

ESSENTIAL ELEMENTS OF NUCLEAR SECURITY INTERNATIONAL SEMINAR

I. OBJECTIVE OF THE SEMINAR

The seminar provides participants with an intense contemporary survey of issues and activities regarding the various aspects of nuclear security. Subject matter includes:

- Nuclear & radiological terrorism – threat, risk, consequences
- International legal framework supporting nuclear security
- Accountancy and control of nuclear and other radioactive material
- Physical protection of nuclear and other radioactive material at sites and in transport
- Illicit trafficking in nuclear and radioactive sources
- Responses to incidents involving nuclear and other radioactive materials
- Instruments for the detection and identification of radionuclides

The seminar will include practical exercises and panel discussions designed to incorporate this knowledge into Member State planning and procedures to protect against threats to nuclear security.

II. OPENING SESSION AND INTRODUCTION TO NUCLEAR SECURITY

1. Welcome to Argonne National Laboratory
2. Welcome on behalf of the International Atomic Energy Agency
3. Goals of the Course
4. Argonne Site Security Briefing
5. Argonne Site Health & Safety Briefing
 - To understand the concepts of radiation safety and the properties of radioactive material and its effects on humans and the environment
6. Introduction of Participants
7. Initial Exercise – Part I
8. Laboratory Tour

III. TRAINING MODULES

MODULE I NUCLEAR AND RADIOLOGICAL TERRORISM – THREAT, RISK, CONSEQUENCES

1. Identifying Nuclear Security Concerns & Combating Nuclear Terrorism

Learning Objectives:

- To understand nuclear security concerns
- To be aware of the historical background why Nuclear Security is important in a country
- To understand the philosophy of Nuclear Security
- To be aware of mechanisms for international cooperation concerning nuclear terrorism

2. *International Perspective on Nuclear and Radiological Security*

Learning Objectives:

- To be aware of guidance for security of radioactive sources
- To understand the physical protection methodology
- To be aware of the relationship of deterrence, detection, delay and response

3. *Proliferation & the Nuclear Fuel Cycle*

Learning Objectives:

- To get an overview of concerns of nuclear security issues related to nuclear fuel cycle
- To understand the basic nuclear fission processes in nuclear reactors and weapons
- To be aware of the use of nuclear material in weapons
- To recognize proliferation sensitive parts of the nuclear fuel cycle
- To recognize terrorist threats and risk of the various parts of the fuel cycle

MODULE II INTERNATIONAL LEGAL INSTRUMENTS

1. *Nuclear Security Regime Objectives and Essential Elements*

Learning Objectives:

- To be aware of and understand the nuclear security principles stated in “ Fundamentals of a States Nuclear Security Regime: Objective & Essential Elements“
- To understand how these principles are applied within a states nuclear security regime

2. *International Legal Instruments for Nuclear Security*

Learning Objectives:

- To be aware of international instruments relevant to the nuclear security and the related obligations for Member States
- To understand which are the relevant binding and non-binding international legal instruments and the resultant obligations for Member States
- To become acquainted with the interpretation of the relevant articles related to nuclear security of the international legal instruments
- To know the status of the legally binding instruments such as conventions, agreements and treaties and the process by which they are developed
- To know the status of the non-binding instruments such as codes of conduct, statements of principle and international standards or technical documents and the process by which they are developed

3. *Legal and Regulatory Infrastructure of Nuclear Security*

Learning Objectives:

- To know the responsibility of different governmental agencies dealing with nuclear and radioactive material
- To be acquainted with regulatory requirements associated with the legal use of nuclear and radioactive material and associated facilities
- To be familiar with the form and content of authorizations issued by such authorities
- To be aware of the means for verifying the valid authorizations
- To be aware of the need for a security component in the authorization process

4. *Roles and Responsibilities of International-Level Law Enforcement Agencies*

Learning Objectives:

- To be aware relationships and interactions of various law enforcement agencies

5. *Nuclear Security Regime Case Study*

Learning Objectives:

- To be aware of the different means to implement Member States' obligations at national level that can impact nuclear security
- To be aware of the necessity to foster relations among and between States and international organizations

MODULE III RISK MANAGEMENT

1. *Understanding Risk Associated with Radiological Threats*

Learning Objectives:

- To introduce the concept of a security risk matrix
- To understand the elements of risk
- To understand the elements of threat

2. *Performing a Threat Assessment & Defining a Design Basis Threat (DBT)*

Learning Objectives:

- To understand how to conduct a national threat assessment
- To understand what a DBT is, why and under what circumstances it is used
- To understand how a DBT is incorporated into a states nuclear security regime

3. *Vulnerability Assessment (VA)*

Learning Objectives:

- To understand what a VA is, why and under what circumstances it is used

4. *Analysis of Strategic Commodity Transfers (Export/Import Control)*

Learning Objectives:

- To be aware of the need of export controls
- To be familiar with the guidelines used by nuclear suppliers (INFCIRC/254, Part 1 and 2)
- To understand the implementation of export controls on strategic goods

5. *Information Security*

Learning Objectives:

- To understand the consequences of cyber-security crimes
- To understand the importance of cyber-security
- To discuss IAEA Guidance on Nuclear Facility Information Security

6. Video – “Countdown to Zero”

MODULE IV PHYSICAL PROTECTION OF NUCLEAR AND OTHER RADIOACTIVE MATERIAL

1. *Physical Protection of Nuclear Materials and Nuclear Facilities (CCCPNM, 225 rev 5)*

Learning Objectives:

- To be aware of the relationship of deterrence, detection, delay and response
- To be aware of requirements & guidance for security of nuclear materials
- To understand the Physical Protection methodology

2. *Security of Radioactive Sources*

Learning Objectives:

- To be aware of Code of Conduct for security of radioactive sources
- To be aware of IAEA guidance (NSS No. 11)

3. *Security and Control of Radioactive Material at Hospitals*

Learning Objectives:

- To be aware of radioactive materials used at hospitals and how this material is controlled.
- To be aware of types of nuclear materials available in hospitals

4. *Legal Shipments of Nuclear & Radioactive Material*

Learning Objectives:

- To be aware of the international transport regulations
- To be aware of current patterns and trends in legal shipments of nuclear and radioactive materials

5. *Video on Safe Transport*

Learning Objectives:

- To be aware of the international requirements for the safe transportation and storage of radioactive material
- To be aware of labelling and packaging of radioactive material

6. *Security of Nuclear and Other Radioactive Materials in Transport*

Learning Objectives:

- To be aware of the transport security principles and practices
- To be aware of radioactive material transport security levels
- To be aware of the measures in the transport of radioactive material

7. *Exercise on Shipment of Radioactive Material*

8. *Overview of U.S. NRC Security Activities*

Learning Objectives:

- To provide an example of an organizational structure of a nuclear regulator
- To provide an example of how security measures can be implemented at commercial plants

9. *Overview of Security Activities: Guest Country Presentation*

10. *Country Presentations - Participants*

MODULE V ACCOUNTANCY AND CONTROL OF NUCLEAR AND OTHER RADIOACTIVE MATERIAL

1. *International Safeguards*

Learning Objectives:

- To understand the Nuclear Non-Proliferation Regime
- To be aware of the technical objectives of IAEA Safeguards
- To know the limitation of traditional Safeguards
- To be aware of Integrated Safeguards

2. *Accountancy and Control (MC&A)*

Learning Objectives:

- To understand the role of the MC&A
- To be aware of the MC&A technical requirements
- To be aware of the IAEA & state requirements for MC&A
- To understand the critical steps in establishing a MC&A system

3. *Additional Protocol to Safeguards Agreements*

Learning Objectives:

- To understand the main components of strengthened safeguards system
- To understand the advantages of integrated safeguards

4. *Exercise on Missing Nuclear Material at a Facility*

MODULE VI DETECTION

1. *Radiation Detection Fundamentals*

Learning Objectives:

- To understand the basics of ionizing radiation (gamma ray and neutron)
- To understand the difference between natural and man-made radiation sources
- To introduce the basics of radiation detection

2. *Radiation Detection Systems*

Learning Objectives:

- To be aware of the capabilities of technology
- To be aware of the border radiation detection equipment to detect, localize and identify nuclear and other radioactive material
- To understand the basic operational functions of commercially available portable detection instruments in the field

3. *Monitoring, Detecting and Measuring Equipment*

Learning Objectives:

- To be aware of the border radiation detection equipment to detect, localize and identify nuclear and other radioactive material
- To understand the basic operational functions of commercially available portable detection instruments in the field

4. *Nuclear Security Framework for Major Public Events (MPE)*

Learning Objectives:

- To understand the concept of designing nuclear security measures for MPE
- To be aware of capabilities for detection, interdiction and response to malicious acts involving nuclear or other radioactive materials at major public events

MODULE VII NUCLEAR & RADIOACTIVE MATERIAL OUT OF REGULATORY CONTROL

1. *Assessment of Nuclear Security Events at Borders*

Learning Objectives:

- To understand the process at borders (initial & secondary screening) to adjudicate alarms

- To understand the necessity of technical evaluation (reach-back)
- To understand the roles and responsibilities of various national law enforcement agencies and technical communities
- To understand the procedures in place to handle incidents involving nuclear and other radioactive materials

2. *Illicit Trafficking Data Base System:*

Learning Objectives:

- To be aware of the structure and operations of the ITDB System
- To be aware of the current and past trends and patterns of illicit trafficking and other unauthorized activities involving nuclear and radioactive materials and of selected incidents of the highest concern
- To understand the need and procedures for the exchange of information on such events both among States and with the IAEA.

3. *Illicit Trafficking Incidents: Some Case Studies*

Learning Objectives:

- To provide examples of incidents of illicit trafficking involving nuclear or other radioactive material that have occurred in the past
- To show how these cases have been processed

4. *The Role of Customs in Border Protection*

Learning Objectives:

- To become familiar with the responsibilities of Customs Enforcement in combating nuclear terrorism
- To understand the importance of fixed points and “Green” border protection
- To understand Custom’s role in responding to incidents involving nuclear or other radioactive material

5. *Security Concerns for Radioactive Material & Border Security*

Learning Objectives:

- To understand the concept of Second Line of Defence – Border Protection
- To understand detection systems used at borders

6. *Video – “IAEA Watchdogs”*

MODULE VIII RESPONSE TO INCIDENTS INVOLVING NUCLEAR AND OTHER RADIOACTIVE MATERIAL

1. *Response to Criminal or Unauthorized Acts Involving Nuclear & Radioactive Material*

Learning Objectives:

- To raise awareness of the participants to the need for planning in advance to react to criminal or unauthorized acts involving nuclear and other radioactive material
- To clarify and confirm roles and responsibilities of responding organizations

2. *Overview of Radiological Crime Scene Response*

Learning Objectives:

- To enhance awareness of capabilities for radiological crime scene response
- To understand the fundamentals of crime scene management

3. *Introduction to Nuclear Forensic*

Learning Objectives:

- To understand difference between classical and nuclear forensics
- To know about the elements of a nuclear forensics capability
- To be aware of the procedures for obtaining nuclear forensics support from ITWG Nuclear Forensics Laboratories

4. *In-field Experiences*

Learning Objectives:

- To raise awareness of lessons learned from real cases
- To stress the importance of coordination among organizations
- To understand the importance of the Media
- To understand the importance of public perception
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5. *Exercise on Illegal Nuclear Material Discovered by Police*

6. *Emergency Medical Response Planning to Incidents Involving Nuclear or other Radioactive Material*

Learning Objectives:

- To identify levels of nuclear-related triage and procedures used in treating those patients
- To identify procedures in place to handle significant nuclear-related triage at Loyola University Medical Centre
- To recognize emergency response (nuclear related) training requirements and emergency response exercises and certification of staff at Loyola
- To understand the Loyola's role in city-wide or state-wide emergency disasters

7. *Methods for Emergency Response to Incidents Involving Nuclear or other Radioactive Material*

Learning Objectives:

- To be aware of the different approaches to respond to nuclear, radiological incidents vs. major trauma incidents, (i.e., necessary equipment contamination concerns, treatment, etc.)

8. *Video on Emergency Response/Methods of Emergency Response to Incidents Involving Nuclear or other Radioactive Material*

Learning Objectives:

- To understand the various methods of emergency response to nuclear-related incidents, based on various levels of triage
- To be aware of emergency medical services and hazmat procedures for responding to triage
- To define decontamination process utilized for hazmat response as it relates to triage

9. *Initial Exercise – Part II*

10. *Tour to ANL Fire Dept and Radiological Equipment*

Learning Objectives:

- To observe the variety of emergency response measures and equipment

11. *Initial Exercise – Part III*

MODULE IX FINAL EXERCISE: RESPONSE TO AN INCIDENT INVOLVING NUCLEAR OR OTHER RADIOACTIVE MATERIAL

1. *Exercise*

Learning Objectives:

- To get familiar with measures to deter and respond respectively to incidents involving nuclear or other radioactive material

2. *Small Group Presentations*

MODULE X CLOSING REMARKS

1. *IAEA Assistance Programs Related to the Nuclear Security*

Learning Objectives:

- To be aware of the IAEA support related to Nuclear Security (including i.e. training support, advisory services, technical support, recommendations and nuclear security guidelines, nuclear security series)
- To understand the three main areas for the 2006-2009 timeframe
- To be aware of the Integrated Nuclear Security Support Plan (INSSP)