National Nuclear Security Administration

United States
Department of Energy
National Nuclear Security Administration

International Nuclear Security

M1: Workshop Overview and Introduction

Research Reactor Sabotage Protection Workshop

INS International Nuclear Security
Reducing Risk of Nuclear Terrorism

SAND2025-02023O

Introductions

- Instructors
- Trainees
  - Name and Organization
  - Job Responsibilities
  - Experience in the area of physical protection and research reactors
  - Expectations for this workshop

Workshop Goal and Objectives

Goal: Understand the concepts related to the protection of research reactors from radiological sabotage and develop the skills required to analyze the associated physical protection system (PPS) requirements

Objectives:

- Become familiar with the concepts of Unacceptable Radiological Consequences (URC) sabotage and protection target identification
- Understand approaches to designing and implementing a PPS at a research reactor facility, including the development of a protective strategy
- Develop skills required to analyze and evaluate a research reactor PPS at a concept level
- Understand the concept of integrated response

Workshop Format

Classroom Presentations

Group Discussions

Practical Exercises

Course Agenda (1)

Day 1: Research reactor targets and security recommendations	
1000-1030	**M1: Introductions and Workshop Overview**
1030-1045	**Break**
1045 – 1130	**M2: IAEA nuclear security guidance for research reactors** The module will discuss IAEA nuclear security recommendations as they apply to research reactors.
1130 – 1230	**M3: Radiological sabotage protection targets at research reactors** Module 3 will discuss the concept of and international practices for URC/HRC criteria as they apply to research reactors. Using examples of common research reactor safety scenarios, the module will discuss approaches to identifying MTR sabotage protection targets.
1230-1330	**Lunch**
1330-1430	**M4: Hypothetical research reactor facility familiarization** The discussion will familiarize the participants with a hypothetical research reactor facility, which will be used in practical exercises.
1430--1445	**Break**
1445-1545	**Facilitated discussion: Hypothetical facility assumptions** The discussion will seek to develop a set of assumptions about the hypothetical facility including the site layout, protection targets, designation of security areas, relevant PPS elements, response capabilities and DBT. The goal of the discussion is to align the hypothetical facility with the partner-country situation and context. The discussion will consider both external and insider threats.
1545-1615	Closeout discussion

Day 2: Research reactor PPS concepts	
0945 – 1000	Review of Day 1
1000-1045	**M5A: PPS for research reactors – design fundamentals** Module 5A will discuss the PPS design fundamentals and the security area considerations for research reactor facilities. The module
1045 – 1100	**Break**
1100 - 1130	**M5B: PPS for research reactors - detection** Module 5B will discuss PPS technologies as they apply to research reactors and with a focus on the partner-country facility. The module will focus on the technologies and operational considerations for IDS (exterior and interior), assessment and surveillance systems, alarm stations, and access control.
1200-1230	**M5C: PPS for research reactors – delay** Module 5C will discuss technology considerations and international good practices for delay.
1230 – 1330	**Lunch**
1330-1415	**MP5D: Response and protective strategy** Module 5D will discuss different types of protective strategies, considerations of on-site and off-site response, response infrastructure, and the use of time-motion studies.
1330-1500	**Exercise 1: PPS design concepts (begin)** The participants will be divided into two groups. Group D will be assigned conceptual PPS design tasks for detection and delay at a) limited access area; b) protected area, and c) vital areas and strong rooms. The team will consider the aspects of delay (vehicle and personnel barriers), detection (including assessment), surveillance, and alarm station operations. Group R will formulate a protective strategy based on a mixed on-site and off-site response. The exercise will use the hypothetical research reactor facility discussed during Day 1.
1500 - 1515	**Break**
1515 – 1600	**Exercise 1: PPS design concepts (finish)** The groups will present their designs. A facilitated discussion will be conducted regarding the integration of the PPS elements.
1600 - 1630	Close Out Discussion

Course Agenda (2)

Day 3: Research reactor Protective Strategy	
0945 – 1000	Review of Day 2
1000-1100	**Module 6: Table-top exercises (TTX) as a tool for PPS analysis** The module will present a simplified methodology for conducting tactical-level TTX exercises. Instructors will conduct a TTX demonstration.
1100 – 1115	**Break**
1115 – 1200	**Exercise 2: TTX scenario development (begin)** Based on the results of Exercises 1, the participants will develop exercise scenarios for specific targets and cardinal directions.
1200 – 1300	**Lunch**
1300 – 1345	**Exercise 2: TTX scenario development (finish)** The groups will complete their work.
1345 - 1400	**Break**
1400-1530	**Exercise 3: TTX exercises** The participants will conduct TTX exercises using Exercise 2 scenarios. The class will participate in a facilitated discussion of exercise results.
1530 – 1615	Close Out Discussion

Day 4: Research reactor integrated response and workshop conclusion	
0945 – 1000	Review of Day 3
1000-1100	**Module 7: Coordination of security response and emergency response** Module 7 will discuss the fundamentals of emergency response at a research reactor and the coordination of emergency response and security response.
1100 – 1115	**Break**
1115 – 1200	**Facilitated discussion: Integrated response** The instructors will discuss an integrated response scenario.
1200 – 1300	**Close out discussion and recap of key outcomes**
1300	**Workshop completion and adjourn**

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Questions, Comments, Concerns?