

SARP Analyst Course: Now and Then

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Nuclear Criticality Safety Program (NCSP)
Technical Program Review
February 20-23, 2024
Brookhaven National Laboratory, Riverhead, New York

Outline

- Course Info and History
- Project Description
- Progress

What is the course about?

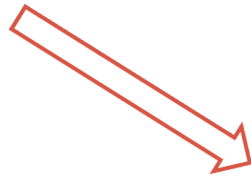
The course will **provide** detailed **instruction on** the radioactive material package **shielding analyses and NCS evaluation** fundamentals needed by **analysts/practitioners** (i.e., safety analysts and/or technical reviewers) **to prepare and/or review** technical analyses for the **SARP documentation**.

The Analyst Course also provides an overview of regulations and guidelines in addition to detailed class exercises associated with the package shielding and NCS analyses.

How is it offered?

- Part of the RAMPAC Certification Program - Packaging University Courses

– <https://rampac.energy.gov/home/education/packaging-university-courses#Radiation>



Date (tentative)	Title (course fee)	Location
February 26-March 1, 2024	NP 658 – Use of Certified Type B and Fissile Packages (\$2,500)	Los Alamos, NM
March 4-8, 2024	Radiation and Nuclear Criticality Analysis of RAM Packages (\$2,500)	Oak Ridge, TN
April 8-11, 2024	NP 625 – Transportation Physical Security (\$2,500)	Albuquerque, NM
April 15-19, 2024	NP 605 – Thermal Modeling and Testing of RAM Packages (\$2,500)	Albuquerque, NM
May 20-24, 2024	NP 606 – Containment Analysis of Radioactive Material Transportation Packages (\$TBD)	Livermore, CA
June 3-7, 2024	NP 615 – Facility Decommissioning and Facility/Site Closure (\$2,500)	Lemont, IL
June 12-19, 2024	NP 604 – Radioactive Material Packaging QC/QA: Part 1 Welding/NDE Quality Control, & Part 2 Software Quality Assurance (\$2100)	Livermore, CA
June 17-21, 2024	Fundamentals of Nondestructive Assay (\$2,500)	Oak Ridge, TN
August 5-9, 2024	NP 652 – Response to Radioactive Material Transport Emergencies (\$2,500)	Lemont, IL
August 12-16, 2024	NP 608 – Radioactive Material Package Operation and Leak Testing (\$TBD)	Aiken, SC
August 19-23, 2024	Fundamental of Cyber-Physical Security (\$2,500)	Richland, WA
August 26-30, 2024	NP 710 – Nuclear Security During US Domestic Transport (\$2,500)	Lemont, IL

Previous Offerings

- Offered in 2016 and 2019
- Student and instructor feedback:
 - Too much emphasis on regulations
 - More applications
 - More shielding/criticality examples
 - More hands-on experience
 - Less fundamental/basic information
 - Better flow of content

Revamp needed

Work Scope

Task 1: Conversion of Current Course into a Workshop

- Archive the previous course
- Record videos over the previous presentations

Task 2: Update the Current Analyst Course to Stimulate More Interest

- Address student and instructor feedback
- Restructure the course
- Offer the restructured course in ORNL

Progress

Task 1: Conversion of Current Course into a Workshop

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Progress

New course outline

Day	Module	Content	Duration (hrs)
1	1.1	Introductions and Course Overview	0.75
	1.2	Types of Packages and Regulations Overview	0.75
	1.3	SARP Overview	0.5
	1.4	Fundamentals	1
	1.5	Radiation Shielding	1.5
	1.6	Nuclear Criticality Safety	1.5
	1.7	General Information on Transportation Packages	0.75
	1.8	Generic Package Exercises	0.75
2	2.1	Description of Shielding Design and Applicable Regulations	1
	2.2	Exercise on Description of Shielding Design and Applicable Regulations	0.75
	2.3	Radiation Sources Considered	1
	2.4	Exercise on Radiation Sources Considered	0.75
	2.5	Considerations in the Shielding Model	1
	2.6	Exercise on Considerations in the Shielding Model	0.75
3	3.1	Description of Criticality Design and Applicable Regulations	1
	3.2	Exercise on Description of Criticality Design and Applicable Regulations	0.5
	3.3	Package Content and Model Description	0.75
3	3.4	Exercise on Package Content and Model Description	0.75
	3.5	Criticality Calculations	1.0
	3.6	Exercise on Criticality Calculations	1
	3.7	Benchmark Evaluations	1.0
	3.8	Burnup Credit for Spent Nuclear Fuel	0.75
	3.9	Exercise on Benchmark Evaluations and Burnup Credit	0.75
	3.10	Summary of Results	0.5
4	4.1	Combined shielding/criticality exercise/HW on the Generic Package Utilizing/demonstrating computer codes like SCALE/MCNP/ORIGEN	6.5
	4.2	Take home Problem	1
5	5.1	Review of shielding/criticality Problem	0.5
	5.2	Specific DOE/NRC Requirements	1.25
	5.3	Best approaches for preparing and reviewing SARP analyses	0.75
	5.4	Course review and closure	0.5
	5.5	Exam	1

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	3.2	Exercise on Description of Criticality Design and Applicable Regulations	0.5
	3.3	Package Content and Model Description	0.75
	3.4	Exercise on Package Content and Model Description	0.75
	3.5	Criticality Calculations	1.0
	3.6	Exercise on Criticality Calculations	1
	3.7	Benchmark Evaluations	1.0
	3.8	Burnup Credit for Spent Nuclear Fuel	0.75
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		Shielding Evaluation	1.5
		Exercise on Shielding Evaluation	1

Progress

- Course will be offered March 4-8, 2024
- So far, 8 participants from INL, LANL, LLNL, SNL, SRS
- Working on adding it for-credit in UNR

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Future

- The plan is to continue offering this course once or twice a year.

Questions/Comments/Bright Ideas?

