

PNNL-36929

The Radiation Detection for Nuclear Security Summer School Fiscal Year 2024 Report

October 2024

Benjamin S McDonald

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Pacific Northwest National Laboratory
Richland, Washington 99354

Summary

The Pacific Northwest National Laboratory (PNNL) hosts the Radiation Detection for Nuclear Security (RDNS) Summer School. This unique course provides students with an overview of nuclear security missions, the technical foundation of applied radiation detection technology, and interactive demonstrations and exercises to connect theory to practice in an evolving research and development area. Fiscal year 2024, an off-year year for the school, included reviewing course content, and sharing about the school in a student engagement session at the Institute of Nuclear Materials Management Annual Meeting. Planning is underway for the 10th RDNS summer school, which is scheduled for the summer of 2025.

Acknowledgments

The RDNS Summer School is funded by the National Nuclear Security Administration's (NNSA's) Defense Nuclear Nonproliferation Office of Research and Development.

Erin Kinney, Claudia Romero, and Mary Bliss are thanked for their efforts supporting the summer school development in fiscal year 2024.

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1.0 Introduction

The Pacific Northwest National Laboratory (PNNL) has held nine Radiation Detection for Nuclear Security Summer Schools since pioneering the course in 2012. It features technology demonstrations, tours of operational facilities, and interactive exercises with detection equipment and methods. Figure 1 shows a photo of students participating in a tour of a clean room at PNNL. Students engage with PNNL experts and external leaders in nuclear security to develop a deep understand of challenges in the field and state of the art technologies. Each year, the course is revised based on feedback from students and input from stakeholders to keep it on the cutting edge of technology and engaging.

The course is designed for graduate students in science and engineering programs with interest in careers within the US Department of Energy national laboratory system or federal government agencies responsible for nuclear security. Undergraduate students are also considered. Priority is given to students whose research is funded by the NNSA's Office of Defense Nuclear Nonproliferation R&D and students performing research in fields with potential nuclear security applications (e.g., the NNSA University Consortia). Enrollment is limited to approximately 16 students, which is based on the need for certain tours and the desire to develop a close-knit cadre during the school.



Figure 1. Students tour the Shallow Underground Laboratory during Radiation Detection for Nuclear Security Summer School on PNNL's campus in Richland, Washington.

2.0 Fiscal Year 2024 Activities

In the fiscal year (FY) 2024, PNNL completed several key activities to improve and promote the summer school. To improve logistics, the team prepared a digital notebook that contains details for all aspects of preparing and executing the school. Previously, this was a set of disparate files that were handed down among project administrators and coordinators over the past eleven years. This notebook will streamline processes for new staff who help with the school and help

document feedback and improvements from year to year as a living document. A screenshot of the notebook is shown in Figure 2.

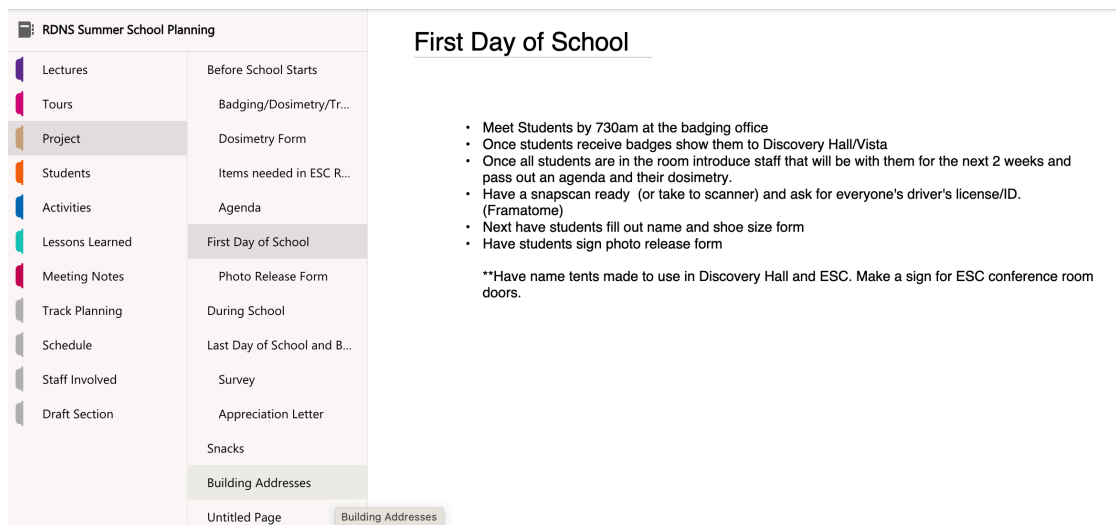


Figure 2. Screen capture of the planning notebook created for the summer school.

The team also learned about best practices used in other training courses at PNNL, which may be incorporated. These include making sure learning objectives and assessments are clearly defined for each course element, and placing the school content (lectures, interactive activities, etc.) in an online, internal collaboration environment¹.

To share and promote the school with the broader nuclear security community, we presented a paper at the Institute of Nuclear Materials Management (INMM) Annual Meeting held in Portland, OR². The paper provides an overview of the school, a retrospective on its evolution, and plans for the next school in 2025. As part of the paper preparation, we compiled statistics on the RDNS alumni including, how many students were served each year, their universities, and, where available, information on the current employment. The school has provided over 130 students with a deeper understanding of radiation detection and nuclear security. One goal of the school is to excite students about careers in nuclear security. A LinkedIn survey showed that over 50 alumni have made careers working in related positions at national labs, government agencies, or international entities engaged in nuclear security work such as the International Atomic Energy Agency (IAEA).

The presentation at INMM prompted several useful discussions with other attendees working in student engagement and workforce development efforts. The team learned about the International Nuclear Security Education Network (INSEN), which is stewarded by the IAEA and develops curriculum for nuclear security courses, primarily at universities. We are in the process of getting access to this content to review its suitability for updates to the RDNS summer school curriculum.

¹ Such as gAXIS hosted by Oak Ridge National Laboratory, <https://npac.gaxis.ornl.gov/login/?lang=en>.

² <https://resources.inmm.org/annual-meeting-proceedings/radiation-detection-nuclear-security-summer-school>

3.0 Plans for Fiscal Year 2025

The team is preparing for the next school June 16-27, 2025. Application submission opens Dec 1, 2024, and closes on Feb 27, 2025. In FY 2023, a stipend of \$1200 was made available to students to offset travel costs. This made attending the school more feasible for some students, broadening the applicant pool. The team plans to include a travel stipend again in FY 2025.

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