

NUCLEAR ENERGY AGENCY  
COMMITTEE ON RADIATION PROTECTION AND PUBLIC HEALTH

Working Party on Nuclear Emergency Matters

INEX 5  
GUIDE FOR NATIONAL PLANNING COMMITTEES  
(EXERCISE ORGANISERS, MODERATORS and EVALUATORS / RECORDERS)

INEX 5 Exercise on  
Notification, Communication and Interfaces Related to Catastrophic Events Involving Radiation or  
Radiological Materials

*DISTRIBUTION: RESTRICTED TO INEX 5 NATIONAL PLANNING COMMITTEES  
(INCLUDING EXERCISE ORGANISERS, MODERATORS, EVALUATORS-RECORDERS)*

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## **INEX 5 EXERCISE ON NOTIFICATION, COMMUNICATION AND INTERFACES RELATED TO CATASTROPHIC EVENTS INVOLVING RADIATION OR RADIOLOGICAL MATERIALS:**

### **GUIDE FOR NATIONAL PLANNING COMMITTEES**

## **1. INTRODUCTION**

### **1.1 Purpose of this Document**

As part of its ongoing series of international exercises, the OECD Nuclear Energy Agency (NEA) has developed the INEX 5 Exercise on (*emergency management aspects / arrangements for*) Notification, Communication and Interfaces Related to Catastrophic Events Involving Radiation or Radiological Materials, to be conducted over nine months period (exercise window) beginning in September 2015. The purpose of this document is to provide guidance to national exercise planning committees (National Exercise Organisers, Moderators and Evaluators / Recorders) on planning, conducting and evaluating a national / regional INEX 5 exercise. It describes the INEX 5 scope and framework, the common exercise scenario and an outline of the roles and resources that will likely be required from each participating country to successfully prepare for and implement an INEX 5 exercise.

This document is part of the set of generic INEX 5 Technical Materials prepared by the NEA. The National Planning Committee members should familiarise themselves with the content of all documents in this set, which include:

- INEX 5: General Information ([NEA/CRPPH/INEX\(2014\)3](#))
- INEX 5: Guide for National Planning Committees ([NEA/CRPPH/INEX\(2015\)1](#)) [*this guide*]
- INEX 5: Guide for Exercise Players ([NEA/CRPPH/INEX\(2015\)2](#))
- INEX 5: Exercise Evaluation Questionnaire ([NEA/CRPPH/INEX\(2015\)3](#))

### **1.2 Background and Overview of the INEX 5 Exercise Concept**

Since 1993, the International Nuclear Emergency Exercise (INEX) series, organised by the OECD Nuclear Energy Agency, has proved successful in testing, investigating and facilitating improvements in emergency management systems nationally and internationally.<sup>1</sup> Previous INEX exercises focused largely on national and international aspects of early phase management of emergencies at nuclear power plants and more recently, in INEX 4, on issues in consequence management and transition to recovery in response to malicious acts involving the release of radioactive materials in an urban setting [1]. Since the accident that occurred in March 2011 at the Fukushima Daiichi nuclear power plant in Japan, it has been recognised that notification, communication, and identifying and obtaining resources during catastrophic events can be difficult and the need for established protocols, policies, and procedures among and between country entities is critical for minimizing negative impacts. Therefore, the benefit and goal of INEX 5 is to provide a basis for enhancing national and international emergency management arrangements related to notification, communication and obtaining resources through the exchange of exercise outcomes and experiences from participating countries, in order to identify good practices and common issues to be addressed.

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<sup>1</sup> Further information on the NEA's emergency management programme: <http://www.oecd-nea.org/rp/wpnem/>

As such, the basic concept for INEX 5 is *i*) to test or identify elements for improving emergency management arrangements for notification, communication and interfaces related to catastrophic events involving radiation and radiological materials, and *ii*) to exchange experience with other countries that have conducted and evaluated an INEX 5 exercise. To meet these goals, the following common **key objectives** have been set:

- Test and investigate the adequacy of national arrangements (*including national coordination and communication*), and where appropriate international arrangements, for notification, communication and obtaining and managing international resource support to respond to a severe contamination event;
- Review and share information on approaches to notification and communication processes in order to identify good practice and to allow review and improvement of local, national and international arrangements;
- Identify key areas and approaches to international coordination and communication in order to provide a basis for improvements in international emergency management systems.

Based on the key objectives, the following specific **topical areas**, which form the basis of the generic exercise play, have been established:

1. Decision-making on notification and communication strategies, including issues in optimisation (technical, economic and social factors), and international communication and coordination;
2. Public information and communication;
3. National and international support (personnel, equipment, etc.).

INEX 5 has been developed based on an escalating scenario involving radiation or radiological material that culminates with a natural event creating a catastrophic event with international implications. The INEX 5 exercise play will begin as a potential radiological event and include the notification and communication processes discussed. It will then escalate to an actual radiological event and include the notification and communication processes associated with that level of event. It will conclude with a catastrophic event (e.g., natural disaster) that involves international notification, communication and interactions associated with needs beyond those available within the country.

INEX 5 has been designed as a “question-driven” table top exercise to be conducted individually by each participating country to support the common exercise evaluation and/or regional table-top to test the international aspects of the exercise. Players will be challenged to use existing policies, protocols, and emergency preparedness and response plans/procedures to explain what notification and communication actions will be provided at each level of the emergency. In addition, players will be expected to discuss their notification and communication expectations during the different event conditions (with emphasis on notification, communication between all the responsible organisations/agencies –Players– participating in the exercise). Discussion among and between players should be open and non-critical. The goal is to establish an enhanced table top exercise environment where issues regarding notification and communication activities can be identified and discussed freely/openly.

As with previous INEX exercises, INEX 5 may include two optional stages; a full field exercise, and a national or a regional table top exercise. Using the generic technical materials developed by the INEX 5 Planning Group, each participating country will organise and conduct a national table top and may participate to an optional regional table top exercise. The IAEA’s Unified System for Information Exchange in Incidents and Emergencies (USIE) exercise module will be used to conduct international aspects of the INEX 5 exercise with the agreed protocols of the Incident and Emergency Centre (IEC) of

the IAEA. Countries may also expand the table top materials into a full field, national issues-driven exercise either before or after the table top exercise. These will be based on a potential radiological event that escalates to an actual radiological event that is further impacted by natural disaster requiring/involving international interfaces. Countries may choose when to conduct their exercises within a common window of several months beginning in September 2015.

Following its exercise, each country will complete a standard questionnaire to capture observations, lessons and issues for submission to the WPNEM's INEX 5 Evaluation Group. This feedback will form the basis of the follow-up INEX 5 International Evaluation Workshop, being organised by NEA for spring 2017 after completion of all national/regional exercises. The workshop will allow participants to exchange and analyse experience from the national exercises and identify cross-cutting issues or gaps impacting multiple states. An important outcome will be the identification of good practices as well as key needs for future work that would benefit from international co-operation.

### 1.3 Exercise Scope and Limitations

It is recognised that while NEA member countries have robust emergency exercise programmes addressing early and longer term issues/arrangements, emergency management aspects /arrangements for notification, communication and interfaces still present some challenges. INEX 5 is therefore intended to assist with implementation and maintenance of effective, compatible, and coordinated national and international arrangements for notification, communication and interfaces related to catastrophic events involving radiation. As such, the INEX 5 exercises will begin as a potential radiological event and include the notification and communication processes discussed. It will then escalate to an actual radiological event and include the notification and communication processes associated with that level of event. It will conclude with a catastrophic event that involves international notification, communication and interactions associated with needs beyond those available within the country. As INEX 5 has been designed as a "question-driven" table top exercise and players will be challenged to use existing protocols, policies and procedures/plans to explain what notification and communication actions will be provided at each level of the emergency. In addition, players will be expected to discuss their notification and communication expectations during the different event conditions. Discussion among and between players should be open and non-critical. INEX 5 is *not intended nor designed* to test any of the relevant international conventions for notification or assistance, and should not be used as such.

INEX 5 is *not* a real-time command-post exercise involving multiple countries. Rather, it is comprised of a series of national/regional exercises conducted by participating countries. To assist National Exercise Organisers in planning a national exercise, the INEX 5 Planning Group has prepared generic technical materials, including a baseline scenario and series of questions for exercise participants to address. To facilitate overall evaluation and experience exchange, all participating countries are strongly encouraged to adopt the common objectives and scenario contained in the framework. While countries may conduct a regional INEX 5 exercise, it is recommended that all participants first conduct individual national exercises to support the common exercise evaluation.

INEX 5 is a "*no fault*" exercise. Neither participating countries nor individuals will have their performance assessed, and outcomes will not be used as such. Evaluation will focus on emergency management arrangements and approaches for notification, communication and interfaces in relation to the exercise scenario, including plans, procedures, organisational structures, information exchange, decision making processes, international interfaces and supporting systems. Each country will perform its own exercise evaluation with the intent to share, as appropriate, its experience internationally. To facilitate overall evaluation and experience exchange, a standard evaluation questionnaire has been prepared based on the common scenario and objectives, for completion and submission to NEA. Each country may also

undertake any other internal evaluation that it feels appropriate, without requirement to share this information.

#### 1.4 Who Should Participate in INEX 5?

INEX 5 is open to all interested countries, both NEA member and non-member countries, and relevant international organisations. As an international exercise series, the key constituencies for INEX 5 participation include emergency planners, responders and technical decision-makers from national authorities. The participation of relevant governmental and non-governmental stakeholders in the national exercises, consistent with the exercise objectives, is both encouraged and supported by the INEX 5 scenario. The extent of participation within a country will be the choice and responsibility of each country. Countries are encouraged to involve neighbouring and other countries that could be involved or provide resources in case of a catastrophic event involving radiation or radiological materials. Because of the individual nature of countries notification and communication processes the table top exercises may have different participants. Below is a generic list of potential table top participants for addressing the INEX 5 questions:

<p><b>Event Scene Players</b></p> <ul style="list-style-type: none"> <li>○ Control Room Operator</li> <li>○ Emergency Preparedness Manager</li> <li>○ On Scene Manager (fire, police, etc.)</li> <li>○ Person responsible for making notifications</li> <li>○ Others</li> </ul>	<p><b>NPP HQ (if participating)</b></p> <ul style="list-style-type: none"> <li>○ President</li> <li>○ Media Interface</li> <li>○ Technical Advisors</li> <li>○ Others</li> </ul>	<p><b>Local Players</b></p> <ul style="list-style-type: none"> <li>○ City Management</li> <li>○ Fire</li> <li>○ Police</li> <li>○ Emergency Services</li> <li>○ Utilities</li> <li>○ Hospitals/Medical Services</li> <li>○ Emergency Management</li> <li>○ Media</li> <li>○ Stakeholders</li> <li>○ Others</li> </ul>
<p><b>State/National</b></p> <ul style="list-style-type: none"> <li>○ Government Officials</li> <li>○ Military</li> <li>○ Media</li> <li>○ Stakeholders</li> <li>○ Emergency Management</li> <li>○ Management Staff for fire, police, medical, emergency services, utilities, infrastructure, etc.</li> </ul>	<p><b>Neighbouring Countries</b></p> <ul style="list-style-type: none"> <li>○ Government Officials</li> <li>○ Military</li> <li>○ Embassies</li> <li>○ Media</li> <li>○ Emergency Management</li> <li>○ Management Staff for fire, police, medical, emergency services, utilities, infrastructure, etc.</li> </ul>	<p><b>International Organizations</b></p> <ul style="list-style-type: none"> <li>○ IAEA</li> <li>○ Embassy</li> <li>○ WHO</li> <li>○ WMO</li> <li>○ FAO</li> <li>○ Others</li> </ul>

NEA has informed and invited the participation of relevant international organisations (IAEA, WMO, WHO, FAO etc.) through the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE). Each interested international organisation is responsible for determining the manner and extent of its possible involvement in the exercise.

## 1.5 National Level Planning and Assistance to National Exercise Organisers

In elaborating the INEX 5 framework, the INEX 5 Planning Group has aimed to make the exercise:

- as simple and cost-effective as possible to plan and implement;
- as transferable as possible between countries and regions; and
- as common as possible amongst all participants, while maintaining a suitable level of flexibility.

Each participating country, through the National Exercise Organisers (Coordinators)/National Planning Committees (NEO/NPC), is responsible for the detailed planning, conduct and evaluation of their exercise, including development of specific national exercise plans, determination of scope of participation and invitation to participants, exercise date, pre-exercising training, exercise conduct, recording and evaluation/analysis. The generic INEX 5 Technical Materials, described below, will enable the NEO/NPCs to develop their specific exercise arrangements within the INEX 5 framework. These materials, which are broadly applicable to a wide range of countries and levels of preparedness, include generic guidance for organisers, moderators and evaluators/recorders and for exercise players; key and detailed objectives and exercise topic areas; a generic exercise scenario and Master Scenario Event List (MSEL) with examples of driving inputs; and an exercise evaluation questionnaire. NEO/NPCs should be able to easily adapt these technical materials as a basis for their specific national or regional exercises. Additionally, countries should be able to re-use, if desired, these technical materials for future notification, communication and interfaces related to catastrophic events involving radiation or radiological materials exercises.

Each participating country should base their national exercise on the INEX 5 key and detailed objectives, generic scenario and topic areas. However, it is recognised that the national requirements for a notification, communication and interfaces exercise may differ between countries, not least regarding the use of a generic scenario. Guidance on use of the generic exercise scenario and MSELs has therefore been provided. It is the responsibility of the NEO/NPCs to develop the precise details of their exercise within the common INEX 5 framework, and include any additional topics and questions as deemed appropriate.

### *INEX 5 Generic Technical Materials*

The following documents comprise the full set of generic INEX 5 Technical Materials. Additional strategic guidance on exercise planning can be found in the NEA report “Strategy for Developing and Conducting Nuclear Emergency Exercises”[3].

a) *INEX 5: General Information* ([NEA/CRPPH/INEX\(2014\)3](#))

This document, aimed at national emergency planners, technical support organisations and decision-makers with a role in nuclear or radiological emergency management, provides an overview of the INEX 5 exercise. While primarily intended to facilitate decisions by those organisations responsible for national exercise programmes on national participation in the INEX 5 exercise series, it also serves as a basic information document on the exercise.

b) *INEX 5: Guide for National Planning Committees* ([NEA/CRPPH/INEX\(2015\)1](#))

This document provides members of the National Planning Committee, including National Exercise Organisers, Moderators and Evaluators/Recorders, guidance for planning, conducting and evaluating a national INEX 5 exercise. It describes the common INEX 5 framework, including the objectives, generic scenario and recommended exercise format, and an outline of the resources that are likely to be required from each participating country to prepare for and implement their exercise.

c) *INEX 5: Guide for Exercise Players* ([NEA/CRPPH/INEX\(2015\)2](#))

This document provides general guidance to exercise players on participation in their country's INEX 5 exercise, and is intended to be read in conjunction with the INEX 5: General Information document.

d) *INEX 5: Exercise Evaluation Questionnaire* ([NEA/CRPPH/INEX\(2015\)3](#))

This document provides the common evaluation questions to facilitate *i*) the work of the NEO/NPCs in planning their national exercise and *ii*) the evaluation and recording by the evaluator/recorders of the exercise outcomes in relation to the exercise scenario and common MSELs. The set of completed evaluation questionnaires from all participating countries will allow the INEX 5 Evaluation Group to compare the national exercises outcomes with regard to the common objectives.

## 2. PLANNING AN INEX 5 EXERCISE

The INEX 5 Technical Materials aim to provide broadly applicable guidance to exercise organisers and participants to ensure a common approach in planning and evaluation, recognising that emergency arrangements and approaches may differ between countries. It should therefore be noted that these materials, including this document, are provided as *guidance* to assist exercise organisers, and that each participating country is solely responsible for the specific planning and implementation required within their country to meet their national exercise requirements and objectives. However, while participating countries are responsible for organising an exercise as they deem appropriate, NEO/NPCs are *strongly encouraged* to adopt the exercise framework outlined in this document to ensure a common basis for comparing exercise outcomes.

The subsequent sections of this document provide guidance on the INEX 5 framework (objectives, scenario, format); and the types of resources that will be likely to be required from each participating country to prepare, conduct and evaluate a national/regional INEX 5 exercise, including the roles and responsibilities of the various members of the national planning committee.

### 2.1 INEX 5 Objectives and Topical Areas

The main goals of INEX 5 are to allow participating countries to *i*) test or identify elements for improving their emergency management arrangements for notification, communication and interfaces related to catastrophic events involving radiation or radiological materials, and *ii*) exchange experience with other countries that have conducted and evaluated an INEX 5 exercise. To meet these goals, the following common **key objectives** have been set:

- Test and investigate the adequacy of national arrangements (including national coordination and communication), and where appropriate international arrangements, for notification, communication and obtaining and managing international resource support to respond to a severe contamination event;
- Review and share information on approaches to notification and communication processes in order to identify good practice and to allow review and improvement of local, national and international arrangements;
- Identify key areas and approaches to international coordination and communication in order to provide a basis for improvements in international emergency management systems.

Based on the key objectives, the following specific **topical areas**, which form the basis of the generic exercise play, have been established:

1. Decision-making on notification and communication strategies, including issues in;
  - optimisation (technical, economic and social factors);
  - international communication and coordination.
2. Public information and communication;
3. National and international support (personnel, equipment, etc.).

The topical areas will be evaluated from both a national and international perspectives and form the core of the exercise and post-exercise evaluation questionnaire.

**2.2 Exercising the INEX 5 Objectives: Scenario and Timeframe of Interest**

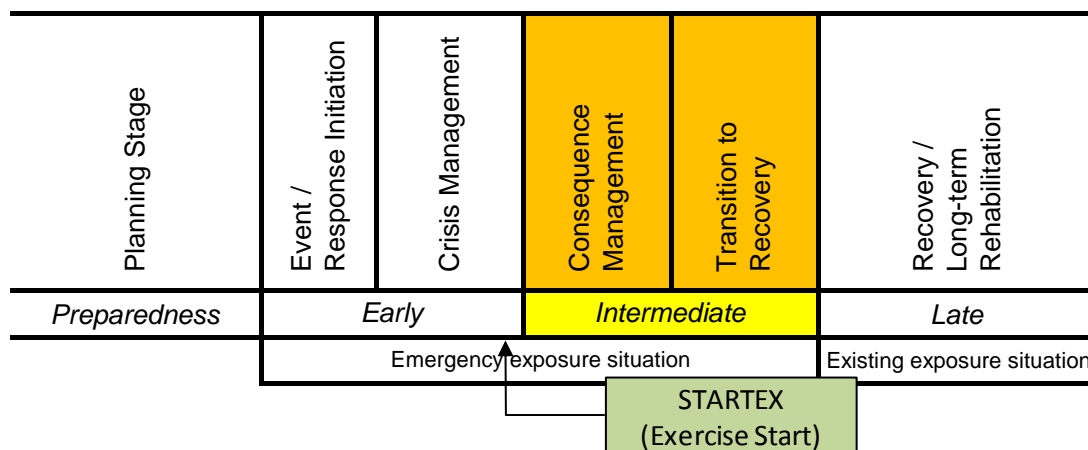
To meet the identified exercise goals and objectives and to facilitate the participation of any interested country, INEX 5 has been developed around a single generic scenario based on radiological release of significant levels to affect trans-boundary locations. INEX 5 is set up as a table top exercise with three levels of discussion for participants (prior to a release, recognizing/validating a release, and impacts to the radiological event from a catastrophic natural event). The basic design characteristics for the scenario include:

- An escalating scenario involving radiological release that culminates with a natural event;
- For countries without NPPs, to consider participating with neighboring countries with NPPs for receiving and requesting information.

The start of exercise play (STARTEX) within the INEX 5 framework occurs at a time clearly identified as being after the crisis/early phase has ended (see Figure 1). While issues related to the initial crisis management will inevitably be discussed during the exercise, crisis phase play is considered out of scope of the exercise and generic technical materials have not been developed to support such play.

All countries will start at the same point in the post-crisis phase and with the same level of information. Events to the “left” of STARTEX, including actions implemented or terminated, are part of the generic technical scenario and therefore common to all exercises. The specific exercise issues raised in each national exercise will build off of this common basis. It is therefore important to understand that players will be starting the exercise play at a point after which an emergency response would have already started, and will need to play the exercise as if they had already been involved in the early phase response (according to specific national arrangements), without replying or revisiting the initiating scenario. Adequate pre-exercise briefings will be critical to ensure that players and moderators understand the scope and expectations of exercise play and the details of the scenario.

**Figure 1:** Overview of timelines for emergency management and proposed exercise start



In developing the generic technical materials, due consideration has been given to the exercise start conditions. It is suggested that STARTEX represents a day after the initiating event and the start of the exercise. Specifically, it is assumed that the following conditions apply:

- An event is identified at a Nuclear Power Plant (NPP).
- For ~ 12 hours, sequence of events and the event classification (Alert) does not change.
- The onsite emergency response organization for response to an Alert is assembled and all emergency response facilities are staffed.
- No radiological material release has occurred or is expected at this time.
- Notifications are made to local response organizations, national agencies and regulatory agencies.
- No offsite protective action recommendations are made. Twelve hours after the initial problems are recognized, the reactor accident sequence continues to deteriorate and the control room continues to monitor the accident.

A key feature of the specific scenario and timeline to be adopted in a national exercise is that it is a credible and realistic trigger for a national emergency response. The generic INEX 5 scenario and MSELs provide a reasonable basis for NEO/NPCs to develop their specific exercise scenario through placement/location in a chosen environment. Based upon the specific scenario, the NEO/NPCs can prepare an appropriate test or investigation of their national arrangements and objectives, allowing players to focus upon the types of decisions and actions to be taken as part of notification, communication and interfaces.

In summary, to facilitate national exercise planning and conduct and support overall INEX 5 evaluation and experience exchange, NEO/NPCs are *strongly encouraged* to use the common objectives and scenario as the basis for developing the specific scenario for their exercise. More detail on the generic scenario, including guidance on its use in a specific national setting, is provided in the Annexes.

## **2.3 INEX 5 Format and Conduct**

### ***National Table-top Exercises***

It is recognised that all emergency planning and response organisations are typically limited in time and resources. Therefore, to allow an effective investigation of the key objectives and topical areas over the extended timeline, INEX 5 has been designed as a “question-driven” table top exercise to be conducted individually by each participating country. The emphasis of exercise play is on discussion, problem solving and issue identification rather than rapid decision-making. This will allow participants to investigate in depth their arrangements and associated issues for dealing with the exercise scenario as it develops over time, without the resource constraints associated with a realistic and protracted decision-making timeline.

Through the assistance of appropriately selected moderators, the discussion format will allow players to fully consider all relevant issues, ensure that all exercise objectives and topics are addressed, and prevent re-consideration of actions included in the scenario. Players will be challenged to use existing protocols, policies and procedures to explain what notification and communication actions will be provided at each level of the emergency. In addition, players will be expected to discuss their notification and communication expectations during the different event conditions in response to the specific scenario and MSELs. Discussions will typically focus on notification, communication aspects and actions, evaluating procedures and interfaces among organisations (nationally and internationally), addressing the technical and social problems presented, highlighting local, national and international issues that arise and identifying potential improvements. Outcomes brought forward by this process are recorded for completion of the evaluation questionnaire, for future action and for consideration in the INEX 5 international evaluation workshop.

It is the view of the INEX 5 Planning Group that this approach will provide an appropriate vehicle for countries to review their national arrangements for addressing the exercise scenario, with international aspects driven through appropriate exercise inputs. While countries may conduct a regional INEX 5 exercise if deemed appropriate, it is recommended that all participants first conduct individual national exercises to support the common exercise evaluation.

### ***Generic Outline of Exercise Play***

The duration and form of the individual INEX 5 exercises may differ between participating countries, depending on considerations specific to each country and the availability of players and resources. The NEO/NPC is responsible for determining the appropriate exercise duration in their country, however, it is suggested that most will probably span 1-2 working days. While the specific details of exercise play for each exercise will be determined by the NEO/NPC according to national requirements, the following provides a broad outline of elements that should be generally applicable to all exercises.

The INEX 5 Planning Group has suggested that a single day exercise can be structured as follows:

- Exercise start and initial briefing (1 hr);
- Exercise play: Addressing the three topical areas (1 hr each, including 40 minutes of play/discussion and 20 minutes summary of main outcomes);
- Exercise summary, debriefing and wrap-up (1 hr).

It is suggested that countries wishing to extend the duration of the exercise may do so by increasing the time allocated to the discussion of the topical areas.

During the exercise, it is foreseen that the Exercise Players from the various relevant organisations and stakeholders are gathered in a common location arranged, for example, by organisation or notification and communication function. The Exercise Moderator will provide the overall control to the exercise and facilitate the discussions based on the scenario evolutions and MSELs. To provide some discipline for a large group of Players, each group could nominate a primary spokesperson for overall group presentations and discussion. The primary spokesperson should be apparent, based on the national emergency response arrangements.

While all Players are expected to be familiar with all pre-exercise documentation, the exercise should begin with an initial briefing from the Exercise Moderator to provide the context for the exercise play. The Players should be given a copy of the initial briefing so that the information provided is not misunderstood and can be referenced as the exercise progresses. It is suggested that the initial briefing include a review of the following aspects of the INEX 5 exercise:

- The exercise background, objectives and scope;
- The manner in which the exercise will be conducted;
- The topics areas to be investigated;
- The initiating scenario, including decisions, actions, national and international notifications/communications, start conditions, assumptions, limitations and subsequent scope of exercise play; and
- The exercise rules to be followed and administrative announcements to be noted.

The Moderator should remind Players that they are responsible for maintaining the exercise play and discussions within the INEX 5 scope and objectives. As the scenario assumes that the early crisis phase response has already been completed, it will be important for Players to understand and accept the situation

as presented at the start of the exercise, including its related assumptions and the expected scope of play. Players should also be reminded that the existing national emergency response arrangements or procedures should be followed to the extent possible during the exercise play and that any modifications required dealing with either gaps in arrangements or exercise artificialities should be appropriate and documented.

As the exercise progresses, the Moderator will provide Players with updated information (such as narrative descriptions, situation reports, maps, etc.) related to the evolution of the emergency situation and associated issues and questions described in the MSELs to facilitate detailed discussion on notification, communication arrangements and identify good practices or gaps to be addressed in post-exercise follow-up. The Moderator should ensure that the Players discuss their arrangements to manage the situation, including consideration of appropriate countermeasures. Players may assume the use of equipment and resources compatible with the arrangements that exist in their country, including bi- and multi-lateral agreements. If additional resources would be required, this should be recorded in the exercise outcomes.

The time allocated to each exercise topic issue, as defined in the exercise plan, should be enforced by the Moderator during the exercise play to ensure that all topics are addressed in the allocated time, although planners are free to place particular focus on specific issues according to national need. In order for the exercise to address, within the exercise duration, issues that would, in an actual event, arise over an extended time period; “time compression” will be adopted in the exercise conduct. Exercise Players will be told by the Moderator when time has “jumped forward” in the scenario evolution. Any artificiality introduced through this process will be managed by the use of appropriate briefing materials and inputs.

At the exercise conclusion, the Moderator will indicate the termination of the exercise play to all Participants and outline the next steps with respect to the exercise outcomes and evaluation. This will normally include an immediate post-exercise debriefing between Evaluators/Recorders and the Players to record any additional information and general impressions, and a final wrap-up. In addition, Players should be invited to provide any additional explanatory material for inclusion in the exercise report if deemed useful. It should also be indicated that all Player organisations will receive a copy of the National Exercise Report and a copy of any final report published by NEA following the international evaluation workshop.

### ***Exercise Artificiality and Simulation***

By definition, an exercise is a simulation of a postulated event. In the case of INEX 5, Players will be briefed by the Moderators to expect and be prepared to accept some exercise artificialities, such as data, information or limitations on play that are introduced by the Moderators to help ensure that Players are not unduly hindered by the absence of a person, organisation or information that they would ordinarily expect to be available. Given the artificiality that is introduced by starting an exercise, the extended initial briefing session of the early phase response, key issues and exercise starting conditions as elaborated in the scenario will be key to addressing Players’ questions, frame the subsequent exercise play and allow participants to familiarise themselves with the other players and organisations that would have already come together during the crisis phase.

Another instance of artificiality is possible simulation of any non-participating organisations. In order to address the exercise topics in the time available and with limited participation, the Moderators may be required to simulate input from non-participating organisation, as appropriate to the exercise format and the issues being addressed. To minimise artificialities, NEO/NPCs are encouraged to make use of or reference available resources and decision-support tools as appropriate, for example in the preparation of exercise injects, although this is less critical for investigation of the intermediate phase in comparison with early phase exercises. For INEX 5, any required external communications will be defined by national objectives.

## 2.4 INEX 5 Participants and Training

The key constituencies for INEX 5 participation include emergency planners, emergency managers, responders, policy staff and technical decision-makers from national organisations and agencies. NEO/NPCs are also encouraged to consider the participation of other relevant stakeholders consistent with the exercise objectives. In all cases, the extent of participation, including other relevant governmental and non-governmental stakeholders, will be according to direction of the NEO/NPC and the ability to obtain commitments on participation. As the table-top exercise format is intended to encourage full discussion of the exercise issues, it might generally be expected to limit participation to about 25-40 players, depending on the national organisation. However, participation should be consistent with national requirements and the ability to achieve the exercise objectives.

It is likely that some invited organisations will be unable to participate in INEX 5 and that their involvement may need to be simulated. It is suggested that these artificialities be minimised as much as possible. In the event of non-participation of some key organisations, it is recommended that NEO/NPCs and Moderators gain an adequate understanding of their role relative to the exercise scenario in order to provide suitable information during the exercise, if required.

Participating countries are responsible for training their own Players, Moderators and Evaluators/Recorders. It is suggested that NEO/NPCs may use the generic INEX 5 Technical Materials as a basis for training on aspects specific to INEX 5. NEO/NPCs are responsible for any pre-exercise training or information sessions for players on specific national consequence management arrangements.

## 2.5 INEX 5 Evaluation: National and International

*INEX 5 is a "no fault" exercise. Neither participating countries nor individuals will have their performance assessed.*

### *National Evaluations*

The fundamental reason for conducting a national INEX 5 exercise is to test and investigate national arrangements or approaches on emergency management aspects of notification, communication and interfaces, and to identify relevant issues and facilitate improvements nationally and internationally. In order to provide a basis for improvements, it is important that the experience and outcomes of the national INEX 5 exercises be documented and shared to the extent possible. As with other INEX exercises, the INEX 5 evaluation will be based on national outcomes using a common evaluation questionnaire distributed as part of the generic technical materials, and an international evaluation workshop held after exercise completion. The *INEX 5 Exercise Evaluation Questionnaire* has been developed based on the INEX 5 generic scenario and MSELs. The questionnaires and overall evaluation focus on identifying good practices, common issues and areas for further investigation.

Following the exercise, the Moderator Team and other relevant personnel will complete the evaluation questionnaire for submission to the NEA within 8 weeks of the exercise completion, as well as any specific exercise report for internal use within the country. The information recorded by Evaluators/Recorders during the exercise will provide the basis for these reports.

### *INEX 5 International Evaluation Workshop*

The outcomes of each national exercise in terms of observations, lessons and issues identified in the evaluation questionnaires will form the basis of the follow-up INEX 5 International Evaluation Workshop, which is being organised by NEA for 2017 after completion of all national exercises in participating countries. The objective of the workshop is to allow participants to exchange and analyse experience from

the national/regional exercises, identify good practices as well as cross-cutting issues or gaps impacting multiple states, and formulate key needs that would benefit from international co-operation. All countries having conducted an INEX 5 exercise, in addition to other interested countries and international organisations, will be invited to participate in the workshop.

### 3. INEX 5 NATIONAL PLANNING REQUIREMENTS

Each country participating in INEX 5 will be required to organise its own exercise based on the generic technical materials. It is recognised that considerable effort will be required from participants to plan and conduct a national INEX 5 table-top exercise. Specifically:

- A national planning committee will be required to plan, conduct and evaluate the exercise;
- A credible specific scenario with associated MSELs based on the generic INEX 5 scenario will need to be developed for exercise play. The scenario should clearly and coherently lead into the exercise start so that all exercise topics will be addressed;
- The extent of exercise participation will need to be determined and organised;
- All exercise documentation and instructions will need to be developed, clearly identified and labelled, and distributed to the appropriate audiences in advance of the exercise;
- All participants (players, moderators, evaluators) will need to understand their roles;
- All relevant exercise information will need to be recorded in an appropriate manner to facilitate post-exercise evaluation, and the common evaluation questionnaire will need to be completed and submitted to the NEA in a timely manner.

While planning approaches may differ between countries, in general each country should have a National Exercise Organiser (NEO) that will “own” the exercise and have overall responsibility for ensuring efficient exercise delivery and that all participating organisations are involved from the beginning of the INEX 5 development process. To support exercise delivery, a National Planning Committee, chaired by the NEO and composed of representatives from participating organisations, as well as the exercise Moderator(s) and Evaluator(s), should be responsible for the overall planning, preparation and implementation of the exercise.

#### 3.1 National Level Organisation

##### *National Exercise Organiser / National Planning Committee*

The NEO will have overall responsibility for ensuring efficient exercise delivery and that all participating organisations are involved from the beginning in the INEX 5 development process. As chair of the National Planning Committee, the NEO should have a good understanding of the arrangements to be tested and investigated. Under the direction of the NEO, the NPC will be responsible for the overall planning, preparation and implementation of the exercise. Depending on the extent of participation, it is suggested that each organisation with responsibilities to respond to incidents within the INEX 5 framework nominate an Exercise Planning Representative to participate in the NPC. These individuals will represent their organisations on the NPC, attend all meetings, participate in its work programme and assess the proposed exercise implementation plan.

##### *Exercise Moderators*

*Exercise Moderators* are designated individual(s) within the exercise venue with the responsibility for maintaining the efficient conduct of a national INEX 5 exercise. The Exercise Moderator is responsible for

ensuring that the exercise play and discussions progress smoothly according to the exercise framework, and that Exercise Players are provided with all necessary technical materials and driving inputs according to the exercise timeline. The Moderator should be selected based on experience and qualifications and participate fully in the exercise planning arrangements. Depending on the specific exercise format, Moderators may be supported by Assistant Moderators to monitor the actual play and help assure that all the required data and information is obtained.

As INEX 5 is a question-driven discussion-based exercise, Moderators have a key role in ensuring that the exercise remains focused and within scope, that all topic areas are adequately addressed, that issues are brought forth, discussed and recorded, and that all opportunities are taken to achieve the exercise objectives within the exercise timeline. During the exercise, the Moderator will provide the initial exercise briefing to set the exercise scope and scene for the Players, and ensure the exercise progress by introducing the scenario updates and topical questions to be addressed. The Moderator should use this information to elicit responses and discussion of the issues defined by each topical area. While the exercise play is foreseen to occur in a general sequential manner according to the scenario evolutions, Moderators should be prepared to revisit cross-cutting topics as appropriate. The Moderator will encourage Players to identify:

- the arrangements needed to address the situation (existing or to be developed);
- information needed to support national decision-making for notification and communications, as well as information that would need to be supplied to support external decision-makers (including in other countries);
- the decisions that would be made and their bases;
- the capabilities that would be deployed or needed; and
- gaps or issues that need to be addressed in follow-up to the exercise.

At the end of exercise question, the Moderator should encourage a senior participant to summarise the discussion to move the exercise forward and strive to obtain a consensus for major points. If there are areas where Players lack clarification or disagree, the Moderator should identify the issue and move on rather than spend excessive time in debate or develop a new policy. Moderators should also record observations relating to the exercise design and conduct to provide the context for the post-exercise evaluation.

In preparation for the exercise, Moderators/Assistant Moderators should be fully familiar with the contents of this guide and other national INEX 5 documentation, and understand the exercise scope and limitations. Moderators are expected to attend any specific information sessions concerning their roles and responsibilities and to participate in all pre-exercise training sessions or briefings for players.

### ***Evaluators/Recorders***

Exercise Evaluators/Recorders are the designated individual(s) within the exercise venue responsible for ensuring that exercise activities, decisions, events, issues and outcomes in relation to exercise objectives and topics are accurately recorded to support the completion of the INEX 5 Exercise Evaluation Questionnaire and any other national reporting. In order to undertake this effectively, Evaluators/Recorders should have a complete understanding of the INEX 5 key and detailed objectives, the evaluation questionnaire, and any national objectives developed specifically for the national exercise. They should also understand how those objectives are intended to be demonstrated by exercise play.

Depending on the size and format of the INEX 5 exercise, several Evaluators/Recorders may be required to ensure adequate recording of the exercise, and may be assigned to each key organisation or functional area during the exercise. During the exercise conduct, Evaluators/Recorders are responsible for

maintaining an annotated exercise timeline against which all “events and outcomes” should be recorded and evaluated. In general, the following should be included and recorded:

- Time (exercise time) of event or topic/issue;
- Description of event or issue;
- Decision and/or action taken (any decisions made by Players), including rationale;
- Discussions about the decision;
- Issues (e.g., jurisdiction, adequacy of/exceptions to normal procedures, resources/capabilities needed, international implications, etc.) and their resolution (whether the issue was resolved and how, or was tabled for post-exercise discussion);
- Other relevant observations.

It is essential to the post-exercise evaluation that all information relevant to the demonstration of the exercise objectives be completely and accurately recorded. Evaluators/recorders should note if particular emphasis was placed on a given topic.

At appropriate breaks during the exercise, Evaluators/Recorders may need to discuss their observations with the Players and Moderators in order to ensure accuracy and completeness. At the end of the exercise, a debriefing should be undertaken to record any additional information and general impressions, including any perceived strengths or gaps in the response arrangements or suggestions for future exercises.

### ***Exercise Players***

Exercise Players include all invited participants from responsible organisations and agencies under the national emergency arrangements that are required to respond to the exercise scenario. It is expected that they are officials or other representatives of the principle response organisations/ national authorities (e.g., emergency planners, emergency managers, responders, policy staff and technical decision-makers) within the country, as well as other invited relevant governmental and non-governmental stakeholders. Given the nature of the INEX 5 exercise, the Players could also include elected representatives or Ministerial appointments as appropriate. All Players will be expected to follow their established procedures or be prepared to discuss their reactions to exercise events as they develop or are presented. These actions should be consistent with what they would be expected to do under normal routine or special emergency responsibilities. Relevant generic guidance can be found in the document *INEX 5: Guide for Players*.

### **3.2 National Level Exercise Materials**

As part of the national planning for INEX 5, it is expected that a series of exercise documents will be prepared by the NEO/NPCs. These will generally include a guide for national planning committees (including specific national scenario and MSELs), a guide for players and an exercise evaluation questionnaire. National planning committees may either directly adopt the INEX 5 generic technical materials or use these as the basis for their national documentation. NEO/NPCs should also prepare any other required national level exercise materials according to their normal exercise arrangements.

The responsibility for the preparation of the MSELs, briefing materials and driving inputs should lie with the NEO. These include the finalised MSELs and any supporting technical briefing materials and driving inputs such as maps, data, etc. All materials to be used during the exercise should be distributed to Moderators in a manner that identifies when it is to be circulated to the Exercise Players. Exercise Players should not be provided with briefing material before it is valid.

With the exception of the INEX 5 General Information document, NEA recommends that all INEX 5 materials be controlled and distributed carefully in order to prevent Exercise Players becoming familiar with the exercise injects in advance of exercise conduct. Whilst it is envisaged that the INEX 5 documentation will be provided electronically, it is suggested that a colour coding system be adopted to ensure that printed documentation is not inadvertently distributed to an inappropriate audience. The following distribution and colour codes are provided as examples:

<b>Documents</b>	<b>Distribution</b>	<b>Colour code</b>
General Information	Not restricted	n/a
Guide for National Planning Committees, including MSELs, briefing materials, driving inputs	National planning team (organisers, moderators, evaluators/recorders)	Colour 1
Exercise Evaluation Questionnaire		
Guide for Exercise Players	All Participants	Colour 2

### **3.3 Participant Orientation, Training and Supporting Documents**

At an appropriate time prior to the exercise, briefings to the Moderator Teams and Exercise Players should be conducted by the Moderator under NPC direction to ensure that all the exercise participants understand how the tabletop/workshop exercise will be conducted.

#### ***Moderator Team Briefing***

The purpose of this briefing is to ensure that Moderators and Evaluators/Recorders know how to carry out their tasks and responsibilities during the exercise. A suggested agenda for this briefing is as follows:

- Background, purpose and objectives of the INEX 5 exercise;
- Review of the national emergency management organisation, with a focus on emergency management aspects of notification, communication and interfaces relevant to the INEX 5 scenario;
- Review of the type of notifications(s) and communication(s) to be considered;
- Exercise structure and rules (for participation, conduct, artificialities, time compression, etc.);
- Exercise documents;
- Roles and responsibilities of the Moderator Team;
- Scenario description and master scenario events list;
- Use of technical data, maps and other information;
- Procedures for Moderators and Evaluators/Recorders;
- Post-exercise debriefing and exercise reporting (national, international).

It may be also valuable for the Moderator Team to “walk through” the exercise to be prepared for the likely reactions to exercise inputs and the means by which they may be managed.

#### ***Exercise Players Briefing***

The purpose of this briefing is to inform the Exercise Players of the purpose, objectives and format of the exercise such that they will understand how it will be conducted and how they will be expected to participate. As the INEX 5 exercise has been designed to start after the termination of the early phase, it can be assumed that at the point in the response represented by the exercise start, the relevant organisations would already have been activated and responding to the event, and that the details of the situation would

be known. Therefore, to avoid spending unnecessary time at the exercise start reviewing and assimilating the start conditions, it is recommended to hold a briefing at a convenient point prior to the exercise to familiarise the players with the scenario and with other participants. A suggested agenda for such a briefing is as follows:

- Background, purpose and objectives of the INEX 5 exercise;
- Review of the national emergency management organisation, with a focus on emergency management aspects of notification, communication and interfaces relevant to the INEX 5 scenario;
- Review of the type of notification(s) and communication(s) to be considered;
- Exercise structure and rules (for exercise participation, conduct, artificialities/assumptions, time compression);
- Exercise documents;
- Roles and responsibilities of Players and the Moderator Team;
- Scenario description and start conditions;
- Use of technical data, maps and other information;
- Post-exercise debriefing and exercise reporting (national, international);

This briefing should not replace the requirement for an appropriate briefing at the exercise start.

#### 4.4 Suggested Work Programme

In order to facilitate INEX 5 planning, conduct and evaluation and organisation of the post-exercise International Evaluation Workshop, it is proposed that all individual exercises be held in the period of September 2015 – June 2016. Within this window, NEO/NPCs should organise their exercises at a time that is most convenient to their country. The exercise evaluation questionnaires should be completed and submitted to the NEA Secretariat within 8 weeks following the completion of each national exercise. A general timetable for planning and conduct is provided below. It is fully acknowledged that NEOs may be required to account for other national exercise programmes in their specific timetables.

Time	Action
October- November 2014	Approval and distribution of the INEX 5 Technical Materials <i>Exercise preparation (see following table)</i>
Sep 2015 - June 2016	Official time window for INEX 5 conduct (choice of each country within this period for date of its national / regional exercise)
<i>8 weeks following exercise completion</i>	Completed INEX 5 Exercise Evaluation Questionnaire sent to NEA (to be sent no later than October 2016)
Spring 2017	International INEX 5 Evaluation Workshop

Suggested Period Before Exercise Conduct	Activity
6-9 months	Identification of National Exercise Organiser/National Planning Committee
6-9 months	First Planning Meeting (including identification of exercise planning representatives)

6 months	Identification of national exercise objectives; Identification of organisation-specific objectives and key driving inputs
3 months	Second Planning Meeting (including approval of national objectives and coordination of any organisation-specific objectives)
3 months	Preparation of exercise documentation; Preparation of exercise briefing materials
1 month	Third Planning Meeting (including approval of exercise documentation, plans for distributing exercise briefing materials etc.)
--	INEX 5 exercise conduct
<b>Suggested Period After Exercise Conduct</b>	<b>Activity</b>
<1 month	National de-brief meeting
<2 months	Completion of INEX 5 Exercise Evaluation Questionnaire
Spring 2017	Attendance at International INEX 5 Evaluation Workshop

#### 4. REFERENCES

- (1) OECD NUCLEAR ENERGY AGENCY, Summary of the Fourth International Nuclear Emergency Exercise (INEX-4) and Topical Session, OECD/NEA, Paris (2014), available at: <http://www.oecd-nea.org/rp/reports/2013/nea-crpph-r2013-1-inex4.pdf>
- (2) OECD NUCLEAR ENERGY AGENCY, Experience from the Third International Nuclear Emergency Exercise (INEX 3) on Consequence Management, OECD/NEA, Paris (2007) available at: <http://www.oecd-nea.org/rp/reports/2007/nea6163-inex3.pdf>
- (3) OECD NUCLEAR ENERGY AGENCY, Strategy for Developing and Conducting Nuclear Emergency Exercises, OECD/NEA, Paris (2007) available at: <http://www.oecd-nea.org/rp/reports/2007/nea6162-emergency.pdf>
- (4) INEX 5 Exercise on Notification, Communication and Interfaces Related to Catastrophic Events Involving Radiation or Radiological Materials, General Information, [NEA/CRPPH/INEX\(2014\)3](#), OECD/NEA, Paris (2014), available at: <http://www.oecd-nea.org/rp/docs/2014/crpph-inex2014-3.pdf>
- (5) INEX 5: Guide for National Planning Committees ([NEA/CRPPH/INEX\(2015\)1](#))
- (6) INEX 5: Guide for Exercise Players ([NEA/CRPPH/INEX\(2015\)2](#))
- (7) INEX 5: Exercise Evaluation Questionnaire ([NEA/CRPPH/INEX\(2015\)3](#))

## 5. GLOSSARY OF TERMS

<i>National Exercise Organiser</i>	The individual or organisation who “owns” the exercise and has overall responsibility for ensuring efficient exercise delivery and that all participating organisations are involved from the beginning of the exercise development process.
<i>National Planning Committee</i>	The collective group of representatives from responsible organisations (see Exercise Planning Representative), chaired by the National Exercise Organiser, with the overall responsibility for delivering the national tabletop or workshop exercise.
<i>Exercise Planning Representative</i>	The individual(s) nominated within each participant organisation with the responsibility for co-ordinating the preparation and delivery of the materials required for the INEX 5 exercise.
<i>Exercise Player</i>	A participant in the exercise that is required to respond to the exercise scenario in accordance with existing policies, protocols, and emergency preparedness and response plans/procedures.
<i>Exercise Moderator</i>	The individual(s) with responsibility for maintaining the efficient conduct of a national INEX 5 exercise. The Exercise Moderator is responsible for ensuring that the exercise play and discussions progress smoothly according to the exercise framework, and that Exercise Players are provided with all necessary technical materials and driving inputs according to the exercise timeline.
<i>Exercise Evaluator/Recorder</i>	The individual(s) with the responsibility for ensuring that exercise activities in support of exercise objectives are effectively recorded to support the completion of the INEX 5 Exercise Evaluation Questionnaire and any other exercise reporting.

## ANNEX 1

### INEX 5 GENERIC SCENARIO

#### 1. Overview of the Generic INEX 5 Scenario

Taking into consideration the identified exercise goals and objectives and to facilitate the participation of any interested country, INEX 5 has been developed around a single generic scenario based on a potential radiological event that escalates to an actual radiological event that is further impacted by natural disaster requiring/involving international interfaces. The basic design characteristics for the scenario include:

- Based on a NPP event, exacerbated by a natural disaster and radiological release of significant levels to affect trans-boundary locations.
- The scenario timeline does not include specific times or specific events because the objective of this tabletop exercise is to identify and clarify response needs for countries without NPPs, but which may be impacted by a radioactive material release from another country's NPP event.
- The Potentially Impacted scenario is recommended for countries without well-established radiological response plans and procedures who want to focus on the response to the radiological aspects of an event.
- The Actually Impacted scenario is recommended for countries with well-established radiological and natural disaster response plans and procedures who want to focus on the impacts to their emergency management resources when there is a need to respond simultaneously to radiological and the natural disaster events.

The INEX 5 generic scenario has been designed around these characteristics and includes:

- A credible outline 'narrative' describing the initiating incident, generic meteorology and incident impact (exercise start);
- Defined source data, an outline contamination 'footprint' and description of the radioactive contamination arising from the delivery mechanism. The footprint will determine the extent of the consequences to be assessed by the Exercise Players.
- A series of 'overlays' that may be used over mapping of a participant country;
- A Master Scenario Event List (MSEL) with examples of driving questions/inputs.

The detailed scenario is provided in Annex 2.

#### 2. How Will National Exercise Organisers Use The Exercise Scenario?

Within each country, the national emergency response arrangements will dictate the scale of exercise required and the level of involvement of national organisations to test the key objectives described in Section 2.1. When combined with the key exercise objectives, NEO/NPCs will be able to determine where

to situate the scenario. From this, the specific MSEL can be developed in order to address the common INEX 5 objectives and evaluation topics, as well as any additional focus areas identified by the country.

Information contained in this scenario may be altered to meet national need, with the exception of the section on “*Ground Truth*”, to ensure that consistent scenarios are used in all countries. The National Planning Team should ensure that all modifications that have been made to this generic scenario in order to define the specific national INEX 5 exercise scenario are reflected in the national INEX 5 Guide for Players.

## ANNEX 2

### DETAILED INEX 5 SCENARIO

#### *Guidance on using the Scenario*

This Annex provides a detailed scenario for National Planning Teams. The information provided is meant to help guide organisers through the planning process.

The National Planning Team should ensure that any modifications made to this generic scenario in order to define the specific national INEX 5 exercise scenario are reflected in the national INEX 5 Guide for Players (*see [NEA/CRPPH/INEX\(2015\)2](#)*).

#### **Scenario Narrative**

*Background (to be provided as participant information prior to the start of the table top and during the exercise)*

One day prior to the start of the Table Top, an event is identified at a Nuclear Power Plant (NPP). For ~ 12 hours the control room operators deal with the sequence of events and the event classification (Alert) does not change. The onsite emergency response organization for response to an Alert is assembled and all emergency response facilities are staffed. No radiological material release has occurred or is expected at this time. Notifications are made to local response organizations, national agencies and regulatory agencies. No offsite protective action recommendations are made. Twelve hours after the initial problems are recognized, the reactor accident sequence continues to deteriorate and the control room continues to monitor the accident. (For countries without NPPs, they may want to consider participating with neighbouring countries with NPPs for receiving and requesting information. Another alternative may be for them to use the non-NPP country addendum scenario where a radiation plum from an NPP source affects their country and (both actual and potential) a large number of the population, thus requiring notification to and support from the local, national and international communities. Initial phase is identification and assessment of the type, amount and spread of contamination). The non-NPP addendum should be used in conjunction with the NPP scenario even if playing without an NPP country.

#### *Immediate Phase (day the table top begins)*

At 0200 (about 24 hours after the initial Alert notification) the NPP accident conditions have continued to worsen with a radioactive material release expected by mid-morning. A natural disaster event occurs near the plant (approximately 6 km away). Based on the potential impacts created by the natural disaster, the control room operators reassess the damage and determine the status of the NPP, based on instrumentation, which a release of radiological materials is likely to occur within 4 hours. The release will be of a magnitude to require offsite protective action recommendations. This meets the middle level of notification and response (Site Area Emergency). (This takes into consideration a 3-level emergency response model. It could be bypassed and go straight to the General Emergency.)

The NPP onsite organization initiates actions according to their emergency procedures and begins notifications to their emergency response staff. Communication systems are down and not all notifications to NPP emergency response staff and the local authorities are possible due to impacts from the natural

disaster on the local infrastructure. The natural disaster causes significant damage to the local area and there are many serious injuries and deaths. Local response capabilities (police, fire, ambulance and other emergency responders) are responding to the community needs. There is loss of power to about 60% of the area around the NPP site (about 15 km radius) and some communications systems are down. (For non-NPP scenario - A natural disaster disrupts identification and assessment activities and spreads the contamination into unknown areas.)

At 0300, effects of the natural disaster create additional problems for Unit 1 and a fire breaks out in an area where people are located. There are some radiologically contaminated injuries and at least one casualty.

At 0310, the fire and the potential for radiological release due to degradation of plant systems result in the control room operators assessing the situation and making notification according to established procedures as the highest impact level (General Emergency). Activation of the full NPP emergency response organization and protective action recommendations for emergency planning zones notifications for offsite agencies are initiated. Notifications are attempted to be made to the required NPP, local and State/National officials. NPP, local and State/National emergency response organizations begin activation of their centres, or adding the nuclear component to the already established organization (if activated for the natural disaster event). Local and State/National decision makers who have been able to reach the emergency centres begin to, or continue to, gather information, take actions and provide information to the public related to known or unknown protective action recommendations (including emergency planning zones).

At 0315, the offsite emergency response agencies are requested to assist in handling the onsite contaminated injuries and casualties and support the fire response at Unit 1.

At 0325, communications systems are found to be limited, even with backup systems being employed. Status of the effectiveness of the protective action recommendations notifications and response by the NPP emergency response organization and local emergency response services are unknown.

At 0400, some local offsite response agencies/emergency centres begin confirming protective action recommendations and requesting aid from state or regional areas beyond the natural disaster impact area. State/National emergency organizations begin addressing requests from the local response agencies/emergency centres.

At 0500, a release of radioactive material begins at NPP Unit 1. Initial expectation is that the release could last an hour. Monitoring data is limited and not confirmed. The level of radioactive material being released is initially thought to be minimal and limited to an area no of more than 3 km from the NPP site. This information is communicated to the local, State/National emergency response organizations and neighbouring countries and international organisations as communication systems limitations allow. State/National emergency response organizations make decisions and initiate actions based on minimal or non-existent data. Neighbouring countries, IAEA, WHO and WMO request information.

At 0600, offsite infrastructure failures result in lack of services. Hospitals and evacuation centres are overcrowded and not confirmed as safe following the natural disaster and potential impacts from the release of radioactive material. Requests for information and offers of support from the international communities begin to come in through embassies, the IAEA, neighbouring countries, etc.

### ***Intermediate Phase***

About 8 hours after the initial release starts, the radiological release estimate is determined to be 10 times larger than expected and is continuing. This impacts a significantly larger area and population and

creates concerns by the international community (could include contamination of neighbouring countries). Monitoring resources continue to be limited and inadequate. Onsite and offsite resources are still limited and communication resources are still unreliable, status of evacuations is still unknown, support for the onsite fire and decontamination of contaminated people is underway. State/National coordination and support activities include: establishment of a media area (joint information centre); communicating (including data exchange) with other State/National agencies, embassies and the international community; providing needed support to the NPP and local agencies for response to and recovery from the natural disaster event. The NPP emergency organization is deploying staff to gather data (plant and field data), interpreting the data and providing information (and recommendations) to the State/National emergency response organization.

About 3 days after the natural disaster occurs, the nuclear event is under control. Unit 1 has been stabilized and the release has stopped. Early assessment of reactor damage is being made. Characterization of the offsite radiological impacts is underway (extent of the area and contamination levels, food and water supplies, mitigation needs, exports, tourism, health, psychological, etc.). Assessment of the natural disaster impacts is continuing. Communication systems are fully restored. Onsite and offsite emergency response centres/organizations continue to work through issues as they come up. State/National emergency response organization determines (with NPP for nuclear support) what international support is needed, how to get it and how to manage it when it arrives. International support begins arriving.

#### **Moderator Actions / Questions**

- To be discussed by each participant: NPP, local, State, National, International as appropriate. (organizations may or may not have actions so a “no action” statement could be appropriate)
- Release(s) need to be within the range of the country’s established procedures/protocols that requires notifications to local, national and international organizations as the event unfolds.
- Organizations should use their established protocols/policies/procedures for responding to the questions.
- Differing expectations and understandings should be discussed briefly and captured for further review as a part of the lessons learned and program improvement activities.
- Countries may consider using video conferencing as a tool for interaction, as well as face-to-face settings for conducting the tabletop.

#### **Objective to Consider**

- **Notifications to be made and to whom**
- **Local, State/National, and NPP management actions**

- (1) NPP – Who/what process is responsible for determining the event classification? What notifications have been made for this classification? What is the time-frame for making notification? To who were the notifications made? What notification actions are taken, and to whom, when the event classification escalates (site area and general)?
- (2) Local, NPP HQ, Regulators, others – Who in your organization receives NPP notifications? What actions are taken at this classification level?

- (3) For non-NPP scenario's the agencies responsible for identifying the problem and for notifying others should answer the same/similar questions.

#### **Intermediate Phase (Day the Table top begins)**

- **Communication issues due to outages**
- **Incorrect information due to lack of early data**
- **Decision making by the site and local authorities**
- **Protective Action Recommendations**
- **Notifications to Site, local, State/National, Neighbouring countries and internationally**

- (1) NPP – What is in place to ensure communication systems are available within the NPP and between the NPP and notification points? Are there contingency plans in place if normal communication systems are down, and if so, what are they? What information related to radiological events do you provide to the local agencies/community? What radiological support do you provide to the local agencies/community? What support for radiological emergencies do you request/expect from NPP management, local, State/National, International agencies and how do you get it? What protective action recommendations are provided and to whom? How is incorrect information related to a radiological event identified and corrected?
- (2) Local agencies - What actions are in place to maintain communications during a natural disaster? What support for response to a radiological emergency do you receive/expect from the NPP, State, National organizations? What decisions are you responsible for during a radiological event? How is incorrect information related to a radiological event identified and corrected?
- (3) Local residents – What information has been provided to residents related to actions for response to NPP events? What information regarding the radiological event has been provided / received?
- (4) State/National - What actions are in place to maintain communications during a natural disaster? What support for response to a radiological emergency do you receive/expect from the NPP, Local, International organizations? What decisions are you responsible for during a radiological event? How is incorrect information related to a radiological event identified and corrected?
- (5) International - What actions are in place to maintain communications during a natural disaster? What support for response to a radiological emergency do you receive/expect from NPP, Local, State, National organizations? What decisions are you responsible for during a radiological event? How is incorrect information related to a radiological event identified and corrected?

For all – How do you respond to both the NPP radiological event and the natural event needs?

- **Concern for continued safety of NPP**
- **Uncertain how to deal with casualties**
- **Early misinformation provided by media locally, nationally and internationally**

- (1) NPP – How are contaminated employees and casualties handled?
- (2) Local agencies – How are contaminated residents handled?

- **Inability to successfully make PAR with adequate information based on common issues and lack of information due to loss of power and monitoring systems failures**
- **NPP, Local and State/National decision makers have minimal, and not necessarily confirmed, information and data from the NPP site**

- (1) NPP, NPP HQ and Regulatory Agencies – How are notification actions confirmed? What actions are taken when there is limited information available from the NPP site and by whom?
- (2) Local, State/National - How are notification actions confirmed? What actions are taken when there is limited information available from the NPP site?

– **Request of offsite resources that are already responding to local events**

- (1) Local emergency response agencies – How do you receive notification/request for service and from whom? What is in place for responding to fires at the NPP, including any training for response to radiological events? How are radiologically contaminated injuries and casualties handled?

– **Some local authorities able to make recommendations to the public**

- (1) Local Authorities – What protective action recommendations are being made to the public?  
 (2) How are they made and by whom?  
 (3) How are results of protective action recommendations to residents and the public confirmed?

– **Requests for assistance with fire, police, rescue and people to aid evacuees**  
 – **Resources to deal with monitoring for and dealing with contaminated people**  
 – **State/National decision makers have minimal, and not necessarily confirmed, information and data from the NPP site and offsite affected areas**

- (1) NPP and Evacuees (residents) – How are requests made for fire, police, and rescue when communication systems are unreliable?  
 (2) Local Authorities – What resources are available for responding to radiological events and how are they obtained? What aid is requested from State/National agencies and who is responsible for asking and tracking the results of the request?  
 (3) State/National Decision Makers – What decisions are made for response to the radiological event? How do those decisions coordinate with the natural event decisions? What decisions are made/actions taken if minimal information is available regarding the NPP event? What triggers the request for international assistance? Who is responsible for requesting and tracking the results of the request?

– **Address who is in charge due to NPP accident and natural disaster**  
 – **Continued misinformation disseminated by media**  
 – **State/National decision makers still have minimal, and not necessarily confirmed, information and data from the NPP site and offsite affected areas**  
 – **Information needs of neighbouring countries and IOs**

- (1) NPP – Who has the ultimate responsibility for actions at the NPP site? What notification/communication is made for expected and actual radiological releases? By whom and to whom?  
 (2) Local – Who has the ultimate responsibility for oversight of local activities? How are media requests and reports handled? Who is responsible for watching media reports? How is misinformation handled and by whom?  
 (3) State/National – Who has the ultimate responsibility for oversight of State/National activities? How are media requests and reports handled? Who is responsible for watching media reports? How is misinformation handled and by whom?  
 (4) Neighbouring Countries – What policies are in place with neighbouring countries? How is information shared and when?  
 (5) International – What organizations are asking for information? What organizations are being provided information and by whom? What processes are in place for handling/notifying international residents and tourists?

- **Communication with state, regional and national authorities hampered. Loss of roads, bridges, airports impacts receiving aid**
- **State/National decision makers begin to address international requests for information & data and offers for assistance**

- (1) Local Agencies – How are reports of the extent of damage to infrastructure obtained and who is the information reported to? How are damage reports coordinated with radiological monitoring team activities?
- (2) State/National Agencies – How are Local agency damage reports factored into State/National activities? What processes are in place for addressing International requests for information? Offers for assistance? What processes are in place for requesting international support? What support is established and provided for Local radiological activities?

#### **Intermediate Phase**

- **Information on regional and national level imperfect. International interest elevating**
- **Contacts and sharing of information with international agencies and governments**
- **Responsibility for determining that information is accurate before release vs. lack of any information**
- **State/National decision makers continue to address issues and provide guidance to the country and provide event status information to the international community**

- (1) NPP – What work schedule has been established for plant workers? How is additional staff obtained? What discussions are going on with NPP HQ regarding the expanded affected area and amount of radiation?
- (2) NPP HQ – What information is requested from the NPP? What actions are taken if the information is not readily available? What information is being requested from State, National, Stakeholders, others? How is information to the media being coordinated within NPP HQ and between NPP HQ and State/National organizations? What, if any, international resources are normally available to NPP HQ? Where are international resources obtained, and how are they obtained during normal conditions? Where are international resources obtained, and how are they obtained during emergency conditions? Who is responsible for establishing contact, requesting support and tracking receipt of that support?
- (3) Local – What support is being requested (by whom and to whom)? How is the increased radiation level affecting the response activities? What notifications are being made to residents and by whom?
- (4) State/National – What information is requested from NPP HQ? What actions are taken if the information is not readily available? What information is being requested from NPP HQ, Stakeholders, International, etc. organizations? How is information to the media coordinated and who is responsible for accuracy of the information? What is the process for communicating with citizens and how often? How and what information is provided to embassies?
- (5) International – What organizations will be contacted and what information will be provided? By whom? Are there any international organizations that would be contacting the NPP, NPP HQ, Local, State/National, other organizations and if so who would they be contacting?

- **Effort at national level to correct misinformation and continue to provide national and international information on radiological impacts from the reactor accident**
- **Coordination of offsite aid- International agencies involved in cooperation to provide monitoring and consequence assessment tools and data as well as technical assistance in accident mitigation and investigation**

**– State/National decision makers continue to address issues, provide guidance to the country, identify resources for recovery efforts; and provide event status information to the international community**

- (1) NPP – How are staffing needs being communicated and by whom? If International support has been made available, how is it being implemented and who is responsible for its implementation at the site? Who determines when the support is no longer needed and who is responsible for closeout activities for the International support? What arrangements are in place for, and how and when will, the event investigation be initiated/documentated?
- (2) NPP HQ – What arrangements are in place for obtaining support (personnel and equipment) for the NPP and who are the arrangements with? What arrangements are in place for providing and tracking NPP support needs to completion? What arrangements are in place for, and how and when will, the event investigation be initiated/documentated?
- (3) Local – What is in place for handling resources and support provided by/expected from State/National and International organizations? Have staging locations been identified and if so where are they? How are people displaced by the radiation levels being handled? Who is responsible for maintaining communications and providing direction to them? What arrangements are in place for, and how and when will, the event investigation be initiated/documentated?
- (4) State/National – What are your responsibilities to the Local community from the effects of the radiological release? How are those coordinated with responsibilities from the natural disaster? What is in place for determining recovery actions? What arrangements are in place for, and how and when will, the event investigation be initiated/documentated?
- (5) International – Do you have any responsibilities to the NPP or Country and if so what are they?

## Ground Truth Information

### *Defined Information*

**The following information is standard for all INEX 5 exercises, and should not be modified.**

Below given information describes the health effect consequences associated with a hypothetical unknown release to the atmosphere from a radiological source.

#### ***Ground Exposure Dose Rate at 12 hrs: (Groundshine only)***

Material:  $^{137}\text{Cs} + ^{131}\text{I}$

#### ***Early Phase Iodine Thyroid Blocking: (Projected Dose to the Thyroid Exceeding Generic Criteria)***

Material:  $^{131}\text{I}$

This product identifies projected dose that exceeds the generic criteria of 50 mSv in the first 7 days to the thyroid (urgent). Take protective actions and other response actions early in the response.

#### ***Early Phase Evacuation/Sheltering/Relocation/Food Restrictions: (Projected Total Effective Dose Exceeding Generic Criteria)***

Material:  $^{137}\text{Cs} + ^{131}\text{I} + ^{133}\text{Xe}$

This product identifies projected dose that exceeds the generic criteria of 100 mSv in the first 7 days (urgent) or 100 mSv in the first year (early). Take protective actions and other response actions early in the response.

#### ***Total Deposition***

Material:  $^{137}\text{Cs} + ^{131}\text{I}$

This product identifies the more highly contaminated areas due to fallout and deposition of the radioactive material. This material, depending upon the type of radiation emitted, may continue to give doses to individuals in these areas through inhalation of resuspended radioactive material or from direct external radiation. These levels of deposited radioactivity should be confirmed by monitoring surveys.

#### ***Longer Term Medical Screening: (Total Effective Dose Received Exceeding Generic Criteria)***

Material:  $^{137}\text{Cs} + ^{131}\text{I} + ^{133}\text{Xe}$

This product identifies dose that has been received and exceeds the 100 mSv in a month generic criteria. Take longer term medical actions to detect and to effectively treat radiation induced health effects.

### **SOURCE INFORMATION:**

Source Material and Amount:

Ground Exposure Dose Rate at 12 hrs

Total Deposition

Total Strength for the product(s) listed above =  $1.1 \times 10^7$  Ci

$1 \times 10^6$  Ci of  $^{137}\text{Cs}$  (100% respirable)

$1 \times 10^7$  Ci of  $^{131}\text{I}$  (100% respirable)

Early Phase Iodine Thyroid Blocking

Total Strength for the product(s) listed above =  $1 \times 10^7$  Ci

$1 \times 10^7$  Ci of  $^{131}\text{I}$  (100% respirable)

Early Phase Evacuation/Sheltering/Relocation/Food Restrictions

Longer Term Medical Screening

Total Strength for the product(s) listed above =  $1.11 \times 10^8$  Ci

$1 \times 10^6$  Ci of  $^{137}\text{Cs}$  (100% respirable)

$1 \times 10^7$  Ci of  $^{131}\text{I}$  (100% respirable)

$1 \times 10^8$  Ci of  $^{133}\text{Xe}$  (100% respirable)

Total Strength:  $1.11 \times 10^8$  Ci

Source Geometry:

Point released at 0 m

Particle Size Distribution:

All particulate is in the respirable range from 0.1 to 10 microns

**Not For Public Dissemination**

**Sample INEX 5 Plots**



**Ground Exposure Dose Rate at 12 hrs**  
(Groundshine Only)

Map Size: 58.4 km by 58.4 km Id: IXP.rcE15212.rcC1

Effects and Actions			
	Description	(mSv/hr) Extent Area	Population
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (10 mSv = 1 mrem) 2 mrem/hr is the U.S. NRC limit for public exclusion for a 1 hr or less exposure	>10 2.1 km 1.3 km <sup>2</sup>	0
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (1 mSv = 0.1 mrem)	>1 5.4 km 7.0 km <sup>2</sup>	0
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (0.1 mSv = 0.01 mrem)	>0.10 32.2 km 101 km <sup>2</sup>	0

Note: Areas and counts in the table are cumulative. Population Source = LandScan2005.

Effects or contamination at January 10, 2015 05:39 UTC

**Release Location:** 50.425546 N, 0.593298 E

**Material:** CS-137 + I-131

**Generated On:** January 09, 2015 19:18 UTC

**Model:** ADAPT/LODI

**Comments:**

Release starting at 01/09/2015 17:39:00 UTC for 4 hr

gridded met at 3 hr intervals from 01/09/2015 15:00:00 UTC to 01/10/2015 18:00:00 UTC

**Not For Public Dissemination**

**Not For Public Dissemination**

**Sample INEX 5 Plots**



**Early Phase Iodine Thyroid Blocking**  
(Projected Dose to the Thyroid Exceeding Generic Criteria)



Map Size: 233 km by 233 km Id: IXP.rcE15212.rc1

Actions and Long-Term Effects			
	Description	(mSv) Extent Area	Population
	50 mSv in 7 days - Iodine thyroid blocking (GSG-2, Table 3)	>50 104 km 838 km <sup>2</sup>	36,000
Note: Areas and counts in the table are cumulative. Population Source = LandScan2005.			

Effects or contamination from January 09, 2015 17:39 UTC to January 16, 2015 17:39 UTC

**Release Location:** 50.425546 N, 0.593298 E

**Material:** I-131

**Generated On:** January 09, 2015 19:18 UTC

**Model:** ADAPT/LODI

**Comments:**

Hypothetical release starting at 01/09/2015 17:39:00 UTC for 4 hr

gridded met at 3 hr intervals from 01/09/2015 15:00:00 UTC to 01/10/2015 18:00:00 UTC

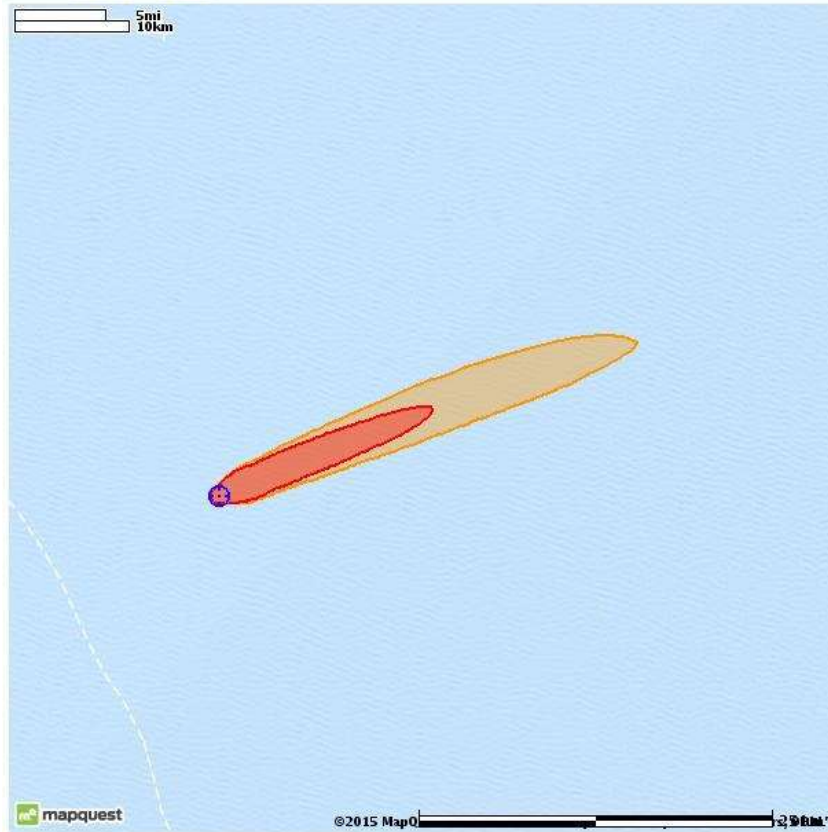
**Not For Public Dissemination**

**Not For Public Dissemination**

**Sample INEX 5 Plots**



**Early Phase Evacuation/Sheltering/Relocation/Food Restrictions**  
 (Projected Total Effective Dose Exceeding Generic Criteria)



Map Size: 58.4 km by 58.4 km Id: IXP.rcE15212.rcC1

Actions and Long-Term Effects			
	Description	(mSv) Extent Area	Population
	100 mSv in first 7 days - Sheltering, evacuation, decontamination; restriction of consumption of food, milk and water, contamination control, public reassurance (GSG-2, Table 3)	>100 16.0 km 30.4 km <sup>2</sup>	0
	100 mSv in 1 year - Temporary relocation, decontamination, replacement of food, milk and water, public reassurance (GSG-2, Table 3)	>100 31.0 km 91.5 km <sup>2</sup>	0

Note: Areas and counts in the table are cumulative. Population Source = LandScan2005.

Effects or contamination from January 09, 2015 17:39 UTC to January 09, 2016 17:39 UTC

**Release Location:** 50.425546 N, 0.593298 E

**Material:** CS-137 + I-131 + XE-133

**Generated On:** January 09, 2015 19:18 UTC

**Model:** ADAPT/LODI

**Comments:**

Hypothetical release starting at 01/09/2015 17:39:00 UTC for 4 hr  
 gridded met at 3 hr intervals from 01/09/2015 15:00:00 UTC to 01/10/2015 18:00:00 UTC

**Not For Public Dissemination**



Total Deposition

Sample INEX 5 Plots



Map Size: 3,906 km by 3,906 km Id: IXP.rcE15212.rcC1

Effects and Actions			
	Description	(MBq/m <sup>2</sup> ) Extent Area	Population
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (100 MBq = 2702 uCi)	>100 30.3 km 90.8 km <sup>2</sup>	0
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (10 MBq = 270 uCi)	>10 159 km 1,610 km <sup>2</sup>	164,000
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (1 MBq = 27 uCi)	>1 745 km 35,526 km <sup>2</sup>	1.69E7
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (0.1 MBq = 2.7 uCi)	>0.10 1,334 km 173,550 km <sup>2</sup>	4.52E7
	No guidelines specified. Possibly contaminated area. Use to confirm with monitoring surveys. (0.01 MBq = .27 uCi)	>0.01 1,845 km 419,623 km <sup>2</sup>	8.71E7

Note: Areas and counts in the table are cumulative. Population Source = LandScan2005.

Effects or contamination at January 10, 2015 17:39 UTC

**Release Location:** 50.425546 N, 0.593298 E

**Material:** CS-137 + I-131

**Generated On:** January 09, 2015 19:18 UTC

**Model:** ADAPT/LODI

**Comments:**

Hypothetical release starting at 01/09/2015 17:39:00 UTC for 4 hr

gridded met at 3 hr intervals from 01/09/2015 15:00:00 UTC to 01/10/2015 18:00:00 UTC

**Not For Public Dissemination**

**Not For Public Dissemination**

**Sample INEX 5 Plots**



**Longer Term Medical Screening**  
(Total Effective Dose Received Exceeding Generic Criteria)



Map Size: 29.2 km by 29.2 km Id: IXP.rcE15212.rcC1

Actions and Long-Term Effects			
	Description	(mSv) Extent Area	Population
	100 mSv in 30 days - Screening based on equivalent doses to specific radiosensitive organs (as a basis for medical follow up), counseling (GSG-2, Table 3)	>100 21.1 km 46.9 km <sup>2</sup>	0
Note: Areas and counts in the table are cumulative. Population Source = LandScan2005.			

Effects or contamination from January 09, 2015 17:39 UTC to February 08, 2015 17:39 UTC

**Release Location:** 50.425546 N, 0.593298 E

**Material:** CS-137 + I-131 + XE-133

**Generated On:** January 09, 2015 19:18 UTC

**Model:** ADAPT/LODI

**Comments:**

Hypothetical release starting at 01/09/2015 17:39:00 UTC for 4 hr

gridded met at 3 hr intervals from 01/09/2015 15:00:00 UTC to 01/10/2015 18:00:00 UTC

**Not For Public Dissemination**

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**ANNEX 3****MASTER SCENARIO EVENTS LIST*****Guidance on using the MSEL***

To follow the scenario information above and drive exercise play, exercise moderators will present players with a series of scenario updates and specific discussion questions (the MSEL), in accordance with the exercise timeline.

The time column is in the format Time of Event (E) –or + Days: Hours: Minutes. Participants can set their own time of detonation and adjust the inject times as appropriate. Injects have been created based on the INEX 5 objectives, therefore, much of the initial on-scene response has been omitted. Not all injects will be applicable to all participants. Injects may be deleted as necessary.

It is important to note that the details of the scenario updates and the list of questions are neither definitive nor exhaustive, and may need to be adjusted or supplemented in advance in accordance with expected exercise participation, in order to appropriately address the topics and support the completion of the INEX 5 evaluation questionnaire. During exercise play, moderators also may be required to formulate subsequent supporting questions based on exercise feedback. Such questions, as well as any topics or issues given specific focus, should be recorded as part of the exercise recording and evaluation. Planners and moderators should be aware that some issues, such as stakeholder feedback and economic issues, may be cross-cutting and may therefore appear in the discussions of multiple topics.

Time	Topic	Description	Expected Actions / Discussion Points	Questions	Comments
	Background	Setting up the information necessary for players to begin from		To be asked of each participant: NPP, local, State, National. ( <i>orgs may or may not have actions so a "no action" statement could be appropriate</i> )	
		Radioactive release expected	Release expected within 4 hours	Prior to the natural disaster (e.g., earthquake), with the knowledge that a release is expected within 4 hour, what notifications have been made and what notifications are anticipated to be made? ( <i>procedures</i> ) What is the identified timeframe for making those notifications? ( <i>procedures</i> )	Release is expected to be enough for Site Area notifications. ( <i>This event needs to be based on the individual countries notification limits. The reason for the release is not important because the notification and resulting response actions are what's important.</i> )
0200		Natural Disaster happens ~ 6 km away	NPP onsite org determines people to notify but communications are limited between NPP and local authorities (and their own people)	What actions are taken to maintain communications during a natural disaster? ( <i>procedures and technical practices (backup systems) in place for handling such events</i> )	
		Local response org are responding to the community needs	60% power loss (60% of the people) out to 15 km without power. Local agencies are overwhelmed	What actions are being taken by community organizations? What information has been provided to the agencies and residents of the community? What, if any, preparations (drills/exercises) are available to the	

				local communities and residents. How is back up support identified and obtained?	
0300		Fire breaks out within the NPP and people are hurt and radiologically contaminated. One causality.		What actions ( <i>procedures</i> ) are taken for handling radiologically contaminated employees and casualties? What notifications are made, and to whom, for radiologically contaminated employees and casualties? What actions are taken by those receiving notification of radiologically contaminated employees and casualties? ( <i>Emergency services, hospital, NPP management, etc.</i> )	
0310		Control room operators make General Emergency notifications	Protective Action Requirements (PARs), notifications for full NPP EP teams made, NPP, local, national	How do you confirm that notifications are/have been made? What actions are taken when team members or agencies cannot be notified or when notification confirmation is not received?	
		NPP, local, national emergency centres activated/notified	Local, national centres start public notifications related to event (maybe or maybe not NPP info)	What activation and notification actions are taken with regard to the natural disaster? What activation and notification actions are taken with regard to the General Emergency notification?	
0315		Onsite is requesting support from offsite emergency response agencies		What is in place to request offsite support and what kind of support is being requested? Who is responsible for making those requests and how is the requested support coordinated at the	

				NPP?	
0325		Communications are limited and unknown	How much info is known by the local and national agencies based on a NPP General Emergency?	Based on a General Emergency notification, what actions are taken? What processes are in place to contact the NPP? (Is there a process in place to contact the NPP, instead of waiting for notification?) Is there anything in place for the community to “assume” a General Emergency at a NPP as a result of a natural disaster?	Are they consistent among agencies?
0400		Some local offsite agencies are confirming PAR results. State/National help is requested.		How is State/National support requested? How is State/National support received and coordinated at the event scene and within the community?	
0500		Radioactive release begins (level of radiation material thought to be minimal -3 km- and not expected to last more than an hour)		What actions are happening at the NPP? What notifications are being made and by whom?	
		Local, State and National and neighbouring countries begin receiving information and taking actions based on minimal and non-existent information		How do you validate information? What actions do you take when there is little to no information? How are your notifications received (fax, phone, email) and from whom at the NPP? Are there standard forms? What information do you expect to receive? What actions do you take for a General Emergency notification?	
0600		Offsite services info failures, hospitals overwhelmed, etc.		What contingency plans are in place for infrastructure services? How	

				<p>are they implemented?                  What is in place for the hospitals to handle radiologically contaminated patients?                  What is in place for handling displaced people?                  What is in place for long-term displacement?                  What legal policies are in place for NPP events? For natural disasters?</p>	
		Offers of support from neighbouring countries begin to arrive from the embassies		<p>What policies/procedures are in place for asking for and accepting support from international communities?                  What processes are in receiving support?                  What are the established communications with neighbouring countries and the international community for events involving potential radiological impacts (both to and from)?                  What procedures are in place for establishing and maintaining contacts and how often are they tested?</p>	
1000		Radioactive release is significantly larger and further out than originally thought. Field teams deployed. Joint Information Centre (JIC) established.		<p>What procedures are in place for field teams?                  Are there monitoring stations around the plant and if so, how are the readings captured?                  Are there standard routes for the field teams?                  What equipment (monitoring and communication) do the field teams have?</p>	

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				<p>What information is communicated (both to and from the field teams)? Who participates in the JIC? How is information coordinated among agencies? How is information received/communicated and from/to whom? Who has responsibility for communication with the international community? What protocols are in place for time and type of communications? How do international visitors and locals receive information?</p>	
3 days later		International support arrives.		<p>What processes are in place for receiving international equipment and personnel? How is support coordinated between radiological and humanitarian needs? How does the power plant get international help and resources?</p>	

*Non-NPP Country Response Scenario/Timeline, Objectives and Moderator Questions*

- **Non-NPP Country is Not Initially Impacted** – Neighbouring country NPP is experiencing an Alert level event (problems with the reactor but without threat of a release outside of the facility) happening at a neighbouring country's NPP. Expect that notifications are made per NPP procedure if known. If not known, identify the non-NPP country expectations for the type of information anticipated, the method and timing of its delivery and the entities within the non-NPP which should be receiving it.
- **Non-NPP Country is Potentially Impacted** – Sometime later (about 12 hours) the NPP realizes that a release is imminent and declares a Site Area emergency (release outside the facility but within the site boundary). There is still no expected impact to the non-NPP country however the event escalation is expected to trigger additional notifications. Sometime after the Site Area emergency notification is completed (about an hour), a natural disaster occurs near the NPP which creates an unknown radiological release and results in the NPP declaring a General emergency event (release beyond the site boundary). Expect that notifications are made per NPP procedure. Assume that communication systems from the NPP may not be reliable due to natural disaster.
- **Non-NPP Country is Actually Impacted** – The NPP declares a General emergency event (release beyond the site boundary) based on a confirmed release, but unknown/not verified source term values. The plume is moving toward or has already reached the non-NPP country border. Potential consequences are unknown (both for NPP and non-NPP countries). The natural disaster (e.g., earthquake) impacted non-NPP country residents, so in addition to responding to the radiological plume from the NPP, the non-NPP country leaders are also responding to the needs of the residents from the natural disaster. Assume that communication systems within the non-NPP country may not be reliable due to natural disaster damage.

The Scenario Timeline does not include specific times or specific events because the objective of this Tabletop exercise is to identify and clarify response needs for countries without NPPs, but which may be impacted by a radioactive material release from another country's NPP event.

The Potentially Impacted scenario is recommended for countries without well-established radiological response plans and procedures who want to focus on the response to the radiological aspects of an event.

The Actually Impacted scenario is recommended for countries with well-established radiological and natural disaster response plans and procedures who want to focus on the impacts to their emergency management resources when there is a need to respond simultaneously to radiological and the natural disaster events.

Scenario Timeline	Objectives	Moderator Questions		Actually Impacted
		Not Impacted	Potentially Impacted	
Participant discussion of Tabletop process and set up information (scenario background)	To identify and clarify response needs for countries without NPPs, but which may be impacted by a radioactive release from another country's NPP event. To identify areas of improvement for non-NPP country's ability to respond to both radiological and natural events.	No radioactive release has occurred; however there is an event happening at the bordering country's NPP. (Alert level event) A radioactive release has occurred at the NPP; however it is not expected to impact the non-NPP country. (Site Area level event)	A radioactive release has occurred at the NPP; however it is not expected to impact the non-NPP country. (Site Area level event) Impacts from an earthquake are significant for the NPP country and there is an unknown radioactive release from the NPP that is expected to impact the non-NPP country. (General level event)	Impacts from an earthquake are significant and there is a confirmed release, but unknown/not verified source term values from the NPP that will impact the non-NPP country. (General level event) The non-NPP country residents have also been impacted by the earthquake.
Initiating event	Identifying and understanding the notification processes for a potential radiological release from another country's NPP event.	Would you expect to be notified of an Alert level at a neighbouring country's NPP? If so, how and who gets notified? What information would you expect to receive? What would your actions be, based on the information received? Would you inform residents? If so, what information would be provided? Are there established templates and processes for providing radiological and non-radiological event information to the public?		
Initiating event		What are your actions if you hear information about an NPP event happening in a neighbouring country from the media or social media networks? What method do you have for verification of media		

Scenario Timeline	Objectives	Moderator Questions		
		Not Impacted	Potentially Impacted	Actually Impacted
		information?		
Escalating event (continued deterioration of the reactor)	Identifying and understanding the notification processes for an escalating radiological event from another country's NPP	<p>Do you have emergency response plans and procedures for responding to a radiological event (Impacts from an NPP event, lost source, terrorist event, etc.)?</p> <p>Would you expect to be notified of a Site Area emergency? If so, how and who gets notified (local, national, international)?</p> <p>What would their actions be?</p> <p>What equipment, supplies and professional expertise regarding radiological events do you have?</p> <p>What, if anything, would you expect or require from the NPP country, other countries or international agencies?</p>		
Escalating event		<p>What are your actions if you hear information about an NPP event happening in a neighbouring country from the media or social media networks?</p> <p>What method do you have for verification of media information?</p>		
Earthquake	Identifying and understanding your country's processes and systems for responding to a radiological event from another country's NPP with or without experiencing a natural disaster within your own country.		<p>Would you be notified of the earthquake and disruption of the reactor from the other country's NPP? If so, how and who would receive the notification?</p> <p>What method(s) of notification would you expect to receive (phone, media,</p>	<p>Would you be notified of the earthquake and disruption of the reactor from the other country's NPP? If so, how and who would receive the notification?</p> <p>What method(s) of notification would you expect to receive (phone, media,</p>

Scenario Timeline	Objectives	Moderator Questions Not Impacted	Potentially Impacted	Actually Impacted
			<p>social network, computer, etc.)?                      How would you communicate information to the public?                      Have you considered public protective actions for a potential radiological release impacting your country? If so, what would they be? How were/would they be developed? Are they pre-established to the extent possible?                      Have they been coordinated with local, national and other international agencies?</p>	<p>social network, computer, etc.)?                      Do you have backup communication systems or processes? If so, describe them.                      How would you communicate information related to both the earthquake and the radioactive plume and fallout to the public?                      Have you considered public protective actions for a radiological release impacting your country? If so, what would they be?                      How were/would they be developed? Are they pre-established to the extent possible?                      Have they been coordinated with local, national and other international agencies?</p>
	<p>Identifying actions required for handling a release from another country's NPP with or without your own country's natural disaster.</p>		<p>You are not directly affected by the earthquake; however the radioactive release is coming your way based on wind direction, but has not reached your border yet.                      What are your actions for radiation levels that have the potential to be 0.01 mSv/hr, 0.1 mSv/hr, 1 mSv/hr and 10 mSv/hr (or whatever your country levels are)?                      What are the criteria for establishing emergency centres, making notifications, establishing relocation centres, obtaining additional emergency services (medical, law, fire, etc.), obtaining national and international capabilities, etc.?                      How do you notify local, national and international organizations?</p>	<p>You are trying to recover from the earthquake as well as deal with the radioactive release which is impacting your country. What are your actions?                      How are response priorities established?                      What are the criteria for establishing emergency centres, making notifications, establishing relocation centres, obtaining additional emergency services (medical, law, fire, etc.), obtaining national and international capabilities, etc.?                      How do you notify local, national and international organizations?                      What information is being provided and by whom? Explain how resources are divided between the</p>

Scenario Timeline	Objectives	Moderator Questions		
		Not Impacted	Potentially Impacted	Actually Impacted
			<p>What information is being provided and by whom? Who has ultimate decision making responsibilities for actions during this type of emergency and who is responsible for implementation of those actions?</p> <p>Is there a process for identifying backup for the ultimate decision-maker?</p> <p>Is it written in procedures? If so, how is it maintained currently?</p>	<p>earthquake response and the radiological release response when the radiation level has the potential to be 0.01 mSv/hr, 0.1 mSv/hr, 1 mSv/hr and 10 mSv/hr (or whatever your country levels are).</p>
	<p>Identify and explain the ability to perform or obtain consequence assessment activities.</p>		<p>Do you have the ability to perform consequence assessment such as running models and coming up with projections? If so, explain the process.</p> <p>Do you have the means for radiological monitoring? If not, could you request consequence assessment and radiological monitoring? If so, who would you ask and how would you obtain the resources?</p> <p>Are there contracts or MOUs in place or would they need to be developed? Who would be responsible for that and how long would it take to implement?</p>	<p>Do you have the ability to perform consequence assessment such as running models and coming up with projections? If so, explain the process.</p> <p>Do you have the means for radiological monitoring? If not, could you request consequence assessment and radiological monitoring? If so, who would you ask and how would you obtain the resources?</p> <p>Are there contracts or MOUs in place or would they need to be developed? Who would be responsible for that and how long would it take to implement?</p>
	<p>Identify and explain the ability to perform or obtain contamination control activities.</p>		<p>What measures do you have or could you obtain for contamination control? Explain how they would be implemented.</p>	<p>What measures do you have or could you obtain for contamination control? Explain how they would be implemented.</p>
	<p>Identify and explain radiation protection resources and activities.</p>			<p>What radiation protection measures do you have for emergency responders (police, medical, fire, maintenance crews, etc.)?</p>

Scenario Timeline	Objectives	Moderator Questions		Actually Impacted
		Not Impacted	Potentially Impacted	
				<p>What radiation training is provided to emergency workers and when?</p> <p>What is in place for surveying and management of contaminated crops or other food goods?</p> <p>What is in place for conducting environmental surveys?</p> <p>What is in place to communicate the level of impact to crops and other food goods?</p>
	<p>Identify and explain other considerations for planning for, response to and mitigation from a radiological release from another country's NPP event.</p>		<p>What is in place to manage public, national and international perceptions that crops may be radiologically damaged even though there was no actual damage?</p>	<p>Has a public education program on radiation been developed and implemented? If so, explain.</p> <p>What is in place to handle long-term health assessments for those affected by a radiological release or natural emergency event? How is the public informed about the implementation process?</p> <p>Is there a process for whole body counting for concerned residents? If so, explain.</p> <p>What is in place for replacement housing, should it be necessary?</p> <p>What compensation regulations are established for both earthquake damage and radiological impacts?</p>