# International Response Training Course Design Document



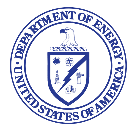
**International Response Training**

Version 2.0, April 30, 2020

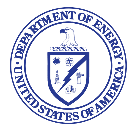
**Integrated Project Team:**

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| --- | --- | --- |
| **Name** | **Function** | **Lab** |
| Charlie Lopez | Project Lead – Subject Matter Expert | SNL |
| Carrie O’Hara | Instructional Designer | SNL |
| Ava Harvey | Instructional Design Support | ORNL |
| Tony Burdick | Subject Matter Expert | LLNL |
| Gerald Anderson | Subject Matter Expert | PNNL |
| Doug Day | Subject Matter Expert | PNNL |

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Version Control

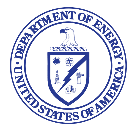
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| **Version** | **Description** | **Approval Date** |
| 1.0 | Initial issue. | 2016 |
| 2.0 | International Response Training (Major revision) | 2020 |
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Approvals

|  |  |  |
| --- | --- | --- |
| **Submitted by:** |  |  |
| Jason Moulette, Program Manager  ORS |  | Date |
|  |  |  |
| **Approved by:** |  |  |
| Kristen Hirsch, Director  ORS |  | Date |

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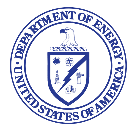
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Revision Summary

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| Module | Description |
| All Modules | Major Revision |
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# Acronyms

|  |  |
| --- | --- |
| Acronym | Full Title |
| BIT | Basic Instructor Training |
| CDD | Course Design Document |
| DOE | Department of Energy |
| HQ | Headquarters |
| IAEA | International Atomic Energy Agency |
| IRT | International Response Training |
| LLNL | Lawrence Livermore National Laboratory |
| NNSA | National Nuclear Security Administration |
| NSS | National Security Series |
| ORNL | Oakridge National Laboratory |
| ORS | Office of Radiological Security |
| PNNL | Pacific Northwest National Laboratory |
| POC | Point of Contact |
| PPS | Physical Protection System |
| SAT | Systematic Approach to Training |
| SME | Subject Matter expert |
| SNL | Sandia National Laboratory |
| WMD | Weapons of Mass Destruction |
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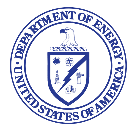
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Executive Summary

**Design Goal**

The International Response Training (IRT) Course was developed in 2016 for the purpose providing first responders a working knowledge of the ability to respond to an attempted theft of radiological material. Since that time Subject Matter Experts (SME) working internationally and domestically have gained better insight to the challenges facing first responders.

On June 25, 2019, a Subject Matter Expert Analysis of the IRT was conducted. The team conducting the analysis consisted of:

* Charlie Lopez – Sandia National Labs
* Matt Thompson – Sandia National Labs
* Jill Manion – Pacific Northwest National Labs
* Mike Hazel – Pacific Northwest National Labs
* Doug Day – Pacific Northwest National Labs
* Tony Burdick – Lawrence Livermore National Labs
* David Leonardo – Lawrence Livermore National Labs
* Justin Walker – Sandia National Labs Contractor (Phoenix Police Department)
* Ryan Grothe – Sandia National Labs Contractor (Denver Police Department)
* Joshua Defoe – Sandia National Labs Contractor (San Diego Police Department

**Recommendations**

The team conducting the SME recommended the following changes to the IRT Course:

Target Audience: Primary audience should be site personnel responsible for security and responders (police and private security), alarm station operators, and police instructors. Regulators are also encouraged to attend the training.

Module 1: Course Introduction – revise the goals and objectives, provide a daily schedule. Include the following into the course overview:

* Understand why the rad theft alarms should be prioritized
* Understand how they can respond to an event involving rad material and be safe
* Understand how to optimize response so they can beat the adversary timeline

Module 2: ORS Overview – develop goals and objectives, consider using the ORS Overview video for this module (consider translation issues)

Module 3: Radiation Hazards for Security Responders – develop goals and objectives. Include information on risks posed by a shielded and unshielded source. Keep the overview of radiation. Focus on time, distance, and shielding. Consider developing better graphics and practical exercise to emphasize the concepts of time, distance, and shielding.

Module 4: The Threat – this module is outdated; Sandia National Labs is in the process of revising this module. Address the consequence of a malicious act and develop a catalog of case studies that could be tailored to a course or region depending on the audience.

Module 5: Physical Protection Systems (PPS) and Timelines – revise the module, approach PPS from the viewpoint of a first responder. Provide an overview of equipment and highlight how the response is an integral part of the PPS. Enhance graphics and examples. Keep PPS timeline information.

Module 6: Contingency Plan – Keep Target Folder and Site Response Plan separate. The Target Folder’s current format is too big and too complicated, and it should be replaced with a “quick response card” or “critical info card” that covers things like source, its location, number of people at the facility, containment points, command post/monitoring station location, key point of contact (POC). The response plan being developed for the site should address the Sites actions during the response to an alarm situation – not the actions of the off-site armed response.

Exercises: Allow the option to use either the facilitated tabletop or full tabletop exercise dependent on the maturity of the security program of the participants. This should be at the discretion of the Lead Instructor.

**Timeline**

|  |  |
| --- | --- |
| PROJECT MILESTONES | DATES |
| Design Meeting | June 25, 2019 |
| Design Document Completed | April 30, 2020 |
| Development of Materials (Completed) | August 20,2020 |
| Review and Approval of Materials | August 31, 2020 |
| Approval of Course – Submitted to HQ | September 15, 2020 |
| Pilot Course Delivery | TBD |

**Next Steps**

Once revised, this course will be reviewed and updated on a two-year cycle.

# Introduction

The design for this instructor-led course specifies a four-day duration for up to twenty-five trainees to include individual and small group exercises. International Response Training (IRT) consists of seven modules (see Section 4.0 Course Outline) on containing or resolving a security event involving radioactive materials, based on IAEA NSS 25-G implementing guide. This course is intended for armed responders and other security related response professionals that are responsible for the protection of radioactive materials. The goal of the IRT Course is to provide first responders with the knowledge, skills and abilities to respond in a timely manner to an attempted theft of radiological material.

This course was developed by the U.S. Department of Energy’s (DOE) National Nuclear Security Administration (NNSA) and its national laboratories. The course was created using the Systematic Approach to Training (SAT) process.

## Overview and Background

The Office of Radiological Security enhances global security by preventing high activity radioactive materials from use in acts of terrorism. ORS supports the U.S. Department of Energy’s (DOE) nuclear security goal by preventing terrorists from acquiring radiological materials that could be used as weapons of mass destruction (WMD) or other acts of terrorism.

In support of ORS’s Radiological Material Protection Program, Sandia National Laboratories (SNL) has developed the International Response Training Course to provide relevant response-related training for radiological events. During this course participants will develop, discuss, and exercise their tactics, techniques, procedures, and protocols when responding to a theft event involving high-activity radiological source materials. The training was developed for an international audience and is intended for security personnel, local law enforcement officers site personnel and regulators. The goal of the course is to provide first responders the knowledge skills and ability to respond to an attempted theft of radiological material.

The IRT is international training for first responders that are capable or responsible for containing or resolving a security event involving radioactive materials. The course is designed to assist countries with establishing and maintaining effective response capabilities in the event of an attempted theft of radiological material. The workshop is designed to provide response training, facilitate stakeholder discussions and collaborative response planning activities to enhance their overall response effectiveness and encourage ongoing sustainment activities and communications amongst licensees and first responders. The course is also designed to raise awareness for response stakeholders about the locations and security systems protecting radioactive materials within their jurisdictions.

## Document Purpose

This document serves as a guide for instructional designers when designing course materials and media. It is versioned as the course evolves through two-year review cycles. This document explains the design process, who was involved, and the design recommendations for the development and implementation of the course materials.

## Target Audience

The IRT instructors will work with the country project team to identify key stakeholders that would be involved in the initial response to a security related event (e.g. a terrorist attack) at a site. These stakeholders will vary but some common examples are as follows:

1. Police Department
2. Site Personnel
3. Private Security
4. Alarm Station Operators
5. Regulatory Authority

# Cultural Dimensions

Cultural dimensions influence the learning process as well as classroom communication. Formal country cultural analyses will be developed and included when funding resources are identified. It is expected that classroom instructors are knowledgeable of the country and culture considerations.

# Course Design Overview

The following section describes the learning environment that this course is designed to accommodate.

## Content Delivery

This course is designed as a face-to-face, onsite course. The content delivery for this course includes:

* Lectures, instructor-facilitated discussions, and scenario examples that provide background information and general principles for the subject matter.
* Integration of appropriate technology to add interactivity and increase participant engagement/interaction (or other media e.g. eLearning or video with study guide).
* Content flows from general to more detailed knowledge. This design approach provides the instructor with planned stopping points based on the participants’ needs and expertise.

## Deliverables

The final package deliverables include the following (\* items to print):

1. Analysis/TTM and design documents
2. Agenda\*
3. Instructor guide\*
4. Participant workbook\*
5. PowerPoint presentation
6. Exercises
7. Level-1 Evaluation form\*
8. Media catalog

## Facilities, Equipment, and Constraints

Presentation and exercises for this course require a classroom that will comfortably seat all trainees. Additional requirements may include the following:

* Computer access and projection capabilities for instructors
* Additional space to accommodate breakout sessions of smaller groups
* PowerPoint presentation
* Instructor’s guide and relevant instructional materials (requires export control and classification reviews)
* Trainee workbook and reference materials
* Course evaluations
* Translation and interpretation
* Site Visit for participants

## Evaluation Strategy

The plan will consist of both formative and summative evaluations using the 4 levels of the Kirkpatrick Model of Evaluation. Levels 1 and 2, or the *Formative Phases*, are conducted during the International Response Training (IRT) Course.

LEVEL 1: Reaction.The extent that participants find the IRT favorable, engaging and relevant to their jobs. This will evaluate how workshop participants react to the workshop by asking questions that capture the trainees’ thoughts. The questions determine if the participants enjoyed the experience and if they found the material in the program useful for their work. This information will be gathered by verbal questions and answers between workshop facilitators and participants and in written form using an ORS standardized Workshop evaluation survey.

Three discussion areas:

* Satisfaction. The extent that participants are satisfied with the training.
* Engagement. The extent that participants are actively involved in and contributing to the learning experience.
* Relevance. The extent that participants will have the opportunity to use and apply the information they learned on the job.

LEVEL 2: Learning.The extent that participants acquire the intended knowledge, skills, attitude, confidence and commitment based on their participation in the IRT.

This evaluation is designed to gauge the level of expertise, knowledge, or mindset that participants have developed. For the international response engagement, the level 2 evaluations should be modified to include:

• Observations by instructors during performance-based exercises

• Knowledge checkpoints throughout presentations and facilitated discussions

Levels 3 and 4, the *Summative Phases* will be conducted after the workshop has been completed. Level 3 and 4 evaluations will require an additional engagement visit to the country 3 to 6 months after the course is delivered.

LEVEL 3: Behavior.The extent that participants apply what they learned during training when they are back on the job. This evaluation will examine how well participants are applying the information received in the IRT. This will be conducted during periodic assurance visits to the sites where the following will be completed:

* Observations
* Checklists
* Surveys

LEVEL 4: Results. This level analyzes the results of the IRT Workshop. Level 4 evaluations should be conducted in person and often are an ongoing process, allowing enough time to measure and evaluate results. Two categories of measurement should be implemented, performance and effectiveness.

• Performance – Has the site implemented:

* Collaboration between first responders and sites
* The use of Site Response Plans, Target Folders, Critical Information cards
* Formalized and reliable alarm notification process

• Effectiveness - Can the site demonstrate:

* Process an alarm properly through the alarm sequence process
* Notify first responders promptly
* The ability to respond in an appropriate time to contain the attempted theft of radiological sources

## Instructors Requirements

Successful execution of this workshop is dependent upon the quality and expertise of its instructors/facilitators. IRT requires three instructors/facilitators who shall be subject matter experts (SME) in their field and possess a mastery of the subject being taught. Two instructors must meet the minimum requirements listed below, the third must have Basic Instructor Training at a minimum. Further, all IRT instructors are required to meet the following qualifications:

Minimum

* Two years of experience working with and completing radiological/nuclear site target folders
* Five years of experience as a local, state, federal law enforcement or nuclear radiological response
* Two years’ experience working with Physical Protection Systems
* Experience with International Training Environments
* Experience of simultaneous and concurrent translation
* Facilitation experience and the ability to adapt to an international training audience

Required

* Basic Instructor Training (BIT) or equivalent

## Prerequisites

No prerequisites required.

# Course Outline

The learning objectives have been written in keeping with the principles in *Guide to Good Practices for Developing Learning Objectives* (DOE-HDBK-1200-97), *Bloom’s Taxonomy, as well as the Appendix to this report on How to Write Instructional Objectives*.

|  |  |
| --- | --- |
| Module One: Course Introduction  Provide participants with an overview of the International Response Training Course. | |
| **Learning Objectives** | **Expected Length** |
| Participants will identify the following:   1. Welcome participants 2. Course purpose and structure 3. Learning outcomes 4. Expectations |  |

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| Module Two: The Office of Radiological Security Overview  **This module is a basic overview of the Office of Radiological Security and its mission.** | |
| **Learning Objectives** | **Expected Length** |
| 1. Identify radiological sources of concern 2. Describe the three primary pillars of the Office of Radiological Security 3. Identify four functions of security enhancements as defined by the Office of Radiological Security |  |
| **Exercises** | **Expected Length** |
| Facilitated Video Discussion |  |

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| Module Three: Radiation Hazards for First Responders  **This module is an overview of radiation, the hazards, and protection strategies for first responders** | |
| **Learning Objectives** | **Expected Length** |
| 1. Describe radiation and hazards associated with exposure and contamination 2. Describe a sealed and unsealed source of radiation 3. Define acute and chronic doses of radiation 4. Understand the effects of radiation on the human body |  |
| **Performance Objective** |  |
| 1. Demonstrate the concepts of time, distance and shielding |  |
| **Exercises** | **Expected Length** |
| Time, Distance and Shielding Exercise |  |

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| Module Four: Threats to Radiological Sources  **This module is an overview and background of the threats to radiological sources and how to document a credible threat in a Threat Assessment** | |
| **Learning Objectives** | **Expected Length** |
| 1. Identify motivations and attributes of those that would pose a threat to the protection of radiological sources 2. Define the tactics, techniques and procedures used by those presenting a threat to radioactive sources 3. Recognize effective detection measures in the protection of radioactive sources 4. Describe the threat of insiders to radioactive material 5. Define a Radiological Dispersal Device 6. Define a Radiological Exposure Device 7. Discuss consequence of a theft of radioactive material |  |
| **Performance Objective** |  |
| 1. Identify an International, Regional and Local threat |  |
| **Exercises** | **Expected Length** |
| Threat Exercise |  |

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| Module Five: Overview of Physical Protection Systems  **Provide participants with an overview of the Physical Protection Systems used for radioactive sources** | |
| **Learning Objectives** | **Expected Length** |
| 1. Identify the three fundamentals of a Physical Protection System 2. Identify characteristics of an effective PPS 3. Identify the detection process associated with the unauthorized access of radiological materials 4. Identify the response sequence when alarms are received 5. Discuss the Physical Protection System Timeline |  |
| **Exercises** | **Expected Length** |
|  |  |

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| Module Six: Overview of Contingency Plans  **Provide the participants the purpose and components of a contingency plan** | |
| **Learning Objectives** | **Expected Length** |
| 1. Define the components of a Contingency Plan 2. Describe the purpose of a Target Folder 3. Describe the critical tasks used in containing the theft of radiological sources |  |
| **Performance Objectives** |  |
| 1. Develop a Site Response Plan based on a facility (actual or hypothetical) |  |
| 1. Develop a Critical Information Card based on a facility (actual or hypothetical) |  |
| **Exercises** | **Expected Length** |
| Site Response Plan and Critical Information Card Exercise |  |

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| Module Seven: Tabletop Exercise  **Provide participants with an overview of the tabletop process** | |
| **Learning Objectives** | **Expected Length** |
| 1. Describe the purpose of a TTX 2. Explain roles and responsibilities of a tabletop exercise 3. Describe a security event and engagement 4. Document TTX activities 5. Demonstrate the TTX Process in a group exercise 6. Determine the results of a TTX |  |
| **Exercises** | **Expected Length** |
| Tabletop Exercise |  |

# Proposed Course Delivery Schedule

| INTERNATIONAL RESPONSE TRAINING EXAMPLE AGENDA  (Times to be modified by the lead instructor based on the country’s needs) | | | |
| --- | --- | --- | --- |
| **Day 1 Monday February 18, 2019** | | | |
| **TIME** | **TOPIC** | | **PRESENTER** |
| 09:00 – 09:30 | Module 1: Course Overview and Introductions | |  |
| 09:30 – 10:00 | Module 2: Office of Radiological Security Program Overview and Summary of Cooperation in Country | |  |
| 10:00 – 10:15 | Coffee & Snack Break | |  |
| 10:15 – 11:15 | Module 3: Hazards of Radiation for First Responders | |  |
| 11:15 – 12:15 | Lunch Break | |  |
| 12:15 – 13:15 | Module 4: The Threat | |  |
| 13:15 – 14:15 | Exercise: Identify an International, National and local threat to radiological material | |  |
| 14:15 – 14:30 | Coffee & Snack Break | |  |
| 14:30 – 15:30 | Module 5: Physical Protection Systems | |  |
| 15:30 – 16:00 | Review with Question and Answer Session | |  |
| **DAY 2 Tuesday February 19, 2019** | | | |
| 09:00 – 9:30 | | Review with Question and Answer Session |  |
| 09:30 – 10:15 | | Module 6: Contingency Plan - Part One (Target Folder) |  |
| 10:15 – 10:30 | | Coffee & Snack Break |  |
| 10:30 – 11:15 | | Module 6: Contingency Plan - Part Two (Site Response Plan) |  |
| 11:15 – 12:15 | | Lunch Break |  |
| 12:15 – 13:30 | | Module 6: Contingency Plan – Critical Information Cards |  |
| 13:30 – 16:00 | | Site Visit (Transportation required for site visit, site TBD) |  |
| **DAY 3 Wednesday February 20,2019** | | | |
| 09:00 – 09:30 | | Review with Question and Answer Session |  |
| 09:30 – 10:15 | | Exercise 1: Develop Site Response Plan |  |
| 10:15 –10:30 | | Coffee & Snack Break |  |
| 10:30 – 11:15 | | Exercise 1: Develop Critical Information Card |  |
| 11:15 – 12:15 | | Lunch |  |
| 12:15 – 14:45 | | Review Site Response Plans and Critical Information Cards |  |
| 14:45 – 15:00 | | Coffee & Snack Break |  |
| 15:00 – 16:00 | | Module 7: Tabletop Exercise |  |
| **DAY 4 Thursday February 21, 2019** | | | |
| 09:00 – 10:15 | | Tabletop Exercise |  |
| 10:15 – 10:30 | | Coffee & Snack Break |  |
| 10:30 – 11:30 | | Tabletop Exercise |  |
| 11:30 – 12:30 | | Lunch Break |  |
| 13:30 – 14:00 | | Graduation and Presentation of Certificates |  |

# Recommendations

Once the IRT Course Design Document is approved by ORS HQ personnel, the IRT development team will revise the existing IRT course implementing the recommended changes.

The new course will reflect the version control identifier IRT version 2.0. The course will be placed on a two-year review cycle to modify as necessary.

## Path Forward

After the revision of the IRT Course review team will continue to explore web-based training options and will provide recommendation to ORS HQ on recommendations.

Project Team

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