
BRANTLEY, LARRY D.
BRITTON, LARRY E.
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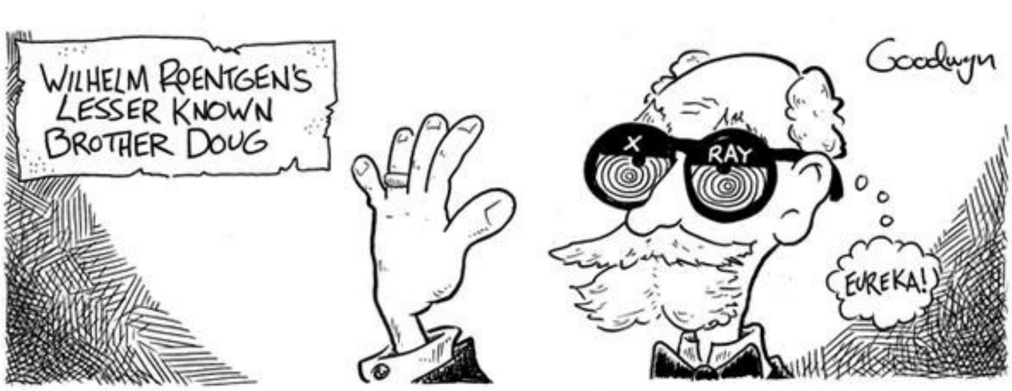

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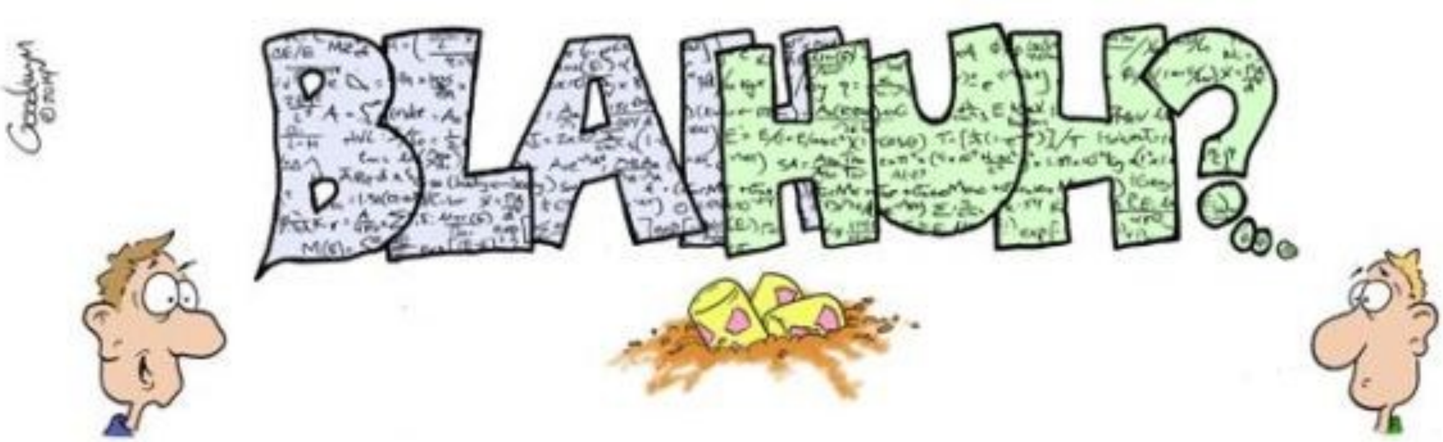

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