IAEA Workshop
EBP on Nuclear Installation and Safety – Asian Countries

Emergency Preparedness and Response for Research Reactors

29 April – 3 May 2002
Daejon, Korea

WORKSHOP MANUAL

Prepared/Modified: 28/02/2002

INTERNATIONAL ATOMIC ENERGY AGENCY IAEA

CONTENT

WORKSHOP PLAN

Aims and objectives of the workshop

The main aims of the workshop are to provide the participants with the knowledge and tools to be able:

(a) To develop and implement an action plan to establish the capability to respond to emergencies at their research reactors, and
(b) To develop plans and procedures to respond in case of emergencies at research reactors.

Upon completion of the workshop participating countries will commit to develop and implement an action plan to establish the capability to respond to emergencies at their research reactors consistent with IAEA guidance.

Learning objectives are as follows. By the end of the workshop, the participants will:

⇒ Understand the risk of emergencies at research reactors and their potential consequences
⇒ Understand the basic concepts of emergency preparedness and response, including objectives of emergency response and preparedness, emergency planning categories, planning areas and zones, planning levels and responsibilities, emergency classes, conditions and immediate actions, and integrated planning concepts
⇒ Understand the step-by-step approach to developing and implementing emergency response plans
⇒ Be able to identify critical tasks and recognize the need for their assignment
⇒ Be able to describe a simple concept of operations for emergency preparedness for research reactors
⇒ Know the infrastructure and functional elements of a response capability for emergency planning for research reactors
⇒ Understand how to treat injured and exposed personal
⇒ Be able to:
    ⇒ Classify an emergency
    ⇒ Make appropriate off-site notifications
    ⇒ Take appropriate actions to protect on-site staff
    ⇒ Implement appropriate off-site protective actions
    ⇒ Provide timely and informative information to the public
    ⇒ Make appropriate international notifications and request assistance from IAEA
⇒ Be familiar with IAEA documents that can be used in developing an emergency response capability to include:
    ⇒ TECDOC-953 "Method for the development of emergency response preparedness for nuclear or radiological accidents"
    ⇒ TECDOC 955 “Generic procedures for assessment and response during a nuclear reactor emergency”
    ⇒ TECDOC 1162 “Generic procedures for assessment and response during a radiological emergency”
    ⇒ TECDOC-1092 “Generic Procedures for monitoring in a nuclear or radiological emergency.
⇒ Know the means by which the IAEA can assist in development of national capabilities

Intended countries

The workshop is intended for Asian countries with research reactors but without emergency response capabilities consistent with IAEA guidance.

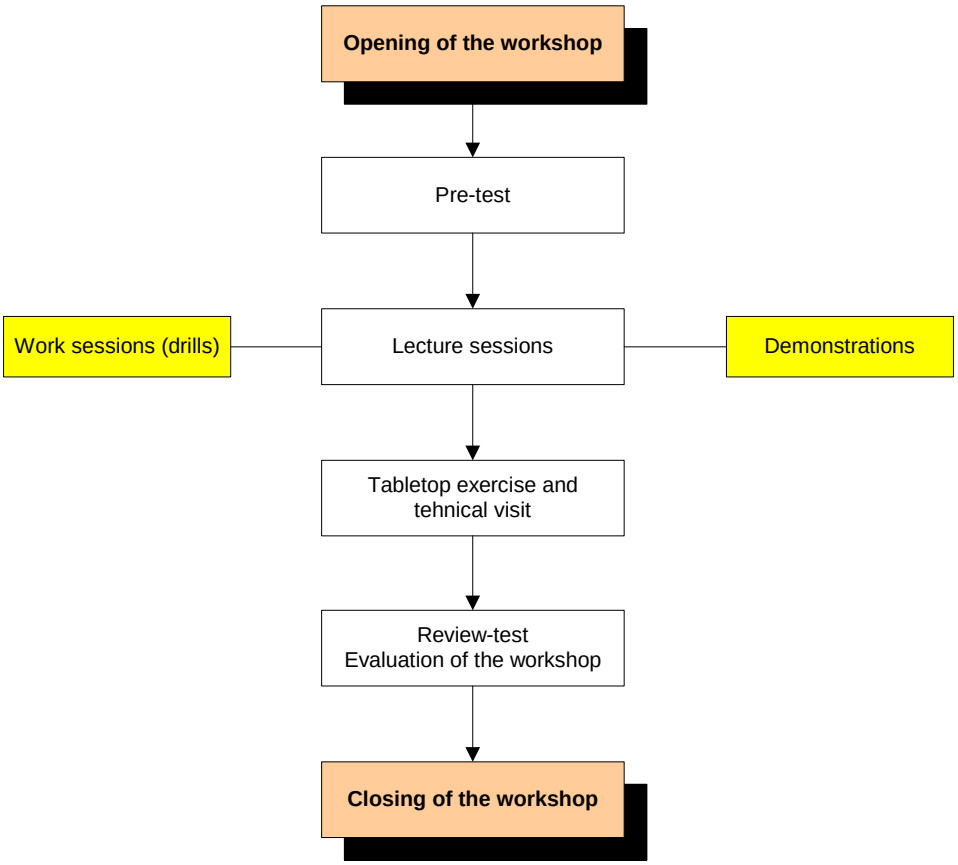
Participants

Contries wanting to participate in the workshop should nominate a team of proposed participants composed of (as appropriate):

1. A regulator responsible for emergency preparedness at research reactors,
2. A member of the research reactors staffed familiar with its operations and who is responsible for facility emergency response, and
3. A member of the research facility or local jurisdiction containing the research reactor who is responsible off-site response.

Workshop structure

The workshop will be held for 5 working days and it is structured in the following way:



WORKSHOP SYLLABUS

The workshop syllabus has a modular structure. It is divided into parts, modules and lessons. *Part* is a generic term to describe main blocks of training. It is built of modules. The term *module* is used to describe a specific narrow block of training. Modules are further divided into learning units – *lessons*. Lesson can be a lecture, exercise, technical visit, video presentation, assessment session or any combination of these activities. The workshop syllabus follows the structure of IAEA Standard Syllabus for training in emergency preparedness and response.

BLOCK A Training Administration

PART I OPENING AND CLOSING SESSIONS
Modules
I1 Opening
- I1_1 Registration session
- I1_2 Formal opening session
- I1_3 Training information session

I2 Closing
- I2_1 Closing session

BLOCK B – Lecture Sessions

PART II BACKGROUND
Modules
II1 Overview of radiation emergencies
Lessons
- II1_3 Emergencies at research reactors

II2 Cases of radiation emergencies
Lessons
- II2_5 Tokaimura (Japan) accident and lessons learned
- II2_6 Ulsan (Korea) accident and lessons learned

II3 Review of fundamentals
Lessons
- II3_8 Non-radiological safety

PART III DEVELOPMENT OF EMERGENCY RESPONSE PREPAREDNESS
Modules
III1 Principles and requirements
Lessons
- III1_1 Goals of emergency preparedness and response
- III1_2 Basic principles and requirements for emergency preparedness and response

III2 Establishing emergency response capability
Lessons
- III2_1 Basic concepts and responsibilities
- III2_2 Step-by-step approach to developing response capability
- III2_6 Emergency plans and procedures
- III2_10 Emergency preparedness and response aspects for research reactors

PART IV EMERGENCY RESPONSE

Modules
IV2 Radiological emergencies
Lessons
IV2_2 Emergency management

IV3 Radiation emergencies – common features
Lessons
IV3_2 Exposure pathways and protective actions
IV3_3 Protecting emergency workers
IV3_5 Instructing, warning and informing the public

IV4 Communication with the media and the public
Lessons
IV4_7 Incident reporting systems and International Nuclear Event Scale (INES)

PART V RADIATION EMERGENCY ASSESSMENT
Modules
V1 Emergency monitoring
Lessons
V1_1 Emergency monitoring overview

PART VI MEDICAL AND PUBLIC HEALTH PREPAREDNESS AND RESPONSE
Modules
VI1 Medical and public health preparedness
Lessons
VI1_1 Medical preparedness for radiation emergencies - overview

VI3 Emergency medical response
Lessons
VI3_2 On-scene (pre-hospital level) emergency medical response

PART VII TRAINING
Modules
VII1 Developing and implementing training programme
Lessons
VII1_4 Development and implementation of an action plan

PART VIII INTERNATIONAL CO-OPERATION IN AN EMERGENCY
Modules
VIII2 Emergency assistance
Lessons
VIII2_1 Capabilities of Emergency Response Centre at IAEA

PART IX TRAINING SPECIFIC LESSONS
Lessons
SP_1 Emergency Response Centres in the region (Japan, Korea and China)

BLOCK C – Practical Sessions

PART EX EXERCISES

Demonstrations

V2D_2 Personal and equipment contamination monitoring
VI3D_1 Handling of contaminated patients

Work sessions (drills)

III2W_2 Identification and assignment of critical tasks
VIII2W_1 How to request IAEA's assistance

Tabletop exercises

IV2T_2 Emergency at research reactor facility

PART TV TECHNICAL VISITS

TV_3 Visit to Emergency Response Centre in KINS (joint with the tabletop exercise)

PART AS ASSESSMENT SESSIONS

AS1 Pre-tests

AS1_7 Pre-test for Training Event No-7

AS2 Review-tests

AS2_7 Review-test for Training Event No-7

AS4 Training evaluations

AS4_1 Participant's evaluation of training

Summary of activities

Sessions	Duration [hrs]
Opening and closing	3
Lectures	20
Exercises	7
Demonstrations	2
Work sessions (drills)	1
Tabletop exercise	4
Assessment	2
Sum	**32**

LECTURE PLAN

BLOCK A Workshop Administration

I1_1 Lesson	**Registration session**
Purpose	To register participants To distribute training and other materials and identity badges
Duration [hrs]	1
Resources	Appropriately prepared classroom, training and other materials, identity badges
I1_2 Lesson	**Formal opening session**
Purpose	To welcome guests and participants To declare the workshop opened
Learning objectives	To feel welcomed by the IAEA and by the host country To be aware of Agency's expectations of the participants To feel inspired to learn, ask questions, and make contacts
Content	Welcome addresses General introduction to the training Agency's expectations of the participants
Duration [hrs]	½
Training material	None
References	None
Resources	Appropriately prepared and equipped lecture room for 30 participants and guests
I1_3 Lesson	**Training information session Presentation/Discussion**
Purpose	To present basic information (training aims, training plan, training programme, training material, administration and logistic arrangements) To check if all training material is available
Learning objectives	To know the training aims To be informed on the training plan To be familiar with the training administration and logistic arrangements To be informed on training material received To get to know other participants – participants introduce themselves
Content	Aims of the training within the overall framework of emergency preparedness development Training plan and programme Training administration and logistic arrangements (inc. food, travel, accommodation, payments, social events, etc.) Self introduction of the participants
Duration [hrs]	½
Training material	Programme, list of participants, checklist for training administration and logistic arrangements
References	None
Resources	Computer projector, overhead projector, screen, PC, PowerPoint 2000®
I2_1 Lesson	**Formal closing session**
Purpose	To deliver closing addresses To deliver certificates of attendance To close the training
Learning objectives	To be encouraged to continue activities started at the training
Content	Closing addresses by host country and IAEA representative Presenting training Certificates
Duration [hrs]	1
Training material	None
References	None
Resources	Training Certificates

BLOCK B Lecture Sessions

II1_3 Lesson	**Emergencies at research reactors** **L**
Purpose	To present and explain the types and hazards of emergencies at research reactors and their potential consequences based on past emergencies
Learning objectives	To be able to list types of potential radiological emergencies at research reactors To know examples of reactor and facility set-ups that can give rise to such accident To learn experiences in response to emergencies at research reactors To be able to list main consequences of these emergencies To be able to list principle lessons learned
Content	Basic safety requirements for EP at RR Major emergency initiating events Accident history and statistics Examples of actual emergencies at research reactors Lessons learned from response to past emergencies
Duration [hrs]	1
Training material	Lecture notes for Lesson II1_3
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Safety standards for research reactor safety in operation, SS-35-S2 INTERNATIONAL ATOMIC ENERGY AGENCY, Incident Reporting System for Research Reactors (IRSRR), Working Material, IAEA, November 2000 INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Requirements, IAEA, Vienna (under preparation)
Resources	Computer projector, screen, PC, PowerPoint 2000®
II2_5 Lesson	**Tokaimura (Japan) accident and lessons learned**
Purpose	To present and explain the event history, causes and consequences of Tokaimura accident To summarise lessons learned
Learning objectives	To know what happened in this radiological accident To be able to list causes and main consequences of this accident To know and to be able to list principal lessons learned
Content	Background (facility) Event history Response Causes and consequences Lessons to be learned
Duration [hrs]	½
Training material	Lecture notes for Lesson II2_5
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Report on the preliminary fact finding mission following the accident at the nuclear fuel processing facility in Tokaimura, Japan, IAEA, Vienna (1999)
Resources	Computer projector, screen, PC, PowerPoint 2000®
II2_6 Lesson	**Ulsan (Korea) accident and lessons learned**
Purpose	To present and explain the event history, causes and consequences of Ulsan accident To summarise lessons learned
Learning objectives	To know what happened in this radiological accident To be able to list causes and main consequences of this accident To know and to be able to list principal lessons learned
Content	Background (facility) Event history Response Causes and consequences Lessons to be learned
Duration [hrs]	½
Training material	Lecture notes for Lesson II2_6
References	Add references
Resources	Computer projector, screen, PC, PowerPoint 2000®
II3_8 Lesson	**Non-radiological safety** **L**
Purpose	To present and discuss non-radiological safety issues at nuclear facilities in general and

	specifically at research reactors
Learning objectives	To be aware importance of non-radiological safety systems at nuclear facilities To know non-radiological safety systems and their importance for overall safety of nuclear facilities To be aware of potential initiating non-radiological events that may trigger radiation emergencies
Content	Physical protection systems Fire protection systems Water flow safety systems Electrical supply systems Civil engineering issues Hazardous materials
Duration [hrs]	1
Training material	Lecture notes for Lesson II1_3
References	INTERNATIONAL ATOMIC ENERGY AGENCY, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115, IAEA, Vienna (1996) INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Requirements for Research Reactors, IAEA Draft DS 272 (2001)
Resources	Computer projector, screen, PC, PowerPoint 2000®
III1_1 Lesson	**Goals of emergency preparedness and response L**
Purpose	To present and explain primary goals and practical objectives of emergency preparedness and response to radiation emergencies
Learning objectives	To be able to list emergency preparedness goals and emergency response objectives To understand why emergency plans are developed and how much planning is required To be aware of post-emergency preparedness and response goals
Content	Goals of emergency response Why plan and preparedness? Planning objectives Response objectives Post-emergency preparedness and response goals
Duration [hrs]	1
Training material	Lecture notes for Lesson III1_1
References	INTERNATIONAL ATOMIC ENERGY AGENCY, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115, IAEA, Vienna (1996) INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, Principles for Intervention for Protection of the Public in a Radiological Emergency, Publication No. 63, Pergamon Press, Oxford and New York (1993) INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Standards Series No. GS-R-2, Vienna (2002)
Resources	Computer projector, screen, PC, PowerPoint 2000®
III1_2 Lesson	**Basic principles and requirements L**
Purpose	To present and explain framework of emergency preparedness and response system
Learning objectives	To know the difference between the systems of radiation protection for practices and interventions To understand the concept of avertable dose and the concept of intervention levels To know basic principles and requirements for emergency preparedness and response To understand concept of threat assessment
Content	Interventions vs. practices Basic responsibilities Intervention principles Threat assessment Threat categories
Duration [hrs]	1
Training material	Lecture notes for Lesson III1_2
References	INTERNATIONAL ATOMIC ENERGY AGENCY, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115, Vienna (1996) INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a

	Nuclear or Radiological Emergency, Safety Standards Series No. GS-R-2, Vienna (2002) INTERNATIONAL COMMISSION ON RADIATION PROTECTION, Principles for Intervention for Protection of the Public in a Radiological Emergency, ICRP Publication 63, Annals of the ICRP Vol.22 NO. 4, Oxford (1993)
Resources	Computer projector, screen, PC, PowerPoint 2000®
III2_1 Lesson	**Basic concepts and responsibilities L**
Purpose	To explain basic concepts and responsibilities in establishing emergency response capability
Learning objectives	To understand planning areas and zones To become aware of planning levels and responsibilities To know emergency classes and conditions To understand the importance of integrated planning concept
Content	Practical goals of emergency response and threat categories Planning areas and zones Planning levels and responsibilities Emergency classes and conditions Functions and infrastructure Integrated planning concept
Duration [hrs]	1
Training material	Lecture notes for Lesson III2_1
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002) INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Standards Series No. GS-R-2, Vienna (2002)
Resources	Computer projector, screen, PC, PowerPoint 2000®
III2_2 Lesson	**Step-by-step approach to developing response capability L**
Purpose	To explain the main features of the methodology for developing response capability
Learning objectives	To understand that developing a national capability requires a systematic approach To know that this process is modular, requires extensive consultation with all relevant organizations and that it is iterativeTo unerstand and learn a ten-step process To be aware of implementing considerations
Content	Main features of the planning methodology Getting started Ten steps (tasks)
Duration [hrs]	1
Training material	Lecture notes for Lesson III2_2
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002) INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Standards Series No. GS-R-2, Vienna (2002)
Resources	Computer projector, screen, PC, PowerPoint 2000®
III2_6 Lesson	**Emergency plans and procedures L**
Purpose	To explain and discuss structures of emergency plans and supporting implementing procedures
Learning objectives	To know the objective of writing an emergency planTo understand the importance of integrated planning To know the principal components of emergency plans and procedures To be acquainted with the emergency plan's outline To understand the process of developing and writing an implementing procedure To be aware of QA elements in developing emergency plan and procedures
Content	All hazard emergency plan National Radiation Emergency Plan (NREP) outline Implementing procedure outline
Duration [hrs]	1
Training material	Lecture notes for Lesson III2_6
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002)

Resources	Computer projector, screen, PC, PowerPoint 2000®
III2_10 Lesson	**Emergency preparedness and response aspects for research reactors L**
Purpose	To explain and discuss how principles and concepts of emergency preparedness and response apply to research reactors
Learning objectives	To know the basic requirements for radiation protection at research reactors To understand threat assessment process for research reactors To be able to list possible emergencies at research reactors To be acquainted with the response strategy
Content	Radiation protection at research reactor facilitiesResearch reactor planning needsThreat assessment for research reactorsNeeds analysis and response strategy
Duration [hrs]	1
Training material	Lecture notes for Lesson III2_10
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002)
Resources	Computer projector, screen, PC, PowerPoint 2000®
IV2_2 Lesson	**Emergency management L**
Purpose	To explain and discuss concepts and functions of emergency management
Learning objectives	To know basic concept and functions of emergency management To become aware of emergency mitigation process and measures To know the concept of operations for the initial response To be able to list the responsibilities and main tasks of Emergency Manager
Content	Basic concepts of accident management Emergency management role Emergency Manager's tasks Emergency phase actions Post-emergency phase actions
Duration [hrs]	1
Training material	Lecture notes for Lesson IV2_2
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Assessment and Response during a Radiological Emergency, IAEA-TECDOC-1162, Vienna (2000)
Resources	Computer projector, screen, PC, PowerPoint 2000®
IV3_2 Lesson	**Exposure pathways and protective actions L**
Purpose	To explain and discuss exposure pathways in radiation emergency and to summarise possible protective actions and their characteristics
Learning objectives	To know exposure pathways in nuclear or radiological accident To be able to list the elements of a protective action decision making strategy To be able to list (urgent) protective actions To know the characteristics of specific (urgent) protective actions To understand the role of intervention and operational intervention levels
Content	Exposure pathwaysProtection strategy Urgent protective actions Operational Intervention Levels
Duration [hrs]	1
Training material	Lecture notes for Lesson IV3_2
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Intervention Criteria in a Nuclear or Radiation Emergency, Safety Series No. 109, Vienna (1994) INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002) INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA, Vienna (1997)
Resources	Computer projector, screen, PC, PowerPoint 2000®
IV3_3 Lesson	**Protecting emergency workers L**
Purpose	To explain and discuss system, guides and equipment for protection of workers undertaken interventions (emergency workers)
Learning objectives	To be aware of requirements regarding protection of emergency workers To know principles of radiation protection in an emergency

	To be able to recognize/identify hazardous situation in responding to radiation emergencies To know basic personal protection equipment To be able to list personal protection guides
Content	Requirements regarding protection of emergency workers Principles of radiation protection in an emergency Personal protection guides and instructions Personal protective equipment Protection from non-radiological hazards
Duration [hrs]	1
Training material	Lecture notes for Lesson IV3_3
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Monitoring in a Nuclear or Radiological Emergency, IAEA-TECDOC-1092, IAEA, Vienna (1999)INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA, Vienna (1997)INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Assessment and Response during a Radiological Emergency, IAEA-TECDOC-1162, IAEA, Vienna (2000)
Resources	Computer projector, screen, PC, PowerPoint 2000®
IV3_5 Lesson	**Instructing, warning and informing the public L**
Purpose	To summarise the importance of communication with the media and the public in an emergency and to summarise communication principles and guides
Learning objectives	To know why it is important to communicate with the media and the publicTo know the basic ways of communication with the media and the public in an emergencyTo be able to determine when and about what to informTo become aware of basic principles of communicationTo be familiar with the communication methods and means
Content	Why to inform the public? How to communicate with the public? Basic communication principles Working with the media (dedia outlets, media operations, media interview, media Briefing/Interview Planning Worksheet) The press release/news statements Benefits of good media communications
Duration [hrs]	1
Training material	Lecture notes for Lesson IV3_2, Media Briefing/Interview Planner Worksheet
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Communications on nuclear, radiation, transport and waste safety: a practical handbook, IAEA-TECDOC-1076, Vienna (1999)
Resources	Computer projector, screen, PC, PowerPoint 2000®
IV4_7 Lesson	**Incident reporting systems and International Nuclear Event Scale (INES) L**
Purpose	To present and explain International Nuclear Event Scale (INES) together with other reporting systems
Learning objectives	To be aware of different radiation events reporting systems To understand and know scale criteria and safety attributes
Content	Incident Reporting System (IRS) Incident Reporting System for Research Reactors (IRSRR) International Nuclear Event Scale (INES) Nuclear Events Web-based System (NEWS)
Duration [hrs]	1
Training material	Lecture notes for Lesson IV4_7
References	Add references
Resources	Computer projector, screen, PC, PowerPoint 2000®
V1_1 Lesson	**Emergency monitoring overview L**
Purpose	To give an overview of objectives, strategy and organisation of radiation monitoring in an emergency
Learning objectives	To be able to list the objectives of emergency monitoring To understand generic emergency monitoring organisation To be able to describe emergency monitoring and sampling strategy To be able to determine staff qualification requirements To know basic survey methods

	To comprehend the QA and QC systems in emergency monitoring and sampling
Content	Objectives of emergency monitoring Generic monitoring organization Emergency monitoring strategy Emergency monitoring staff Instrumentation, basic survey methods Quality assurance system
Duration [hrs]	1
Training material	Lecture notes for Lesson V1_1
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Monitoring in a Nuclear or Radiological Emergency, IAEA-TECDOC-1092, IAEA, Vienna (1999)
Resources	Computer projector, screen, PC, PowerPoint 2000®
VI1_1 Lesson	**Medical preparedness for radiation emergencies - overview L**
Purpose	To summarise facts about ionising radiation and effects on human and to explain medical aspects of radiation emergency To give an overview of elements for medical emergency preparedness and response in radiation emergency
Learning objectives	To be able to recall health effects of radiationTo be aware of the importance of medical and psychological effects of radiation emergencies To understand the role and place of medical response (medical specialists) in the overall organizational emergency response structureTo be able to list infrastructure and functional requirements for medical response preparedness
Content	Ionising radiation, health effects of radiation: description, examples Medical and psychological aspects of radiation emergencies Medical response as a part of the overall emergency preparedness and response Infrastructure and functional requirements for medical preparedness
Duration [hrs]	1
Training material	Lecture notes for Lesson VI1_1
References	UNSCEAR, Sources and Effects of Ionizing Radiation, 2000 Report to the General Assembly with Scientific Annexes, United Nations, New York (2000) Ricks, R.C., Prehospital Management of Radiation Accidents, ORAU 223, Oak Ridge Associated Universities, Oak Ridge, TN, 1984 Medical management of radiological casualties, Handbook, Ed. D. Jarrett., AFRRI, Bethesda, MD, 1999
Resources	Computer projector, screen, PC, PowerPoint 2000®
VI3_2 Lesson	**On-scene (pre-hospital level) emergency medical response L**
Purpose	To explain and discuss the functions of emergency medical responders on-scene (at pre-hospital level)
Learning objectives	To know what actions should be taken on-scene until arrival of the Emergency Medical Responders To know the role and tasks of Emergency Medical RespondersTo understand the interactions between different response groups on-scene To know the basic steps in contaminated casualty handling on-scene To be aware of interactions and needed coordination between different response groups on-scene To be acquainted with basic process of medical and radiological triage To know the procedure of transporting the victims to the hospital
Content	Immediate actions to be taken on-scene until arrival of the Emergency Medical Responders Role and tasks of the Emergency Medical Responders on-scene (at pre-hospital level) Interactions and needed coordination between different response groups on-scene Basic scheme of medical and radiological triage Basic steps for contaminated casualty handling and preparation of a contaminated victim to be transported to the hospital Procedure of transporting the victims to the hospital
Duration [hrs]	1
Training material	Lecture notes for Lesson VI3_2
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Assessing and Response during a Radiological Emergency, IAEA-TECDOC-1162, IAEA, Vienna, 2000

	INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Medical Response during Radiation Emergency, IAEA-TECDOC-xx, IAEA, Vienna (2002, in preparation) Ricks, R.C., Pre-hospital Management of Radiation Accidents, ORAU 223, Oak Ridge Associated Universities, Oak Ridge, TN, 1984. Medical management of radiological casualties. Handbook. Ed. D. Jarrett., AFRRI, Bethesda, MD, 1999
Resources	Computer projector, screen, PC, PowerPoint 2000®
VII1_4 Lesson	**Development and implementation of an action plan** **L**
Purpose	To explain and discuss basic project management principles and tools
Learning objectives	To understand basic project management principles To know what a project management plan should contain To be familiar with the project management process To understand the needs to developing an action plan
Content	What is an action plan? Project management fundamentals: what is project management; project management contents; project management process Generic action plan
Duration [hrs]	1
Training material	Lecture notes for Lesson VII1_4
References	Add references
Resources	Computer projector, screen, PC, PowerPoint 2000®
VIII2_1 Lesson	**Capabilities of Emergency Response Centre at IAEA** **L**
Purpose	To present authorities, roles, responsibilities and capabilities of IAEA ERC and explain tasks and procedures for requesting its assistance in case of radiation emergency
Learning objectives	To be aware of the authorities, roles, responsibilities and capabilities of IAEA ERC To be aware of required (established) communication links To know procedures for requesting ERC assistance
Content	Authorities, roles and responsibilities Capabilities and response preparedness Concept of operations and communication links Procedures for requesting ERC assistance
Duration [hrs]	1
Training material	Lecture notes for Lesson VIII2_1
References	INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Notifications and Assistance Technical Operations Manual, Emergency Preparedness and Response Series EPR-ENATOM, IAEA (2000) INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Communications with the IAEA Emergency Response Centre, Emergency Preparedness and Response Series EPR-ENATOM 2000, IAEA, Vienna (2000)
Resources	Computer projector, screen, PC, PowerPoint 2000®
SP_1 Korea 2002	**Emergency Response Centres in the region (Japan, Korea and China)** **L**
Purpose	To present and explain roles, functions, responsibilities and capabilities of region emergency response centres
Learning objectives	To be aware of the authorities, roles, responsibilities and capabilities of regional emergency centres
Content	Authorities, roles and responsibilities Capabilities and response preparedness Concept of operations and communication links
Duration [hrs]	1
Training material	Lecture notes for Lesson SP_1 Korea 2002
References	Add references
Resources	Computer projector, screen, PC, PowerPoint 2000®

BLOCK C Practical Sessions

Demonstrations

V2D_2 Lesson	**Personal and equipment contamination monitoring** **EX**
Purpose	To explain and demonstrate personal monitoring techniques
Learning objectives	To be prepared: to use personal monitoring equipment properly, to use personal monitoring technique (Frisking technique) properly, to perform radiological survey of victim on-scene and at the hospital, to perform monitoring of seriously injured victim(s), wounds, and body orifices, and to report monitoring results on appropriate worksheets
Demonstration tasks	Quality control check and proper use of personal monitoring equipment Setting dose and dose rate alarms Monitoring of victims with different types of injury Monitoring wounds and body orifices Reporting results of contamination control
Duration [hrs]	1
Training material	Instructions for Lesson V2D_2, worksheets
Resources	Gamma dose rate and contamination monitors, check sources, basic personal protection equipment, casualty simulation kit
VI3D_1 Lesson	**Handling of contaminated patients** **EX**
Purpose	To demonstrate proper handling of contaminated casualties on-scene (at pre-hospital level)
Learning objectives	To be prepared to handle contaminated victims on-scene (at pre-hospital level) To understand the priority of actions while handling the injured person with contamination To know how to prevent the spread of contamination
Demonstration tasks	Medical triage of victims on-scene Relocation of victim from contaminated (endangered) area Prevention of spreading the contamination Preparation of victim and the ambulance for transfer to the hospital
Duration [hrs]	1
Training material	Instructions for Lesson VI3D_1
Resources	Protective overalls, overshoes and gloves, plastic cover for preventing spread of contamination, stretcher, casualty simulation kit, medical transportation vehicle, basic radiation and contamination monitoring equipment

Works sessions (drills)

III2W_2 Lesson	**Identification and assignment of critical tasks** **EX**
Purpose	To give participants opportunity to review and complete the table of critical tasks according to the situation in their countries
Learning objectives	To become familiar with one of the steps in developing sound emergency preparedness To identify possible gaps or overlaps in assignments To learn what assignments remain to be clarified and agreed upon
Tasks	To determine the relevant threat categories in the country using IAEA-TECDOC-953 To review the critical tasks according to determined threat category To identify the responsible organisation for each task according to the situation in the country
Duration [hrs]	1
Training material	Instructions for Lesson III2W_2, worksheet
Resources	INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002)
VIII2W_1 Lesson	**How to request IAEA's assistance**
Purpose	To explain the procedure for requesting the IAEA's assistance To present most common errors in requesting IAEA's assistance To practise writing a request for IAEA's assistance
Learning objectives	To be familiar and to know the procedure for requesting IAEA's assistance from ERC

Tasks	To write a request for IAEA's assistance in selected emergency situations
Duration [hrs]	½
Training material	Instructions for Lesson VIII2W_1
Resources	INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Communications with the IAEA Emergency Response Centre, Emergency Preparedness and Response Series EPR-ENATOM 2000, IAEA, Vienna (2000)

Tabletop exercise

IV2T_2 Lesson	**Emergency at research reactor facility EX**
Purpose/Exercise objectives	To verify the ability of the exercise emergency response organization to perform the following response functions: activate promptly, take immediate actions to protect on-site personnel, take appropriate mitigating actions, assess the off-site impacts, make recommendations to and communicate effectively with off-site authorities, make appropriate decisions regarding media communications
Learning objectives	To get familiar with the practical aspects of emergency assessment and decision-making To experience the concepts of emergency response and needed coordination between on-site and off-site response To experience media communication
Scenario/Tasks	Irradiated tellurium dioxide case rupture inside the reactor pool irradiation channel To discuss and make decisions on mitigation actions, initial on-site and off-site surveys, recovery planning and source recovery, emergency workers protection, co-ordination needs, media communications, assessment of the potential on-site and off-site consequences, survey strategy and actions, recommendations for the protection of on-site and off-site staff, on off-site protective actions and public health
Exercise players	Team of operators (First Responder Team) Emergency Manager Team (on-site) Radiological Assessor Team (specialists) Off-site Authorities Team
Duration [hrs]	4
Activity duration [hrs]	½ – Exercise briefing ½ – Players preparation 2 – Conduct ½ – Conduct - Press conference scenario ½ – Exercise evaluation and discussion
Exercise organisation	Chief controller Group controllers/evaluators
Training material	Exercise manual, worksheets, exercise inputs
Resources	Four rooms with communication lines (phone), log books, communication for the controllers, communications simulation cell

Technical visit

TV_3 Lesson	**Visit to Emergency response Centre in KINS TV**
Purpose	To show, present and discuss an actual example of emergency response centre
Learning objectives	To become familiar with practical solutions in developing and maintaining an actual emergency response centre To see an actual example of roles, functions, responsibilities and capabilities of emergency response centre
Programme	Visit to the emergency response centre Presentation of roles, functions, responsibilities and capabilities of emergency response centre Discussion
Duration [hrs]	1
Training material	Basic information prepared for the visit

Assessment sessions

AS1_7 Lesson	**Pre-test for Training Event No-7** **AS**
Purpose	To evaluate knowledge and experience of participants before commencing the training To give participants an opportunity to self evaluate their gaps in knowledge and experience
Learning objectives	To experience one way of becoming aware of knowledge gaps
Tasks	To answer the questions prepared for the pre-test
Duration [hrs]	½
Training material	Pre-test prepared for the training event
AS2_7 Lesson	**Review-test for Training Event No-7** **AS**
Purpose	To evaluate gained knowledge and experience of participants To give participants an opportunity to self evaluate their remaining gaps in knowledge and experience
Learning objectives	To experience one way of testing gained knowledge
Tasks	To answer the questions and to solve problems To discuss answers and solutions
Duration [hrs]	1 (½ solving the test, ½ discussing the answers and solutions)
Training material	Review-test prepared for training event
AS4_1 Lesson	**Participants' evaluation of training** **AS**
Purpose	To evaluate the effectiveness of the training based on participants feedback To get suggestions for future training improvements
Learning objectives	To experience training evaluation process
Tasks	To evaluate training effectiveness by answering the questions in the training Evaluation Questionnaire and by commenting the workshop effectiveness, benefits and limitations To discuss the workshop effectiveness, benefits and limitations To suggest future improvements (if any)
Duration [hrs]	1
Training material	Evaluation Questionnaire

Activity: L – lecture, EX – exercise, TV – technical visit, VP – video presentation, AS – assessment session

WORKSHOP PROGRAMME

Time	Monday	Tuesday	Wednesday	Thursday	Friday
$8^{00} – 9^{00}$	Registration *Local organisers* Lesson I1_1	Basic principles and … *T. McKenna* Lesson: III1_2	Emergency management *J. Lafortune* Lesson: IV2_2	On-scene medical response *E. Buglova* Lesson: VI3_2	ERC at IAEA *T. McKenna* Lesson: VIII2_1
$9^{00} – 10^{00}$	Opening and training admin. *Host Authorities, H.J. Boado Magan, faculty* Lesson: I1_2 and I1_3	Basic concepts and …. *J. Lafortune* Lesson: III2_1	Medical preparedness for … *E. Buglova* Lesson: VI1_1	Handling of contaminated … *E. Buglova* Lesson: VI3D_1	IAEA assistance *T. McKenna* Lesson: VIII2W_1 Review-test *J. Lafortune* Lesson: AS2_7
$10^{00} – 10^{30}$	**Coffee break**				
$10^{30} – 11^{30}$	Pre-test *R. Martinčič* Lesson: AS1_7 Emergencies at RR *H.J. Boado Magan* Lesson: II1_3	Step-by-step approach … *R. Martinčič* Lesson: III2_2 and III2W_2	Exposure pathways and … *T. McKenna* Lesson: IV3_2	INES and IRSRR *H.J. Boado Magan* Lesson: IV4_7	Review-test (cont'd) *J. Lafortune, faculty* Lesson: AS2_7 Evaluation of training *T. McKenna, faculty* Lesson: AS4_1
$11^{30} – 12^{30}$	Emergencies at RR *H.J. Boado Magan* Lesson: II1_3	Instructing, warning and …. *J. Lafortune* Lesson: IV3_5	Protecting emergency workers *R. Martinčič* Lesson: IV3_3	Emergency at RR Briefing *Sok-Chul Kim, J. Lafortune, faculty* Lesson: IV2T_2 and TV_3	Closing *Host Authorities, Sok-Chul Kim* Lesson: I2_1
$12^{30} – 14^{00}$	**Lunch break**				
$14^{00} – 15^{00}$	Tokaimura and Ulsan accidents *Local Lecturer* Lesson: II2_5 and II2_6	Emergency plans and … *R. Martinčič* Lesson: III2_6	Personal and equipment … *R. Martinčič* Lesson: V2D_2	Emergency at RR Conduct *Faculty* Lesson: IV2T_2	
$15^{00} – 16^{00}$	Non-radiological safety *Local Lecturer* Lesson: II3_8	Emergency Aspects for RR *J. Lafortune* Lesson: III2_10	Emergency monitoring … *R. Martinčič* Lesson: V1_1	Emergency at RR Conduct *Faculty* Lesson: IV2T_2	
$16^{00} – 16^{30}$	**Break**				
$16^{30} – 17^{30}$	Goals of emergency P&R *T. McKenna* Lesson: III1_1	Action Plan *E. Buglova* Lesson: VII1_4	ERC in the region *Local Lecturers* Lesson: SP_1	Emergency at RR Conduct and evaluation *Sok-Chul Kim, J. Lafortune, Faculty* Lesson: IV2T_2 and TV_3	

RESPONSIBILITIES

Responsibility of the Workshop Director

Beside general responsibilities of the Workshop Director (WD) outlined in IAEA guidelines for organization of training courses the WD is also responsible:

1) To make all arrangements to ease the customs formalities for the IAEA workshop equipment (if any);
2) To ensure that all needed equipment will be available and ready for use at the beginning of the workshop;
3) To organize pick-up at the airport and transportation for all participants and lecturers or to prepare clear information about transport arrangements;
4) To maintain administrative office throughout the workshops to be responsible for providing local support, make arrangements, solve problems, as required;
5) To ensure that computer projector, overhead projector, slide projector, video and flipcharts will be available throughout the workshops;
6) To ensure photocopier will be available for unlimited use (within reason);
7) To prepare general information about workshop venue;
8) To arrange, if possible, that all field exercises will be video taped (if any);
9) To ensure that arrangements will be made for a workshop photo;
10) To ensure that cold drinks and coffee will be available during breaks.

Responsibility of the IAEA Technical Officer

Besides general responsibilities outlined in IAEA guidelines for organization of training courses the Technical Officer (TO) has also the following responsibilities:

1) To ensure that equipment which needs to be purchased for the workshops (if any) is ordered in time;
2) To take all in-house administrative steps required to send IAEA owned equipment, needed for the workshops, to the host institution in time;
3) To ensure that workshops' Certificates are prepared and send to the host institution in time;
4) To ensure that IAEA radiation protection surveillance is implemented (if needed);
5) To ensure that all workshop training materials are prepared and send to the host institution in time;
6) To evaluate candidates and to propose selection of participants;
7) To check all arrangements for the workshops before beginning of the workshop;
8) To act as an IAEA representative.

TECHNICAL ASPECTS

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Local lecturers

Faculty	Lectures	Session moderation
H.J. Boado Magan	II1_3, IV4_7	IV2T_2, AS4_1, I2_1
E. Buglova	VII1_4, VI1_1, VI3_2	VI3D_1, IV2T_2
J. Lafortune	III2_1, IV3_5, III2_10, IV2_2	**IV2T_2**, AS2_7
T. McKenna	III1_1, III1_2, IV3_2, VIII2_1	IV2T_2, VIII2W_1
R. Martinčič	III2_2, III2_6, IV3_3, V1_1	I1_3, AS1_7, III2W_2, V2D_2, IV2T_2
Local lecturers	II2_5, II_6, II3_8, SP_1	TV_1

Equipment and supplies

The following equipment and supplies are needed for this workshop.

Equipment item	Minimum number	Required/ Optional	Remark
Survey meters			
Low range beta/gamma dose rate meter	3	R	
Medium range beta/gamma dose rate meter	2	R	
Telescopic detector	1	R	
Contamination monitors			
Alpha/beta contamination monitor	2	R	
Contamination monitor with NaI probe	1	R	
Personal contamination monitor	1	R	
Dosimeters			
Electronic (self reading) dosimeters	5	R	
Sources			
Set of check sources	1	R	
Mantles	10	R	To simulate personal contamination
Personal protection equipment			
Protective overalls (3 sizes)	1	R	Per participant
Overshoes	2 pairs	R	Per participant
Dust masks	1	R	Per participant
Vinyl gloves	3 pairs	R	Per participant
Rubber gloves	1	R	Per participant
Cotton gloves	2	R	Per participant
First aid kit	1	R	
General supplies			
Portable radio communication set	1	R	
Identification badge	1	R	Per participant
Plastic sheets	few	R	
Paper tissues - box	1	R	
Set of warning signs	1	R	
Plastic tape - narrow	1	R	
Plastic tape - wide	1	R	
Plastic bags - different size	few	R	
Waste bag	few	R	
Tags for contaminated equipment	few	R	
Tongs	1	R	
Stretcher	1	R	
Casualty simulation kit	1	R	
Administrative supplies			
Set of worksheets	1	R	Per team
Set of equipment checklists	1	R	Per team

Equipment item	Minimum number	Required/ Optional	Remark
Writing pad	1	R	Per team
Set of waterproof markers	1	R	Per team
Transport			
Medical transportation vehicle	1	R	Normal vehicle can do
Standard workshop supplies			
Photocopier	1	R	
PC computer	2	R	
Printer	1	R	
Internet access		O	To give participants the opportunity to send or receive e-mails
Digital camera	1	R	To take some workshop photos
Video projector (computer linked)	1	R	
Overhead projector	1	R	
Stationery (paper, pens, pencils, etc.)		R	

The host institution will provide all needed equipment and supplies.

Identity badges and certificates

IAEA Certificates of the workshop attendance and identity badges will be prepared for all participants.

Exposure control

At this workshop there is no need for exposure control.

Training material for the participants

The following training material and documents should be available for each participant:

1. Workshop Manual
2. Tabletop Exercise Manual
3. Lecture Notes
4. Documents:
   a. INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Monitoring in a Nuclear or Radiological Emergency, IAEA-TECDOC-1092, IAEA, Vienna (1999)
   b. INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Assessment and Response during a Radiological Emergency, IAEA-TECDOC-1162, IAEA, Vienna (2000)
   c. INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the development of emergency response preparedness for nuclear or radiological accidents, IAEA-TECDOC-953, Vienna, (new addition, 2002)