IAEA Post Graduate Educational Course in Radiation Protection and Safety of Radiation Sources

Intervention for Chronic and Emergency Exposure Situations

Developing a National Capability for Response



Emergency Response Plans

Lecture

Introduction

- The Chernobyl and Goiânia accidents have resulted in a re-examination of many emergency planning principles and practices
- This lesson provides a practical step-by-step method for developing integrated operator, local and national radiation emergency response plans

Content

- Basic concepts
  - Planning areas and zones
  - Planning levels and responsibilities
  - Emergency classes and conditions
  - Integrated planning concept
- Planning methodology
  - Ten tasks
- Summary

Background

- The range of potential radiation accidents is enormous, ranging
  - From a major reactor accident
  - To accidents involving small amounts of radioactive material
- A minimum level of planning is appropriate in every country, even in those without any known radiological activities

Background – Cont'd

- The response to radiation emergency is basically the same as the response to any accident involving hazardous material
- Planning on the basis of established principles of radiation protection and safety is essential
- Provisions should be developed to identify potential radiological hazards
- Radiological plans should be incorporated into plans for all types of hazardous materials

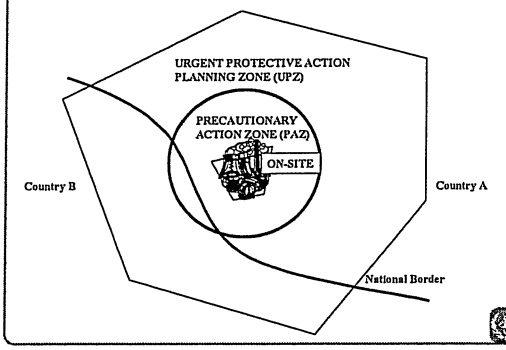
Threat Categories

Threat Category	Radiological Threat
I	Severe deterministic health effects off-site
II	Warranting urgent protective actions off-site, deterministic health effects on-site
III	No urgent protective actions off-site are warranted, severe deterministic health effects on-site
IV	Minimum level of threat – all countries
V	Food contamination due to transboundary contamination necessitating food restrictions

Planning Areas and Zones

- Areas
  - On-site area
  - Off-site area
- Zones
  - Precautionary Action Zone (PAZ)
  - Urgent Protective Action Planning Zone (UPZ)
- Food restrictions planning distance

Concept of Emergency Planning Zones



Response and Planning Zones Sizes

Facility	PAZ	UPZ	FRPD
Category I	3 – 5 km	10 – 25 km	500 – 1000 km
Category II	On-site	0.5 – 2 km	10 – 50 km
Category III	On-site	Not required	Not required

PAZ – Precautionary Action Zone
UPZ – Urgent Protective Planning Zone
FRPD – Food Restrictions Planning Distance

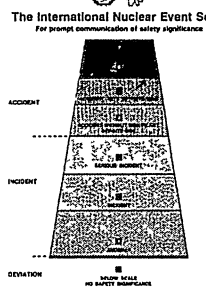
Planning Levels

- Effective emergency response requires mutually supportive and integrated emergency planning at three levels:
  - Operator level
  - Off-site level
  - International level

Emergency Classes

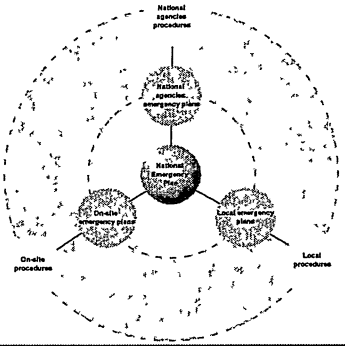
- General emergency
- Site area emergency
- Facility emergency
- Alert
- Uncontrolled source emergency

International Nuclear Events Scale



- INES is designed to indicate how serious an event was after it is understood

Integrated Planning Concept



Planning Metodology

- The planning methodology is
  - Modular
  - Based on extensive consultation
  - Iterative

The Tasks

Tasks	Implementation Time
Designate National PC	○
1. National policy review	△—
2. Perform a threat assessment	△——
3. Develop the planning basis	△——
4. Allocate responsibilities	△—
5. Develop an interim capability	——
6. Write the NREP	——
7. Present the NREP	——
8. Implement detailed plans	——
9. Test the capability	——
10. Establish ongoing maintenance	——

Getting Started

- Designate a single overall National Emergency Planning (EP) Coordinator
  - In-depth technical and operational knowledge of emergency preparedness and response
  - At the early stage involving all parties who have an interest in the development of emergency plan

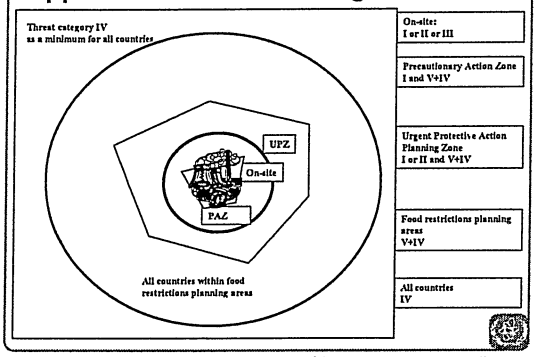
Task 1 – National Policy Review

- A list of the national laws or Acts for emergencies
- International agreements
- A description of roles, responsibilities and capabilities of
  - Major national ministries
  - Local governments and operators
- A description of integration into the planning for other types of emergencies

Task 2 – Perform a Threat Assessment

- Conduct a national threat assessment to identify practices and facilities that may possibly necessitate emergency interventions within the country
- Include facilities outside the country
- Determine the level of preparedness required by determining which threat categories apply

Application of Threat Categories



Task 3 – Develop the Planning Basis

- Gather and document information about the possible accidents and local areas
  - Operator information
  - Off-site information
  - Off-site environmental conditions
- Describe the information in the NREP

Task 4 – Allocate Responsibilities

- Develop a basic concept of operations describing the response to each basically different accident type
- Determine and assign the roles and responsibilities of each group, organisation or individual involved in emergency preparedness and response

Task 5 – Develop an Interim Capability

- Establish an interim emergency response capability
- Establish a notification point where potential radiation emergencies can be reported and assistance obtained
- This task should not be overlooked

Task 6 – Write National Emergency Plan

- Develop a national radiation emergency response plan
- The plan is a summary of the more detailed plans
- It assures that all the other planning is integrated and compatible
- The NREP should address all the facilities and jurisdictions identified in task 2
- In developing the plan, consider the data gathered in tasks 1, 2, 3 and 4

Task 7 – Present National Emergency Plan

- Give formal presentations to the organisations that may be involved, directly or indirectly, in the maintenance and implementation of the plan
- This will achieve a common understanding of the response concepts and principles
- It will allow unforeseen issues to be raised and resolved before they become real difficulties

Task 8 – Implement Detailed Plans

- Develop the infrastructure and functional capabilities needed to implement the NREP for each facility and jurisdiction identified in task 2
- This will include plans, procedures, staff, organisation, facilities, equipment and training
- A group should be assigned the responsibility to assist and help in this effort

Task 9 – Test the Capability

- Conduct drills and exercises
  - Drills provide training
  - Exercises test and verify the adequacy of entire system to include the plans, procedures, facilities, equipment and training
- Identify and correct deficiencies

Task 10 – Implement Ongoing Maintenance

- Ensure that the emergency response capability is maintained and periodically validated
- All groups should develop the means to maintain and update the emergency response programme, including the following:
  - a review of plan and procedures
  - a review of training programme
  - an exercise programme
  - a feed-back process for lessons learned during exercises and real emergencies

Remember

A long-term staff and budget must be provided to ensure that the capability is maintained

Summary

- A minimum level of planning is appropriate in every country
- Effective emergency response requires mutually supportive and integrated emergency planning
- There are ten tasks to develop and implement emergency response capability
- Plans are dynamic documents

Where to Get More Information

INTERNATIONAL ATOMIC ENERGY AGENCY

Method for the development of emergency response preparedness for nuclear or radiological accidents

IAEA-TECDOC-953, Vienna

(new addition, 2001)