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Working Party on Nuclear Emergency Matters

INEX 4
GUIDE FOR NATIONAL PLANNING COMMITTEES
(EXERCISE ORGANISERS, MODERATORS and EVALUATORS-RECORDERS)

INEX 4 Exercise on
Consequence Management and the Transition to Recovery

INITIAL DISTRIBUTION: RESTRICTED TO INEX 4 NATIONAL PLANNING COMMITTEES (including Exercise Organisers, Moderators, Evaluators-Recorders)

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**INEX 4 EXERCISE ON CONSEQUENCE MANAGEMENT
AND THE TRANSITION TO RECOVERY:
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 (OECD/NEA) has developed the INEX 4 Exercise on Consequence Management and the Transition to Recovery, to be conducted over a period of several months beginning in the latter part of 2010. 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 INEX 4 exercise. It describes the INEX 4 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 4 exercise.

This document is part of the set of generic INEX 4 Technical Materials prepared by the OECD/NEA. The National Planning Committee members should familiarise themselves with the content of all documents in this set, which include:

- INEX 4: General Information (NEA/CRPPH/INEX(2009)6)
- INEX 4: Guide for National Planning Committees (NEA/CRPPH/INEX(2009)7) [*this guide*]
- INEX 4: Guide for Exercise Players (NEA/CRPPH/INEX(2009)8)
- INEX 4: Exercise Evaluation Questionnaire (NEA/CRPPH/INEX(2009)9)

1.2 Background and Overview of the INEX 4 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.¹ The last series, the INEX 3 consequence management exercises conducted during 2005-2006, investigated arrangements for responding to widespread radiological contamination of the environment arising from a radiological emergency (NEA 2007a). The value brought by INEX 3 in terms of experience, lessons and identified issues has prompted the NEA, through its Working Party on Nuclear Emergency Matters (WPNEM) to develop a new exercise series, INEX 4, to continue the investigation of longer-term emergency management and address areas of current interest.

¹ Further information on the NEA's emergency management programme: <http://www.nea.fr/html/rp/wpnem.html>

As such, the basic concept for INEX 4 is to i) conduct a series of national exercises addressing issues in post-crisis consequence management and the transition to recovery (e.g., health, critical infrastructure, environment, economics, etc) arising from a malicious act involving a radiological dispersion device (RDD) in an urban area and ii) exchange the resulting experiences amongst participants and other interested parties. While the impacts of the scenario and their management are expected to be largely local or national in nature, there will be many issues with international scope, including communication and coordination, movement of people and goods, transfer of contamination, requests and provision of assistance, etc. Thus, INEX 4 will also include a focus on international interfaces and the involvement of relevant stakeholders to the extent feasible.

While planning for nuclear power plant-based scenarios are general well advanced nationally and internationally, the use of a scenario based on an RDD in an urban area responds to the WPNEM's desire to investigate and exchange experience on arrangements for such scenarios. The benefit and goal of INEX 4 is therefore to provide a basis for enhancing national and international emergency management arrangements for such events through the exchange of exercise outcomes and experiences from participating countries, in order to identify good practice and common issues to be addressed.

INEX 4 will be conducted as a series of individual national table-top exercises in order to provide a convenient means for participating countries to test or investigate their own national arrangements, and through broader international experience exchange, identify common issues and facilitate compatibility at the international level. As with previous INEX exercises, INEX 4 includes two stages. First, using the generic technical materials developed by the INEX 4 Planning Group, each participating country through its designated National Exercise Organiser and National Planning Committee will organise an issues-driven tabletop exercise, generally of 1-2 days duration. Each exercise will be based on the standard urban contamination footprint scenario, described later. Exercise play and discussions will focus on the national arrangements or approaches for consequence management and the transition to recovery relevant to the scenario, on the types of decisions and actions to be taken, including international interfaces, and on possible areas for improvement. Importantly, *the early crisis phase of the event will not be exercised.*

Countries may choose when to conduct their exercises within a common window of several months beginning in the latter part of 2010. Following its exercise, each country will complete a standard questionnaire to capture observations, lessons and issues for submission to the WPNEM's INEX 4 evaluation group. This feedback will form the basis of the follow-up INEX 4 International Evaluation Workshop, being organised by NEA for late 2011 after completion of all national 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 phase response arrangements, consequence management and the transition to recovery exercises, particularly urban-based, still present some challenges. INEX 4 is therefore intended to provide a convenient and efficient means of investigating issues in the intermediate and longer term management of these types of events. As such, the INEX 4 exercises will begin after the early crisis phase has ended, minimising the focus on the crisis management and criminal justice aspects of the scenario. As INEX 4 has been designed to exclude the early crisis phase, including notification, materials to support early phase play have not been developed. INEX 4 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 4 is *not* a real-time command-post exercise involving multiple countries. Rather, it is comprised of a series of national exercises conducted individually by interested countries. To assist National Exercise Organisers in planning a national exercise, the INEX 4 Planning Group has prepared a set of technical materials describing the common INEX 4 framework for exercise planning, conduct and evaluation. 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 4 exercise, it is recommended that all participants first conduct individual national exercises to support the common exercise evaluation.

INEX 4 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 arrangements and approaches for consequence management and transition to recovery 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.

While it is acknowledged that there will be an interface in many countries between criminal justice and emergency management for malicious events, INEX 4 is intended to focus on the consequence management aspects presented by these scenarios. As such, topics and questions addressing security and criminal justice are considered out of scope of the common exercise framework and have not been explicitly included in the technical materials or evaluation questionnaire. *However, this does not preclude countries, if they so desire, from more closely examining these aspects under their own initiative and in a manner consistent with the framework.* In such cases, countries may add additional topics or questions as deemed appropriate to their own national exercise planning, participation and conduct, without requirement to include these outcomes as part of the common exercise evaluation questionnaire.

1.4 Who Should Participate in INEX 4?

INEX 4 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 4 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 4 scenario. The extent of participation within a country will be the choice and responsibility of each country.

NEA has informed and invited the participation of relevant international organisations (IAEA, WMO, WHO, FAO etc.) through the Inter-Agency Committee for Radiological and Nuclear Emergencies (IACRNE). Each interested 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 4 framework, the INEX 4 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/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 4 Technical Materials, described below, will enable the NEO/NPCs to develop their specific exercise arrangements within the INEX 4 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; common exercise scenario and Master Scenario Event List (MSEL) with examples of driving inputs; and 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, the technical materials for future consequence management exercises.

Each participating country should base their national exercise on the INEX 4 key and detailed objectives, common scenario and topic areas. However, it is recognised that the national requirements for a consequence management exercise may differ between countries not least regarding the use of a common 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 4 framework, and include any additional topics and questions as deemed appropriate.

INEX 4 Generic Technical Materials

The following documents comprise the full set of generic INEX 4 Technical Materials. Additional strategic guidance on exercise planning can be found in the NEA report “Strategy for Developing and Conducting Nuclear Emergency Exercises” (NEA 2007b).

a) INEX 4: General Information (NEA/CRPPH/INEX(2009)6)

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 4 exercise. While primarily intended to facilitate decisions by those organisations responsible for national exercise programmes on national participation in the INEX 4 exercise series, it also serves as a basic information document on the exercise.

b) INEX 4: Guide for National Planning Committees (NEA/CRPPH/INEX(2009)7)

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 4 exercise. It describes the common INEX 4 framework, including the objectives, topic areas, scenario and recommended exercise format, and an outline of the resources that will be likely to be required from each participating country to prepare for and implement their exercise.

c) INEX 4: Guide for Exercise Players (NEA/CRPPH/INEX(2009)8)

This document provides general guidance to exercise players on participation in their country’s INEX 4 exercise, and is intended to be read in conjunction with the INEX 4: General Information document.

d) INEX 4: Exercise Evaluation Questionnaire (NEA/CRPPH/INEX(2009)9)

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 4 Evaluation Group to compare the national exercises outcomes with regard to the common objectives and topic areas.

2. PLANNING AN INEX 4 EXERCISE

The INEX 4 Technical Materials aim to provide broadly applicable guidance to exercise organisers and participants to ensure a common approach to exercise 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 4 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 INEX 4 exercise, including the roles and responsibilities of the various members of the national planning committee.

2.1 INEX 4 Objectives

The main goals of INEX 4 are to allow participating countries to *i*) test or identify elements for improving their arrangements for consequence management and transition to recovery in response to a malicious event involving dispersion of radioactive materials in an urban area (affecting people, critical infrastructure, environment, economics, etc), and *ii*) exchange experiences with other countries that have conducted an INEX 4 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 consequence management and the transition to recovery;
- Review and share information on approaches to consequence management and the transition to recovery, in order to identify good practice and to allow review and improvement of national and international arrangements; and
- Identify key areas and approaches to international coordination and communication in order to provide a basis for improvements in international emergency management systems.

It is recognised that the scope of response to an urban-based malicious event may be broad. Therefore, to present a manageable exercise from the perspective of planning and conduct, the following specific **topical areas** have been elaborated:

1. Decision-making on protection strategies for consequence management and the transition to recovery, including issues in:
 - optimisation (including technical, economic and social factors);
 - implementation and termination of countermeasures ;
 - communication and coordination between countries and international organisations, including:

- communication arrangements (capability, willingness and practical ability to exchange information);
 - understanding of the emergency situation;
 - recommendations for protective actions;
 - communication of recommendations for protective actions;
2. Public health, including issues in information and communication;
 3. Monitoring and assessment, including capability assessment;
 4. Safety and security of populations and infrastructure, including
 - population control (police command and control);
 - population management;
 5. Planning for recovery, including:
 - clean-up and waste management;
 - stakeholder involvement².

These 5 topics, which will be evaluated from both a national and international perspective, form the basis of the generic exercise MSELs and evaluation questionnaire.

2.2 Exercising the INEX 4 Objectives: Scenario and Timeframe of Interest

To meet the identified exercise goals and objectives and to facilitate the participation of any interested country, INEX 4 has been developed around a single generic scenario based on a contamination footprint arising from a malicious event involving a radiological dispersion device in an urban area. The basic design characteristics for the scenario include:

- A single radiological dispersion device (RDD) as the initiating event;
- A clearly defined contamination footprint with early phase countermeasures that have been taken. Fixed elements include: source term, size of footprint (within a generic cityscape), early actions taken and driving inputs (MSELs). Recommendations on the type and scale of urban impacts have been provided to guide the NEO/NPCs on the footprint placement and orientation.

Additionally, it is assumed that aspects dealing with security and forensics have been completed, and are therefore not explicitly addressed in the common framework. However, as noted previously, this does not preclude countries, if they so desire, from more closely examining these aspects under their own initiative and in a manner consistent with the framework.

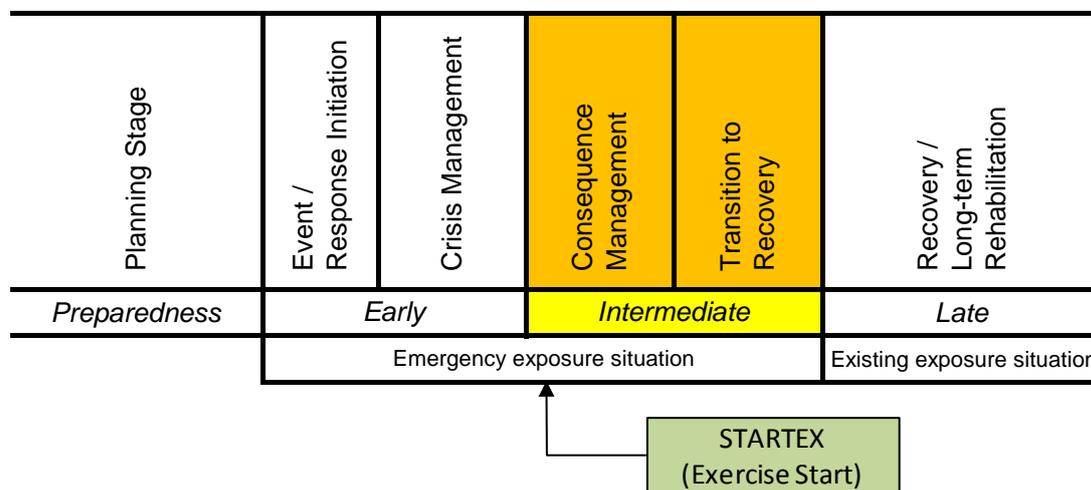
The start of exercise play (STARTEX) within the INEX 4 framework occurs at a time clearly identified as being after the crisis/early phase has ended (see Figure 1). While issues related to the initial crisis management will inevitably be discussed during the exercise, crisis phase play is considered 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 “response” 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.

² Exercise outcomes with respect to stakeholder aspects should be provided as input into the NEA/CRPPH *Workshop on stakeholder involvement in post-emergency management (12-14 Oct 2010)*.

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 period of a few days after the initiating event and the start of the response. Specifically, it is assumed that the following conditions apply:

- The national emergency response arrangements are operational and the crisis phase terminated;
- The release of radioactive materials has ceased;
- The deposition of radioactive materials has occurred;
- The contamination of the environment has been roughly characterised;
- Any urgent (life-saving) countermeasures have been implemented and are no longer under consideration;
- All immediate public health issues have been addressed;
- Other countermeasures implemented during early phase may still be in place (such as evacuation, food bans, agricultural countermeasures, etc.);
- Security and forensics aspects have been completed;
- Further countermeasures will be anticipated as part of the INEX 4 exercise play.

To ensure a structured approach to addressing the exercise objectives and topic areas, the generic scenario includes a Master Scenario Events List of scenario updates, driving inputs and questions addressing each of the identified topical areas. The MSELs have been designed to encourage interaction and discussion between players and help participating countries address all questions on the common evaluation questionnaire included in the generic exercise materials. Their use by the exercise moderators will allow appropriate emphasis to be placed on the various parts of the national arrangements and ensure that all topical areas are adequately addressed. Moderators may supplement these inputs with others as appropriate, bearing in mind the overall focus of INEX 4.

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 4 scenario and MSELs provide a reasonable basis for NEO/NPCs to develop their specific exercise scenario through

placement/location in a chosen urban 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 response, including the development of recovery plans or strategies for a return to normalcy.

In summary, to facilitate national exercise planning and conduct and support overall INEX 4 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 4 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 associated with the intermediate phase of emergency management, INEX 4 has been designed as a series of issues-driven table-top exercises to be conducted individually in each interested 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 discuss and review their plans for consequence management and the transition to recovery in response to the specific scenario and MSELs. Discussions will typically focus on response roles 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 4 international evaluation workshop.

It is the view of the INEX 4 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 4 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 4 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 4 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 five 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 response 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 4 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 the response, decisions, actions, national and international notifications/communications that have been carried out in the “early crisis phase” prior to start of play, 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 4 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 to deal 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 response 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 addressing the urban environment (human health, critical infrastructure, environment, economics, etc), the termination of countermeasures, information to be exchanged internationally, decisions and actions with international implications, issues relevant to long-term recovery and other topics within the exercise scope. 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 Lead 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 artificialities introduced through this process will be managed by the use of appropriate briefing materials and inputs.

Consistent with the identified topic areas, the Players should conclude the exercise by developing a “recovery strategy” outlining the planning arrangements for recovery and the return to normal conditions. The recovery strategy should identify the long-term issues to be addressed (e.g., clean-up, waste management, restoration of services, normalisation of relations with other countries, public information and interaction, etc), types of resources required, limitations on the use of resources or gaps in capabilities, and identification of lead and supporting authorities for the recovery actions.

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 4, 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 part way through the “response”, 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, exercise 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 4, any required external communications will be defined by national objectives. Unless specifically included by the NEO/NPC in the exercise design, Exercise Players may assume that external national and international communications will be simulated.

2.4 INEX 4 Participants and Training

The key constituencies for INEX 4 participation include decision-makers, emergency managers, policy staff and technical decision-makers from national organisations and agencies involved or implicated in consequence management and recovery. 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 4 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 4 Technical Materials as a basis for training on aspects specific to INEX 4. NEO/NPCs are responsible for any pre-exercise training or information sessions for players on specific national consequence management arrangements.

2.5 INEX 4 Evaluation: National and International

INEX 4 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 4 exercise is to test or investigate national response arrangements or approaches, 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 4 exercises be documented and shared to the extent possible. As with other INEX exercises, the INEX 4 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 4 Exercise Evaluation Questionnaire* has been developed based on the INEX 4 topical areas, 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 6 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 4 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 4 International Evaluation Workshop, which is being organised by NEA for 2011 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 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 4 exercise, in addition to other interested countries and international organisations, will be invited to participate in the workshop.

3. INEX 4 NATIONAL PLANNING REQUIREMENTS

Each country participating in INEX 4 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 4 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 4 scenario will need to be developed for exercise play. The scenario should clearly and coherently lead into the intermediate phase 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 role;
- 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 4 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 4 development process. As chair of the National Planning Committee, the NEO should have a good understanding of the arrangements to be tested/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 4 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 4 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 4 is an issues-driven discussion-based exercise, Moderators have an key role in ensuring that the exercise remains focussed 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, 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 each topical area, 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 spend excessive time in debate or developing 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 4 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 4 Exercise Evaluation Questionnaire and any other national reporting. In order to undertake this effectively, evaluators/recorders should have an complete understanding of the INEX 4 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 4 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 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 of the participating country, as well as other invited relevant stakeholders. Given the nature of the INEX 4 exercises, 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 4: Guide for Players*.

3.2 National Level Exercise Materials

As part of the national planning for INEX 4, 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 4 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 exercise 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 4 General Information document, NEA recommends that all INEX 4 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 4 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:

Documents	Distribution	Colour code
General Information	Not restricted	n/a
Guide for National Planning Committees, including MSEs, briefing materials, driving inputs Exercise Evaluation Questionnaire	National planning team (organisers, moderators, evaluators/recorders)	Colour 1
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 Lead 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 4 exercise;
- Review of the national emergency management organisation, with a focus on arrangements for consequence management and transition to recovery relevant to the INEX 4 scenario;
- Review of the type of consequence management topics 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;
- Managing an exercise beginning in the intermediate phase;
- 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 prepare themselves 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 4 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 the other participants. A suggested agenda for such a briefing is as follows:

- Background, purpose and objectives of the INEX 4 exercise;
- Review of the national emergency management organisation with a focus on arrangements for consequence management and transition to recovery for a malicious event in an urban area;
- Review of the type of consequence management topics 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 4 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 2010-March 2011. 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 6 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
Jan-Mar 2010	Approval and distribution of the INEX 4 Technical Materials
	<i>Exercise preparation (see following table)</i>
Sep 2010-Mar 2011	Official time window for INEX 4 conduct (choice of each country within this period for date of its national exercise)
<i>6 weeks following exercise completion</i>	Completed INEX 4 Exercise Evaluation Questionnaire sent to NEA (to be sent no later than May 2011)
Dec 2011	INEX 4 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 4 exercise conduct
Suggested Period After Exercise Conduct	Activity
<1 month	National de-brief meeting
1 month	Completion of INEX 4 exercise evaluation questionnaire
Dec 2011	Attendance at INEX 4 international evaluation workshop

4. REFERENCES

- NEA (2007a), *Experience from the INEX 3 Consequence Management Exercise*, OECD (Paris)
- NEA (2007b), *Strategy for Developing and Conducting Nuclear Emergency Exercises*, OECD (Paris)
- INEX 4: General Information, NEA/CRPPH/INEX(2009)6
- INEX 4: Guide for National Planning Committees, NEA/CRPPH/INEX(2009)7
- INEX 4: Guide for Exercise Players, NEA/CRPPH/INEX(2009)8
- INEX 4: Exercise Evaluation Questionnaire, NEA/CRPPH/INEX(2009)9

5. GLOSSARY OF TERMS

National Exercise Organiser	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.
National Planning Committee	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.
Exercise Planning Representative	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 4 exercise.
Exercise Player	A participant in the exercise that is required to respond to the exercise scenario in accordance with their emergency response arrangements, procedures and training.
Exercise Moderator	The individual or individuals with responsibility for maintaining the efficient conduct of a national INEX 4 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.
Exercise Evaluator/Recorder	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 4 Exercise Evaluation Questionnaire and any other exercise reporting.

ANNEX 1

INEX 4 GENERIC SCENARIO

1. Overview of the Generic INEX 4 Scenario

Taking into consideration the identified exercise goals and objectives and to facilitate the participation of any interested country, INEX 4 has been developed around a single generic scenario based on a contamination footprint arising from the malicious use of a radiological dispersion device in an urban area. The basic design characteristics for the scenario include:

- A single radiological dispersion device (RDD) as the initiating event;
- A clearly defined contamination footprint with early phase countermeasures that have been taken. Fixed elements include: source term, size of footprint (within a generic cityscape), early actions taken, and driving inputs (MSELs). Recommendations on the type and scale of urban impacts have been provided to guide the NEO/NPCs on the footprint placement and orientation;
- It is assumed that aspects dealing with security and forensics have been completed, and are therefore not explicitly addressed in the common framework³.

The INEX 4 generic scenario has been designed around these characteristics and includes:

- An credible outline 'narrative' describing the initiating incident, generic meteorology and incident impact, the response undertaken in the crisis phase and the status of the situation at a suitable point after the crisis phase has terminated (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 4 objectives and evaluation topics, as well as any additional focus areas identified by the country.

³ This does not preclude countries, if they so desire, from more closely examining these aspects under their own initiative and in a manner consistent with the framework.

Information contained in this scenario may be altered to meet national need, with the exception of the section on “*Ground Truth / Defined Information*”, 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 4 exercise scenario are reflected in the national INEX 4 Guide for Exercise Players.

Scenario Mechanism - Scope and Limitations

NEA has recognised that the current political climate in many countries has focussed much interest on source dispersion mechanisms arising from malicious activities. While the INEX 4 scenario explicitly uses such activities as the initiating event, it is noted that the exercise focuses on the consequence management arrangements to deal with the impacts of the emergency. INEX 4 therefore should not be classified as a “counter-terrorism” exercise. To this end, the INEX 4 framework has attempted to provide a means of investigating the consequence management arrangements for such incidents without necessitating the involvement of security services and other such organisations. These aspects are considered beyond the scope of the common INEX 4 framework as elaborated in this document. The proposed scenario, however, does not preclude or prohibit the inclusion of security aspects or the involvement of security services in a country’s exercise. The addition of security aspects to the INEX 4 exercise scenario and MSELs is at the discretion of the NEO/NPC (for example, they may be considered as precursors to the consequence assessment and management). However, their inclusion should be consistent with the common INEX 4 framework, and not negatively impact investigation of the common objectives and topic areas. Additionally, any outcomes related to these aspects will not be considered as part of the formal reporting/assessment of the INEX 4 exercise programme.

ANNEX 2

DETAILED INEX 4 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.

Information contained in this scenario may be altered to meet national need, with the exception of the section on “*Ground Truth / Defined Information*”, to ensure that consistent scenarios are used in all countries.

The National Planning Team should ensure that any modifications made to this generic scenario in order to define the specific national INEX 4 exercise scenario are reflected in the national INEX 4 Guide for Exercise Players (see NEA/CRPPH/INEX(2009)8).

Scenario Narrative

Back Story

Note: Discussions about security / law enforcement are NOT part of the common INEX 4 exercise objectives; however, the following back story is presented below in order to provide additional context should a country wish to expand the scope of their play. This information will not be included in the INEX 4 Exercise Evaluation Questionnaire.

Two weeks before the attack, a medical irradiation facility reports a burglary at their facility to the appropriate officials. During non-business hours, an individual or group of individuals broke into the facility and stole three (3) relatively small irradiation sources totalling approximately 3.5 Terabecquerels (TBq). Other, larger irradiation sources were left untouched. There is no physical evidence at the scene that leads to any suspects, however, the nature of the burglary does indicate that the facility was specifically targeted and the thieves knew what they were stealing. Local officials contact the national officials to report the theft of the hazardous material. National officials launch an investigation but are unable to identify any suspects. There is no other intelligence or information that leads officials to believe there is either a radiological threat or an imminent threat of a terrorist attack.

Immediate Response

A large explosion is heard in the downtown area of a city during the morning rush hour. The emergency reporting system is quickly overwhelmed with callers reporting injuries in the area and significant localized damage. First responders (fire, police, and emergency medical services) secure the area and begin to treat the wounded. Initial reports are that a vehicle-borne improved explosive device (VBIED) detonated in the middle of a busy intersection. A number of individuals are injured in the area with many more having left the area. One dead body is found in the remains of the driver’s seat of the VBIED. First responder personnel with radiation pagers notice that their pagers are detecting the presence of radiation and request the local Hazardous Materials (HazMat) Team to respond. HazMat personnel

respond and identify the isotope as Cesium-137. Based on this information and the scope of the incident, local first responders request assistance from nearby communities and national radiation experts.

Initial Response

Emergency Centres are activated at all levels of government. Responding agencies' Public Affairs representatives form a Joint Public Information Centre (JP IC). The local hospitals in the area receive a large influx of patients who claim to have been in the area when the explosion occurred. Command is established at the scene to include local law enforcement, the local incident management team, national law enforcement and the radiological competent authority.

Command establishes the following initial priorities for the response:

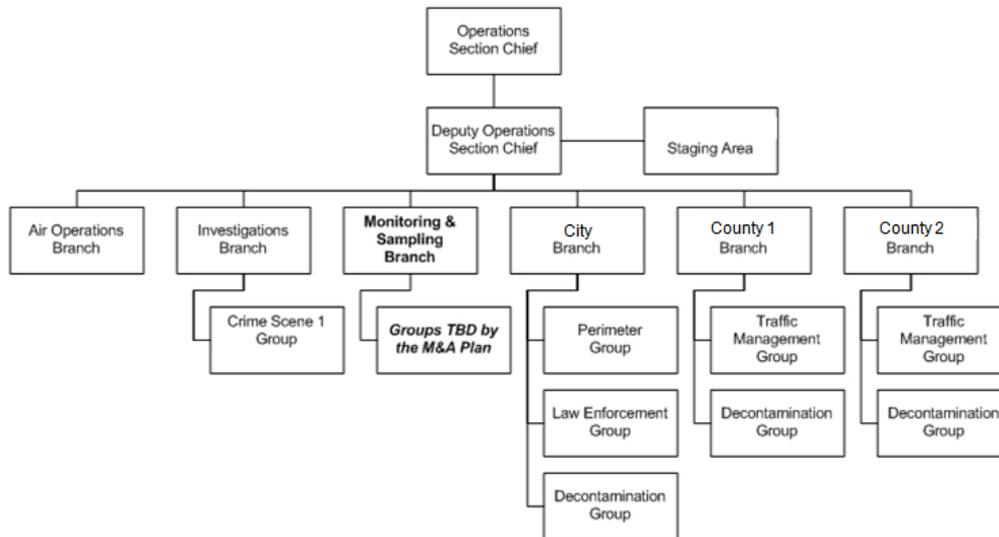
- Safety and welfare of responders and public;
- Validate extent of radiological contamination;
- Crime scene and evidence preservation;
- Restoration of government;
- Restore critical infrastructure;
- Minimise further impact of the environment;
- Minimise economic impact of the region;
- Maintain public confidence;
- Maintain communications with other countries, appropriate international organisations;
- *National Planning Teams may add additional priorities.*

Based on those priorities, the following incident response objectives are developed:

- Continue to provide for the safety and welfare of the responders and public;
- Continue monitoring and sampling activities to valid the extent of contamination and determine appropriate actions;
- Continue to monitor and treat the population for radiological health effects;
- Continue to provide shelter for the evacuated population;
- Continue evidence collection and investigation;
- Maintain a secure perimeter around the crime scene and evacuated area;
- Maintain civil order in and around the affected area;
- Maintain quarantine and embargo of potentially contaminated consumer products and identify criteria for exceptions;
- Evaluate and assess the impact on wildlife and domestic animals and recommend appropriate actions;
- Ensure proper decontamination for the responders and properly dispose of contaminated material;
- Establish and maintain effective traffic control measures around the impact area;
- Evaluate and develop criteria for re-entry to contaminated areas;
- Assess the impact to, and plan to restore, critical infrastructure;
- Assess the impact to, and plan to restore, the local economy;
- Continue an aggressive media and outreach program in coordination with the JPIC;
- Maintain an aggressive outreach to affected entities and stakeholders;
- Communication and coordination with international community;
- *National Planning Teams may add additional objectives.*

To organise the response, the Operations Section Chief creates the following structure (*Note: This is a sample organisation. National Planning Teams may alter this to fit their system*):

Operations Organisation



The Monitoring & Sampling Branch, responsible for identifying the extent of environmental radiological contamination, identifies the following critical infrastructure for priority monitoring:

- Hospitals in and around the evacuated/shelter in place area;
- Fire Department Headquarters;
- Fire Station (Local station);
- Police Department Headquarters;
- Police Station (Local Precinct);
- City Public Works Department;
- Public Health Department;
- Railroad at random locations;
- Nearby Expressway/Highway at random locations;
- Bus Terminal;
- City Offices;
- Social Services Offices;
- *National Planning Teams may add additional locations for priority monitoring.*

Follow-on Response

Days after the detonation, the mandatory evacuation area includes a number of people, businesses and government offices. Shelters have been set up to house evacuees. The main shelter, in the affected city, is at capacity and sheltering a number of people, while another shelter in a neighbouring city is sheltering a smaller number of people and has additional capacity. Each shelter has a Community Reception Centre (CRC), operated by the Ministry of Health, to medically screen potentially injured people.

A large number of people were at work in the downtown area at the time of the detonation. Those people have been evacuated and cannot return to their offices. Heating, Ventilation, and Air Conditioning (HVAC) Systems in these buildings have potentially let in contamination and particulate debris.

The main City Water Pump Station, drawing its water from the river in the contaminated area, shut down within 2 hours of the detonation but the level of contamination is unknown.

A number of hotels in the mandatory evacuation area have been shut down. All of the guests and employees have been relocated to nearby hotels, straining the local hotel availability.

Much of the critical infrastructure in the area is closed pending determination of the level of contamination and evaluation of the impacts to the building facilities.

Ground Truth Information

Defined Information

The following information is standard for all INEX 4 exercises, and should not be modified.

a) WEATHER

Weather information at the time of the detonation	
Description	Amount
Wind Speed	10 km/h
Temperature	24 C
Visibility	Partly cloudy; no precipitation

b) RADIOLOGICAL DISPERSAL DEVICE INFORMATION

The RDD is constructed in a vehicle-borne improvised explosive device (VBIED). The adversary used a common sport utility vehicle (SUV).

Those planners wishing to increase the extent of the scenario should do so through the use of multiple RDDs. The source term and explosive should not be modified.

Source Term Information	
Description	Amount
Source Term	3.7 Terabecquerels
Isotope	Cesium-137
Explosive	11 kg (25 lbs) of high explosive (such as C-4)

Variable Information

The following information may be modified by the National Planning Team based on the selected location and local information. A consistent set of numbers are provided in the right-hand column as guidance and some variables have minimum and/or maximum parameters to ensure reasonably consistent scenarios across all participating countries.

The most important decision the National Planning Team will make is the location of the detonation. The location should be selected based on a number of significant parameters to match the objectives for each participating country, including:

- Population;
- Location within the country (proximity to a border, other cities, etc.);
- Critical Infrastructure, such as:
 - Ports;

- Highways / Transit Corridors;
- Regional or National Government facilities;
- Landmarks or National Monuments;
- Amount of Tourism.

Variable Local Information		
Description	Chosen Value	Parameters / Guidance
Location of the detonation		<i>see parameters (above) and Technical Products (below)</i>
Season and general weather conditions for the follow-on response and transition to recovery		<i>Summer with temperate climate conditions; no major storms</i>
Number of individuals injured in the initial explosion		<i>Between 25-300</i>
Number of individuals in the downtown area at the time of the explosion		<i>Location dependent. Approximately 15,000 for a medium-sized city.</i>
Number of hospitals in the area		<i>Location dependent. Approximately 2 for a medium-sized city.</i>
Number of individuals reporting to each hospital in the area		<i>Location dependent. Approximately 100 for a medium-sized city.</i>
Number of people in the evacuation zone at the beginning of the “follow-on response”		<i>Location dependent. Approximately 1,200 for a medium-sized city.</i>
Number of businesses in the evacuation zone at the beginning of the “follow-on response”		<i>Location dependent. Approximately 350 for a medium-sized city.</i>
Number and location of shelters set up at the beginning of the “follow-on response”		<i>Location dependent. Approximately 2 for a medium-sized city.</i>
Number of people each shelter is housing		
Number of hotels closed		<i>Location dependent. Approximately 4 for a medium-sized city.</i>
Number of guests relocated		<i>Location dependent. Approximately 650 for a medium-sized city.</i>

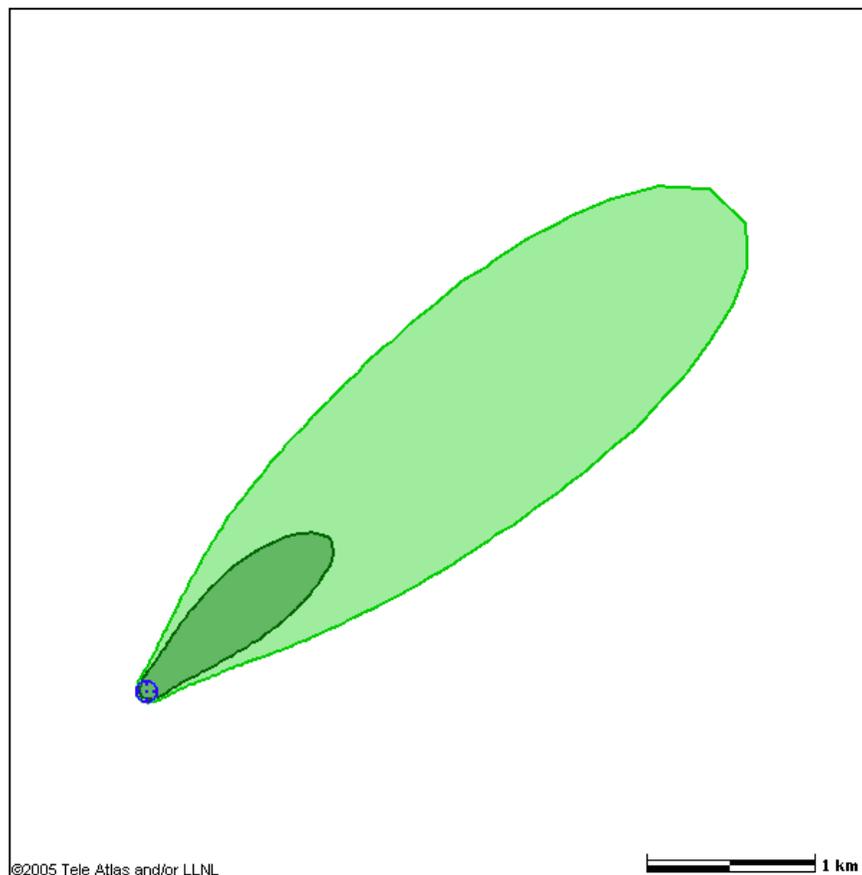
Technical Products

The following pages contain sample plume model outputs outlining the consequences of the dispersal of the Cs-137. The blue circle represents the detonation point. National Planning Teams may cross-reference these maps when determining the location of the detonation for their scenario. The models do not include a map overlay since countries will be locating the detonation in one of their cities. If countries wish to use their own modelling systems to produce documents with a map overlay they should be careful not to change the Ground Truth information, including weather information and hazard information, to ensure their product matches the Ground Truth level of contamination.



Sample INEX-4 Plots

Radiological Release Dose Including Plume Passage
(Total Effective Dose 0-96Hrs)



©2005 Tele Atlas and/or LLNL

Map Size: 5.1 km by 5.1 km

Effects and Actions			
	Description	(mSv) Extent Area	Population
		>0.10 1.4 km 0.5 km ²	
		>0.01 4.5 km 4.4 km ²	
Areas and counts in the table are cumulative.			

Effects or contamination from--- to --- at or near ground level.

Release Location: --- N, --- W

Material: CS-137

Generated On: September 25, 2009 14:49 UTC

Model: ADAPT/LODI

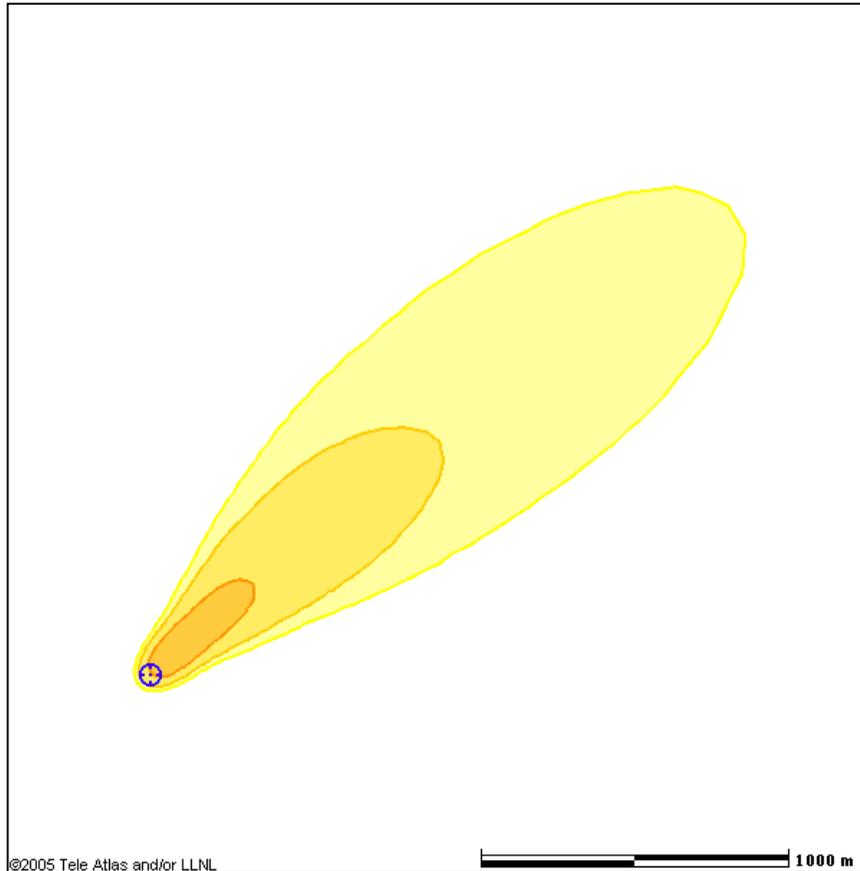
Comments: Hypothetical release

05/31/2009 14:00:00 UTC for 2 min

Canned meteorology



**Emergency Workers Dose Rate (Far Field)
(Groundshine Dose Rate at Release Time + 12 Hrs)**



Map Size: 2.8 km by 2.8 km

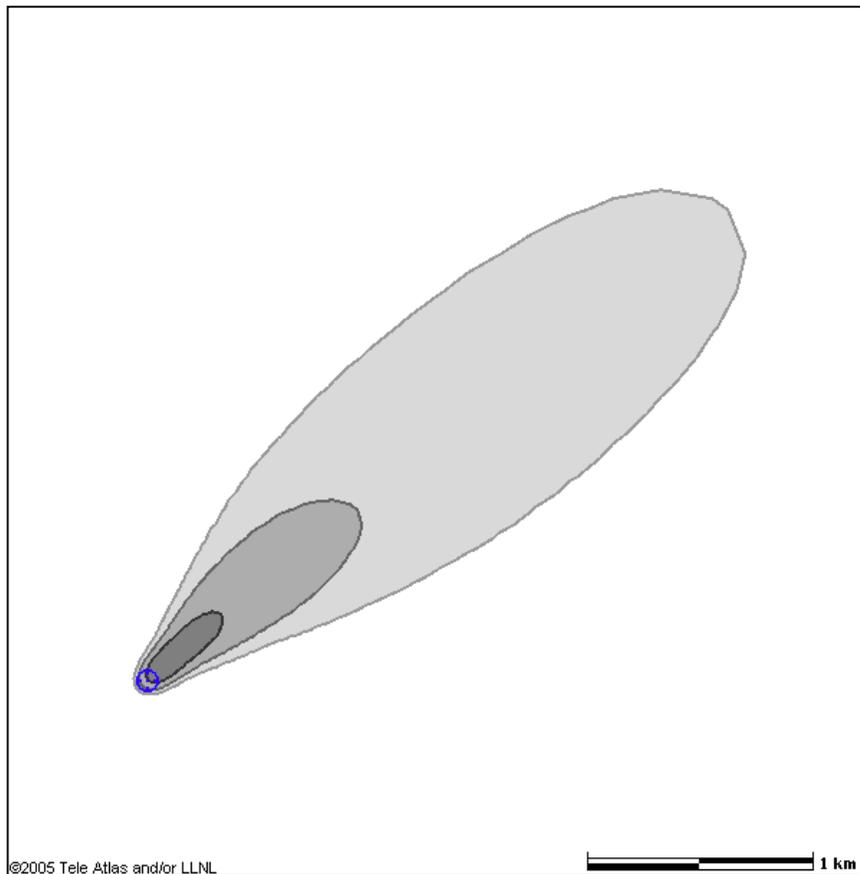
Acute (Short-Term) Effects			
	Description	(mSv/hr) Extent Area	Population
		>1 0.4 km 0.05 km ²	
		>0.10 1.2 km 0.3 km ²	
		>0.02 2.4 km 1.4 km ²	
Areas and counts in the table are cumulative.			

Effects or contamination at --- at or near ground level.
Release Location: --- N, --- W
Material: CS-137
Generated On: September 25, 2009 14:49 UTC
Model: ADAPT/LODI
Comments: Release starting at 05/31/2009 14:00:00 UTC for 2 min
 Canned meteorology at 05/31/2009 14:00:00 UTC
 Groundshine dose only. Assumes use of respiratory protection.



Sample INEX-4 Plots

Radiological Release Deposition at 12hrs
(Surface Contamination from Deposited Radionuclides)



©2005 Tele Atlas and/or LLNL

Map Size: 3.8 km by 3.8 km

Effects and Actions			
	Description	(MBq/m2) Extent Area	Population
		>10 0.4 km 0.05 km ²	
		>1 1.2 km 0.3 km ²	
		>0.10 3.3 km 2.5 km ²	
Areas and counts in the table are cumulative.			

Effects or contamination at --- at or near ground level.

Release Location: --- N, --- W

Material: CS-137

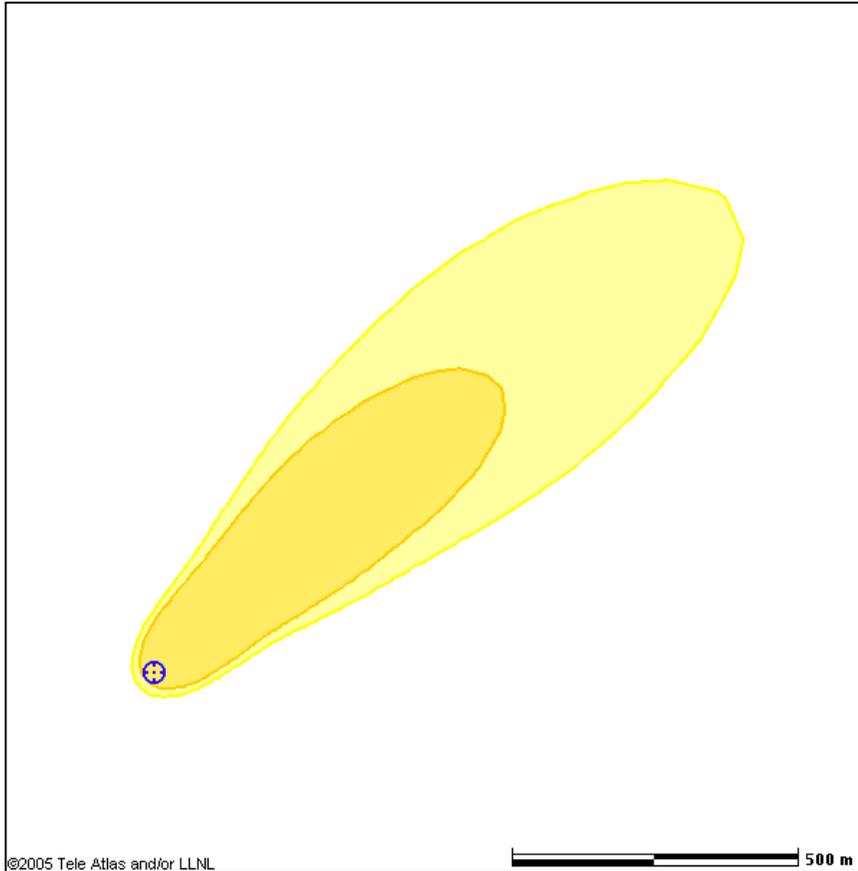
Generated On: September 25, 2009 14:49 UTC

Model: ADAPT/LODI

Comments: Hypothetical release
05/31/2009 14:00:00 UTC for 2 min
Canned meteorology



**Radiological Release Intermediate Phase PAGs
(Relocation based on Avoidable Groundshine and Resuspension Dose)**



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Map Size: 1.5 km by 1.5 km

Actions and Long-Term Effects			
	Description	(mSv) Extent Area	Population
		>20 783 m 145 683 m ²	
		>5 1 296 m 409 771 m ²	
Areas and counts in the table are cumulative.			

Effects or contamination from--- to ---at or near ground level.

Release Location: --- N, --- W

Material: CS-137

Generated On: September 25, 2009 14:49 UTC

Model: ADAPT/LODI

Comments: Doses shown are accrued after 06/01/2009 02:00:00 UTC and can be avoided by protective actions

Hypothetical release

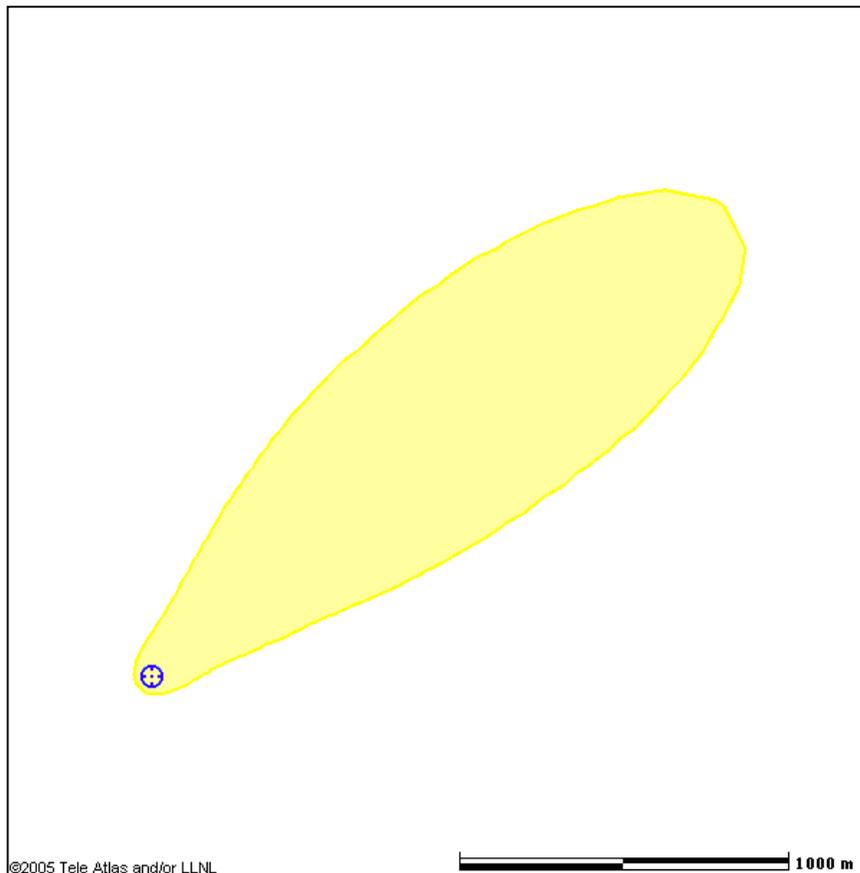
05/31/2009 14:00:00 UTC for 2 min

Canned meteorology



Sample INEX-4 Plots

**Radiological Release Intermediate Phase Dose
(Based on Avoidable Groundshine and Resuspension Dose 12hr-50yr)**



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Map Size: 2.6 km by 2.6 km

Actions and Long-Term Effects			
	Description	(mSV) Extent Area	Population
		>50 2.2 km 1.2 km ²	
Areas and counts in the table are cumulative.			

Effects or contamination from--- to --- at or near ground level.

Release Location: --- N, --- W

Material: CS-137

Generated On: September 25, 2009 14:49 UTC

Model: ADAPT/LODI

Comments: Doses shown are accrued after 06/01/2009 02:00:00 UTC and can be avoided by protective actions

Hypothetical release

05/31/2009 14:00:00 UTC for 2 min

Canned meteorology

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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. To facilitate discussions during the exercise and completion of the post-exercise questionnaire, the MSEL has been organised according to the INEX 4 topic areas:

1. Decision-making on protection strategies for consequence management and the transition to recovery, including issues in:
 - optimisation (including technical, economic and social factors);
 - implementation and termination of countermeasures ;
 - communication and coordination between countries and international organisations:
 - communication arrangements (capability, willingness and practical ability to exchange information);
 - understanding of the emergency situation;
 - recommendations for protective actions;
 - communication of recommendations for protective actions;
2. Public health, including issues in information and communication;
3. Monitoring and assessment, including capability assessment;
4. Safety and security of populations and infrastructure, including
 - population control (police command and control);
 - population management;
5. Planning for recovery, including:
 - clean-up and waste management;
 - stakeholder involvement.

Each topic begins with an overview of its associated general issues and related areas of investigation. This is then followed by a specific scenario update and associated questions that are intended, through the use of concrete examples, to initiate and focus discussion amongst players to help them address the broad issues associated with the topic area.

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 4 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.

1) DECISION MAKING

Topic Overview: This topic addresses the decision making processes that are followed in responding to the exercise scenario. The focus is on decision-making for protection strategies addressing consequence management and the transition to recovery, in particular with respect to approaches to countermeasures (optimisation, implementation and termination) and international communications. Relevant issues include how decisions may be made, what and how various factors may be taken into consideration during optimisation (e.g., technical, economic, social and international considerations; changing priorities) and how this is communicated to various stakeholders, implementing and terminating protection strategies, and the role of and approaches to international communications (capability and practical ability to exchange information; understanding the situation; communicating decisions).

Scenario Update: Local business representatives ask whether or not their goods are marketable and sellable. The superintendent of the school system calls to inquire as to the status of shelters that have been set up at local schools. By law, schools must be in session a minimum number of days per year and there is concern that the shelters will interfere with activities once classes resume. Some on-scene commanders request guidance on reducing the size of the evacuation zone. Some evacuated citizens request to move to hotels; others want to travel to family members. A railroad representative inquires as to when rail service through the affected city can resume. Freight service to many cities has been affected by the emergency rail closure. Department and Agency representatives ask who will be responsible for maintaining incident response documentation. Many responders seek out critical incident stress debriefing from the supervisors.

Discussion Questions for Higher Level Participation:

- Who is the national lead organisation for responding to this situation? Was it pre-planned or determined ad-hoc? Is the lead organisation different from what it would have been for a nuclear and/or radiological accident?
- Several countries have offered their assistance in general terms. Is this something you would consider accepting? If so, are plans in place for accepting such assistance or would this be dealt with ad-hoc? Who decides?
- Which intermediate and longer term aspects/consequences (e.g. annual school days, traffic/trade issues, public health follow up) need to be dealt with at this stage and at which level?
- How would response priorities (e.g. monitoring resources) be established?
- What decision-making processes exist as part of the emergency arrangements? Will evaluations of decisions taken occur afterwards and what are the consequences of inadequate decisions?

Discussion Questions: Optimisation

- What factors (technical, economic, social) will be considered in the decision-making and how will these be accounted for? Is there an overarching optimisation process or are decisions optimised individually? How will stakeholder input be managed?
- What thresholds or criteria will be used to determine if local consumer products can still be sold? Who approves such a threshold? Who collects and verifies the readings?
- What impact would there be of closing the railroad through the city? Can traffic be re-routed?
- Will critical incident stress debriefing be made available? What form will it be in? Will it be voluntary or mandatory? Who will track the usage?

- Who will be responsible for compiling the final package of incident response documentation? What documentation needs to be archived?

Discussion Questions: Termination of Countermeasures

- Are plans in place with specific criteria established for terminating already implemented actions (evacuation, sheltering and others)? If so, what are these criteria and what is their legal status?
- Can the shelters be re-located? Can classes be conducted at alternate locations or through distributed learning methods?
- Who has the authority to reduce the size of the evacuation and shelter-in-place zone? What criteria will be used? How will it be communicated? Is it better to do reduce it incrementally or in large blocks?
- Can evacuated citizens choose to stay in hotels or travel to relatives/friends respectively? Can they claim reimbursement of hotel/travel costs?

2) PUBLIC HEALTH

Topic Overview: This topic addresses the approaches to and issues in managing longer-term public health issues arising from the exercise scenario. Relevant issues include mechanisms for and approaches to the tracking and identification of possibly affected individuals (including emergency responders, local populations, individuals who were passing through the area at the time of the event, etc), how to deal with the “worried-well” and concerned individuals outside identified affected areas, appropriate information and communications, etc.

Scenario Update: Hospitals and shelters request guidance on whether the long-term health of the injured and contaminated will be tracked. Individuals with family members who live or work in the contaminated area continue to arrive at the law enforcement perimeter and inquire as to the status of their relatives. Some wish to enter the area to see if their relatives are at home. Occupational Health experts identify the need for long-term medical monitoring of responders due to their exposure to hazardous materials. The city attorney requests a list of all responders who suffered injuries and/or damages during the incident to track liability issues.

Discussion Questions for Higher Level Participation:

- Is there a national response plan or guidance covering health issues? Is long-term follow-up of affected individuals included?
- Who will take care of this follow up and how will it be done?

Discussion Questions: Information and Communications

- Is there sufficient expertise and capacity to treat injured and potentially injured citizens?
- How will the health of affected members of the public be tracked? What information needs to be collected from these individuals to assist in the tracking?
- What kind of information will be made available to the general public/the affected public/family members and how will this be done? What systems are available to inform the public as to the status of displaced persons?
- Who is responsible for tracking responder injuries/damages? How will their long-term health be tracked?
- How will unaffected but worried individuals, or people outside of affected areas with concerns for family members, etc, in the affected area be managed?
- Can citizens be obliged to undergo long-term surveillance of their health to see if damage manifests itself at a later stage? How are medical expenses, treatments, hospitalisation of victims financially covered? What is the role of health insurances?

3) MONITORING AND ASSESSMENT

Topic Overview: This topic addresses approaches to monitoring and assessment to support consequence management and the transition to recovery. Relevant issues include how monitoring and assessment is used to support decision-making, how to coordinate exchange of relevant data and information at the national and international levels, the impact of changing priorities on monitoring and assessment needs and how it can be maintained over an extended response.

Scenario Update: Initial response/monitoring teams have now worked multiple 18-20 hour shifts in order to provide data requested by assessment teams. Occupational health experts request that a plan be implemented to relieve these personnel for multiple shifts to allow them to rest. A representative of the local rental car company calls and states that he has seen video footage on the news of his vehicles operating in the contaminated area and in off-road situations, which are expressly prohibited by the contract. He states that the vehicles cannot be returned and wants to be paid for them before he rents any more cars to responders.

Discussion Questions for Higher Level Participation:

- How will ongoing monitoring and assessment supporting the move to recovery be maintained?
- How will limited resources be managed and prioritised (eg, wide areas vs. most contaminated areas, environment vs. health, important trade issues)?

Discussion Questions: Capability Assessment & Gap Analysis

- How is the radiological contamination characterised? What products are produced to explain this? Is the radiological emergency stable at this point?
- How will the potential spread of contamination out of the area be managed, and how would this be communicated at the international level?
- How long can the initial response/monitoring teams work safely? How long do they need to rest? Can they be integrated back into the response later?
- Can the rental cars be purchased by the government? Will each ministry purchase the cars they used or will one ministry purchase all the cars used in the response? Can the rental car company be forced to provide cars to responders before payment is made?

4) SAFETY AND SECURITY OF POPULATIONS AND INFRASTRUCTURE

Topic Overview: This topic addresses approaches to maintaining the safety and security of populations and property, and the withdrawal of restrictions on movement, access, etc. Issues include the types of reasons and relevant criteria or considerations for withdrawing restrictions, approaches to maintaining critical services affecting public safety/security, how the security of property will be managed, how individuals displaced or impacted by countermeasures will be managed, etc.

Scenario Update: A representative from the judicial system requests access to the courthouse in order to access critical court documents, including documents related to the prosecution of a high profile criminal that must be filed by an approaching legal deadline. Local government officials request information on when their facilities in the contaminated area will be allowed to open in order to provide essential but non-emergency services to the citizens. Law enforcement officers at the security perimeter are approached by citizens with varying reasons as to why they need access to their homes (retrieve pets, family heirlooms, money, medication, etc.). Parking garages near, but not in, the evacuation area are full of vehicles that management is convinced have been abandoned by their owners for fear of contamination. The garage owners want assistance clearing the vehicles. A pawn shop owner calls and reports that someone is trying to sell him goods that he believes have been stolen from the evacuation area. He wants to know what to do with the goods and whether they are contaminated?

Discussion Questions for Higher Level Participation:

- Information regarding the event is requested from foreign embassies in your country? What information are you willing to share? Who decides?
- What information is given to the public? What is not? Is the information to the public provided at the local, regional or national level? Who decides, prepares and coordinates this?

Discussion Questions: Population Control (Police Command & Control) and Management

- Can these individuals have access to the courthouse? If so, what procedures will need to be followed? Are regulations in place to help decision-makers determine who will be allowed into the contaminated area? If not, can the laws/regulations be amended in an emergency to allow for such delays and missed deadlines? Is it useful to set general criteria or is it better to decide on a case-by-case basis?
- Can local government services be run from alternate locations? Can temporary access to the evacuation zone be granted to retrieve critical items?
- What will be done with the vehicles in the parking garages? Who must take charge of them? Who must clear them? How are the costs handled in the long-term?
- Who will investigate the pawn shop owner's claims? How will the origin of the goods be determined? What will be done with them?
- Are any citizens allowed into the evacuation / restricted access area? If so, under what circumstances? Who has the authority to grant exceptions?
- What residual dose rates would be considered acceptable for return of evacuees?

5) PLANNING FOR RECOVERY

Topic Overview: This topic addresses approaches to moving from consequence management towards the transition to post-emergency recovery. Issues include what long-term priorities will need to be managed, which organisations may be implicated, approaches to decontamination and waste management, impact of public reaction, how the increasing role of stakeholders in the decision-framing process will be handled, identifying affected businesses/sectors/etc, dealing with economic impacts, moving towards long-term recovery, types of criteria or considerations for terminating the emergency situation, etc.

Scenario Update: Many businesses and government offices near, but not in, the contaminated area report high rates of absenteeism. A fire chief calls and states that the decontamination team has been collecting runoff water in accordance with their standard operating procedures, but they are running out of storage tanks and want to know how the runoff water will be disposed. The local government employees' labour union issues a statement advising its members to not report back to work in the contaminated area until the government has issued convincing evidence that the facilities are safe. Restaurants in the evacuation area are concerned about the long-term impact of rotting and decomposing food in their buildings and the impact it will have when they are allowed to reopen. The decontamination supervisor reports that many public decontamination stations are ready to be shut down but have contaminated equipment. Rats and insects are creating a public health hazard in the evacuation zone due to excessive garbage in the area that has not been collected.

Many citizens from the contaminated area state that they don't want their vehicles which were left there and they don't want to live in their homes anymore. They want the government to buy the property. Many local businesses that were initially helpful are now demanding payment or return of their equipment. A contractor that provided lighting equipment free of charge is now stating that the equipment is needed for another event and he needs it back immediately. Museum curators express concern over the security of their collections, including priceless fine art and historical artefacts in the contaminated area and the long-term status of their collections. The curators state that they must keep the collection even if it is contaminated. Community leaders express their desire to be included in the public information campaign to assist in delivering the right message.

Discussion Questions: Decontamination and Waste Management

- Are plans or arrangements in place on how to conduct decontamination of public buildings, streets, parks etc? Are these actions being considered? Who decides? Where does the waste go?
- Are plans or arrangements in place on how to conduct decontamination of private buildings, houses, yards, gardens etc? Who decides? Is this mandatory? Who does the work? Who pays? Who is responsible for the waste generated? Where does the waste go?
- Are plans or arrangements in place for handling larger quantities of radioactive waste from decontamination actions?
- What are the criteria used for waste categorisation? What goes where? What is the legal basis for the criteria? Can they be changed in the existing situation?
- Are there plans for collecting runoff water? Who will collect the runoff water and how will it be disposed?
- What will be done with the equipment from the decontamination stations?

- Will the garbage need to be cleaned up before people are allowed back in the area? What will be done with it?

Discussion Questions: Stakeholder Involvement and Recovery

- Who is responsible for stakeholder involvement? Is it covered by response plans?
- How will stakeholders be involved in the process, and what is the possible scope and limitations of such involvement?
- What stakeholder groups need to be included? What outreach needs to be done?
- What efforts can be undertaken to get people to return to work? How long will absenteeism be a problem? What impacts are there and how will these be addressed?
- Can local government employees be forced to return to work? How will labour negotiations be handled? What can be done to convince individuals of the safety of the buildings?
- Can assistance be provided to the restaurant owners within the contaminated area? When will they be allowed to access their buildings? When will they be allowed to re-open? How are their damages/losses handled? What is the role of property insurances?
- Can assistance be provided to the restaurant owners near, but outside the contaminated area? What efforts can be undertaken to get people to return to work and reassure customers of the safety of the food so they frequent the restaurants again? What impacts are there? Can restaurant owners claim damages for their losses or do those fall under the general business risk?
- Does the equipment need to be returned to providing businesses even if it's still needed for the response? Is there a legal obligation that every citizen who is able must assist after accidents? What are the requirements? Can they claim compensation?
- What response will be given to those citizens that don't wish to move back into their homes?
- How can the museum collections be secured? Who is responsible for them? What if they are contaminated?
- What type of criteria will be used for terminating the emergency situation? What issues have been identified for long-term recovery and which organisations will be responsible for managing these aspects?