

## Foreword

The aim of these training materials is to provide a practical tool for emergency planning for a State embarking on a nuclear power programme, and to fulfil, in part, functions assigned to the IAEA under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention). Under Article 5.a(ii) of the Assistance Convention, one function of the IAEA is to collect and disseminate to States Parties and Member States information concerning methodologies, techniques and available results of research relating to such emergencies.

One of the concerns associated with nuclear power is the possibility that a State embarking on a nuclear power programme might not have sufficient capabilities and therefore would not be adequately prepared to respond to a radiation emergency caused by severe accident conditions. Protecting the public, the environment and property in the event of a failure of any level of defence in depth is the most important safety objective. A robust framework for emergency preparedness and response to a radiation emergency forms the last level of defence in depth and, as such, must be developed and implemented by any State embarking on a nuclear power programme, using best international practices. The establishment of capabilities and arrangements for emergency preparedness and response to severe accident conditions is one of the principal tasks in the development of a national infrastructure for nuclear power. State of the art emergency preparedness and response is a key element in achieving overall plant safety.

This training course complements the IAEA publication 'Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Programme' (EPR-Embarking 2012). These materials are designed to help States apply the guidance in EPR-Embarking 2012, in order to develop the capability to adequately prepare for and respond to a radiation emergency after the commissioning and start of operation of its first nuclear power plant.

The IAEA officer responsible for this work was V. Kutkov of the Incident and Emergency Centre, Department of Nuclear Safety and Security.

## Background

Safety in the operation of a nuclear power plant (NPP) is of great importance for the protection of people, society and the environment in those States considering embarking on a nuclear power programme for the first time, as well as those considering expanding an existing programme. One of the challenges for the governments of those countries is to provide for robust emergency preparedness and response arrangements and capabilities to enable a timely and effective response in a radiation emergency.

As established in the publication Preparedness and Response for a Nuclear or Radiological Emergency (Safety Requirements, Safety Standard Series No. GS-R-2), the practical goal of emergency preparedness is “to ensure that arrangements are in place for a timely, managed, controlled, coordinated and effective response at the scene, and at the local, regional, national and international level, to any nuclear or radiological emergency”. In 2011 the IAEA General Conference, in resolution GC(55)/RES/9, encouraged States “embarking on new nuclear power programmes to take timely and proactive steps, based upon gradual and systematic application of Agency safety standards, to establish and sustain a strong safety culture”. It also “emphasizes the importance for all Member States to implement emergency preparedness and response mechanisms and develop mitigation measures at a national level, consistent with the Agency’s Safety Standards, for improving emergency preparedness and response, facilitating communication in an emergency and contributing to harmonization of national criteria for protective and other actions”.

These materials are designed for use at a standard training course on considerations in emergency preparedness and response for a State embarking on a nuclear power programme. They contain information on:

- (1) Emergency Preparedness in Safety Infrastructure for a Nuclear Power Programme;
- (2) Framework of Emergency Preparedness and Response;
- (3) Characterization of the radiation hazard;
- (4) Radiation Protection in an Emergency Exposure Situation;
- (5) Governmental Infrastructure for Emergency Preparedness and Response;
- (6) Concept of Operations;

- (7) Organization of Emergency Preparedness and Response;
- (8) Emergency Response Considerations in Site Survey and Site Selection for Nuclear Installation;
- (9) Phase 1 of Development of a Framework of Emergency Preparedness and Response;
- (10) Basic Capabilities for Response to a Radiation Emergency;
- (11) Phase 2 of Development of a Framework of Emergency Preparedness and Response;
- (12) Expanded Capabilities for Response to a Radiation Emergency;
- (13) Application of EPR-Embarking for Developing a Framework of Emergency Preparedness and Response;
- (14) Phase 3 of Development of a Framework of Emergency Preparedness and Response;
- (15) Protection of the Public in Emergency Exposure Situation; and
- (16) Role of the IAEA in Support of Emergency Preparedness and Response in Member States.

The information is presented in the form of lectures, work sessions and a table top exercise. In addition to these training materials, the CD-ROM contains a schedule, hand outs for the exercises and standard resources required to hold a training course on considerations in emergency preparedness and response for a State embarking on a nuclear power programme.

## Objectives

- To present guidance and instructions for those States that are considering embarking on a nuclear power programme for the development of an adequate level of emergency preparedness and response to radiation emergencies prior to commissioning their first NPP, as described in the publication 'Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Programme' (EPR-Embarking, 2012);
- To train managers of a national nuclear power programme in Member States embarking on a Nuclear Power Programme and emergency planners on the application of the publication 'Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Programme' (EPR-Embarking, 2012);
- To support the Fundamental Safety Principles and the international requirements on emergency preparedness and response formulated in the IAEA Safety Requirements GS-R-2 and the corresponding guidelines of the IAEA Safety Guides No. GS-G-2.1 and No. GSG-2;
- To explain the need for an effective emergency preparedness and response framework and for maintenance of the emergency preparedness and response programme throughout the lifetime of the facility.

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