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A model national emergency response plan for radiological accidents

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A MODEL NATIONAL EMERGENCY RESPONSE PLAN
FOR RADIOLOGICAL ACCIDENTS

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FOREWORD

The International Atomic Energy Agency, through its Division of Technical Co-operation, has supported several projects for the development of a national response plan for radiological emergencies. As a result of the assistance in support of these projects, the IAEA has developed a model National Emergency Response Plan for Radiological Accidents (RAD PLAN), particularly for those countries which have no nuclear power plants. This plan can be adapted for use by countries interested in developing a national radiological emergency response plan of their own.

In all countries, there are agencies that have the basic authorities, resources and capabilities to respond to natural and man-caused disasters. The RAD PLAN was not designed to change any aspect of that system; it was fashioned to provide assistance to the local, regional and national decision makers who, when faced with a radiological emergency, will ask questions such as: "Is it safe for my emergency workers?"; "Do I need to evacuate the public or take another action to protect the public?"; "What should I tell the public?"; "Is the food safe to eat?"; etc. One or more agencies in any country can answer those questions. Since the traditional emergency responders, i.e. the police, fire services, regional/local authorities, and other organizations, must carry out their roles in protecting the public safety, the primary focus of the RAD PLAN is to provide a mechanism to direct the existing radiological capabilities and resources in a country to furnish the needed advice and assistance to the decision makers.

The RAD PLAN was designed specifically for a country that has no nuclear power reactors, but with medical and industrial activities using radiation and radioactive materials. It should be useful as a guide for officials creating a national response plan for their country. The document can also be used for other countries, including those with nuclear power plants. The principles and ideas contained in the RAD PLAN are universal.

It should also be noted that the scope of the plan does not have to be limited to radiological emergencies. It can be readily adapted to other man-caused disasters. The principles of a well co-ordinated and effective response are the same.

The development of a written plan cannot be effective unless the appropriate preparatory work is performed. An organization with a mandate to organize and co-ordinate the country's radiological response must take the lead in writing this plan and doing the necessary preliminary work. Experience shows that a considerable amount of discussion between response organizations will be needed to determine their precise role and the resources and capabilities needed in an emergency. The large number of organizations identified in this plan (16) as having a potential role to play in a radiological emergency is not unusual. Similar situations are expected in most countries. Other organizations may need to be referenced or, conversely, organizations identified in the RAD PLAN might not have a role to play or do not exist.

Experience indicates that the development of such a plan will be difficult without the co-operation of the organizations which have a major responsibility in a radiological emergency. It is best to involve them early in the plan development so that they feel that they are part of its creation. One way to accomplish this is to form an ad hoc working group to periodically review and discuss the progress of the plan development. This should be a

group of mid-level technical experts who have a good overall understanding of their agencies' policies and procedures. In addition, it has also proven very useful to involve the office of the Prime Minister or President in this effort from the very beginning.

Once such a plan is adopted, it will be up to each individual organization to assure that it can carry out its role effectively and develop the appropriate response organization and implementing procedures. After that, exercising and testing of the plan becomes a vital component. Finally, it must be remembered that periodic reviews of the plan and modifications, based on actual events and exercise experience, must be ongoing.

For the purpose of this model plan, it was assumed that there is more than one organization having technical expertise that would be called upon in a radiological emergency. The responsibility for the following tasks is assumed to be divided among two or more organizations: (1) licensing and inspection of industrial activities using radioactive material; (2) licensing and inspection of medical users of radionuclides; (3) surveillance of other radiation users, e.g. X rays; and (4) monitoring of radiation in the environment. If only one organization in a country has responsibility for all these activities, then the plan can be simpler.

For purposes of illustration only, the model plan presumes that there is a 'National Regulatory Authority' which has responsibility for the licensing and inspection of all activities using radioactive materials and that the 'Ministry of the Environment' would perform most of the radiological monitoring and analysis in an emergency. Other arrangements have been noted in other countries. These can easily be accommodated when modifying the model plan.

Another assumption, based on the IAEA's experience, is that there are three distinct levels of government in a country, i.e. national, regional and local. Each one of these will have decision makers who will need technical advice. This should be carefully considered in the writing of the plan.

Two other concepts are included in this plan which have been found to be quite useful. The first is a 'Radiological Advisory Committee'. Its primary role is to provide co-ordinated government advice from the national government to the decision makers at all levels of government. This committee is described fully in the plan.

The second is a 'Joint Information Co-ordination System'. It has been shown over and over that there is a need to have a system to provide accurate and consistent information to the public and the media at the scene of an accident. Radiological accidents may need such a system even more than other types of emergencies because of the extreme public and media concerns about this type of accident. The various components of such a system are reported in detail in the plan.

Items in italics in the plan are provided as instructions for the user in adapting this plan. More severe changes in the text may be required for particular unique situations which may exist in a particular country.

For ease in writing the plan, the IAEA will provide officials, upon request, with the latest version of the RAD PLAN on a computer diskette, in Word Perfect 5.1 format. Requests for a copy of a diskette containing the plan should be addressed to:

Co-ordinator, Emergency Assistance Services
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1. INTRODUCTION AND BACKGROUND

1.1. PURPOSE

The objective of the National Emergency Response Plan for Radiological Accidents (RAD PLAN) is to establish an organized emergency response capability for timely, co-ordinated action of the [*Country*] authorities in a peacetime radiological incident or emergency. The RAD PLAN describes the capabilities, responsibilities and authorities of government agencies and a concept for integrating the activities of these agencies to protect public health and safety. The RAD PLAN does not alter the authorities or responsibilities ascribed to any agency on a daily basis. However, the RAD PLAN does assign a responsibility to specific agencies for co-ordinating activities of other agencies involved in a response. A government agency may initiate a response activity either under its statutory authority or in response to a request for assistance from another government agency.

For the purpose of this plan, one government agency will be referred to as the Lead Technical Agency (LTA). The RAD PLAN assigns to this agency major co-ordination and technical support functions which begin at the initial notification of a radiological emergency and end when all government agencies have terminated their response activities.

The RAD PLAN:

(1) Provides the government's concept of operations based on specific authorities for responding to radiological emergencies;

(2) Outlines policies and planning assumptions on which the concept of operations of this plan and government agency specific response plans are based;

(3) Specifies authorities and responsibilities of each government agency that may have a role in such emergencies.

There are three sections to the plan. Section 1 contains information of a general nature. Section 2 describes the concept of operations from the perspective of organization, stages of response activity, and international co-ordination. Section 3 contains information about each organization's response mission, capabilities and resources, relevant reference documents and specific authorities.

EACH GOVERNMENT AGENCY SHOULD DEVELOP AND MAINTAIN THEIR OWN UNIQUE AGENCY PLAN AND DETAILED OPERATING PROCEDURES WHICH CARRY OUT THE RESPONSE DESCRIBED IN THIS PLAN. THESE OPERATING PROCEDURES SHOULD BE CONSISTENT WITH THIS PLAN.

1.2. PARTICIPATING ORGANIZATIONS

Each participating organization has responsibilities or capabilities that pertain to various types of radiological emergencies. The following organizations participate in the RAD PLAN.

- Nuclear Regulatory Authority
- Ministry of Health
- Ministry of the Environment

- Meteorological Service
- President/Prime Minister's Office
- Ministry of Foreign Affairs
- Ministry of Information
- Ministry of Defence
- Ministry of Agriculture
- National Police Authority
- Department of Civil Defence
- Fire Services Department
- Ministry of Transport
- Marine Department
- Ministry of Social Affairs
- Red Cross/Red Crescent.

1.3. SCOPE

The RAD PLAN covers any peacetime radiological emergency that has or is expected to have a significant radiological effect within (*Country*) and its territorial waters and that could require a response by several government organizations. Emergencies occurring at fixed nuclear facilities, field activities, or during the transportation of radioactive materials fall within the scope of this plan. Also included within the scope of this plan is an accident occurring outside of (*Country*) but which has an impact on (*Country*).

The level of the government response to a specific emergency will be based on the type or amount of radioactive material involved, the location of the emergency, the potential for impact on the public and the size of the affected area.

1.4. TYPES OF EMERGENCIES

Each type of emergency presents different response problems. Fixed nuclear facilities have the advantages of known locations and, in most cases, existing site specific emergency plans.

Transportation emergencies may occur anywhere and may involve a variety of radioactive materials. In general, these emergencies present less of a radiological hazard or serious threat to the public. In most cases, local resources may suffice, but a limited national response may be called upon in support of that effort.

This plan applies to the following types of radiological emergencies. The concept of operations for the government response described in this plan also may be adapted to any other unanticipated type of emergency which may occur.

1.4.1. Nuclear or radioactive materials activities

An emergency of this type is one which occurs at a facility or activity licensed by the Nuclear Regulatory Authority (*and other organizations having authority for issuing a licence or certificate for using radioactive materials*). The Lead Technical Agency (LTA) for non-medical activities would be the Nuclear Regulatory Authority. The LTA for (*specify activities*) would be the (*specify organization*).

1.4.2. Transportation of radioactive materials

An emergency of this type is one which involves radioactive material being transported outside of a fixed facility licensed by the Nuclear Regulatory Authority. The LTA is the Nuclear Regulatory Authority.

1.4.3. Environmental impact from a foreign source

This type of emergency is one in which radiation from a foreign source poses an actual, potential, or perceived threat to (*Country*). The source may be a foreign power reactor accident (for example, Chernobyl), a damaged nuclear submarine, or some other event occurring abroad and where the source of the radioactive material is located outside of (*Country*). The LTA is the Ministry of the Environment.

1.4.4. Satellite with nuclear materials

This is a special type of emergency in which a spacecraft with nuclear material would land in the territory of (*Country*). The LTA is the Nuclear Regulatory Authority.

1.5. AUTHORITIES

The following are the authorities for the response of the major government agencies participating in this plan (*some ficticious examples are provided below*).

- Atomic Energy Licensing Act
- Environmental Quality Act
- Food Act
- Police Act
- Civil Defence Act
- Broadcasting Act
- Fire Services Act
- Civil Aviation Act
- Road Transport Act
- Road Transport Rules
- Armed Forces Act
- Red Crescent Act
- Fisheries Act
- Medical Act
- Private Hospital Act.

1.6. PLANNING ASSUMPTIONS

The following assumptions and policies have been used to prepare this plan:

1.6.1. Government and private sector response

The owner or operator of an affected nuclear facility has primary responsibility for actions within the boundaries of that facility for providing notification and advice to off-site officials and for minimizing the radiological hazard to the public.

Regional and local authorities, with the assistance of national authorities, have primary responsibility for determining and implementing any measures to protect life, property and the environment in any areas outside the boundaries of a fixed nuclear facility.

1.6.2. Basis for activating the RAD PLAN

The RAD PLAN will be utilized under the following conditions:

(a) When a regional or local authority, other national organizations with jurisdiction, or the private sector requests government support in the event of a radiological emergency; or

(b) When government agencies must respond to meet their statutory obligations in response to a radiological emergency.

1.6.3. Resource commitments

The resources of the government agencies will be made available during radiological assistance operations, subject to prior commitments to fulfil other essential statutory and operational requirements. Agencies committing resources under this plan do so with the understanding that the duration of the commitment will depend on the nature of the emergency and the regional and local resources available.

1.6.4. Requests for government assistance

Requests for radiological monitoring or assessment assistance in emergencies covered by this plan should be directed to (*appropriate organization*); requests for all other types of government assistance related to the non-radiological aspects of a radiological accident should be directed to the (*appropriate Police Authorities or other organization*). Alternatively, regional and local authority requests for assistance, as well as those from the private sector, may be made directly to the individual government agencies with whom they have pre-existing arrangements or relationships.

1.6.5. Reimbursement

The cost of each government agency's participation in support of the RAD PLAN is the responsibility of that agency, unless other agreements exist. This does not preclude any agency from later seeking special appropriations to help cover costs.

1.6.6. Training and exercise

Periodically, the President/Prime Minister's Office will sponsor an exercise of the RAD PLAN with appropriate government agencies, including regional and local authorities. The lessons learned from such exercises will be used to revise and update the RAD PLAN and the plans and operational procedures of individual government agencies.

Government agencies will develop and implement training programs to assure that their agency staff understand the role of the agency in a radiological emergency and their own particular tasks and responsibilities. In addition, agencies, as their resources permit, will assist other national agencies and regional and local authorities with planning and training activities to improve overall capabilities, and will co-operate in drills, tests and exercises.

1.7. RELATIONSHIP TO OTHER PLANS

The RAD PLAN reflects interagency relationships and a concept of operations which are compatible with the following emergency response plans (*some ficticious examples are provided below*):

- Fire Services Emergency Response Plan for Dealing with Hazardous Materials
- Police Plan for Evacuation in Event of an Emergency
- Emergency Plan of Ministry of Health.

2. CONCEPT OF OPERATIONS

2.1. ORGANIZATION OF THE GOVERNMENT RESPONSE

The concept of operations for a response is designed to facilitate the delivery of co-ordinated assistance to government authorities and the private sector. That concept provides for the designation of one agency as the Lead Technical Agency (LTA). The RAD PLAN describes both the responsibility of the LTA and the other government agencies that may be involved in the response.

2.1.1. Lead Technical Agency

In the event of a government response to a radiological emergency, one agency will be referred to as the Lead Technical Agency (LTA). The type of emergency will determine which agency bears that title and carry out the LTA responsibilities. In situations where a government agency regulates the facility, and has authority to take action on-site, that agency will normally be the LTA. Table II.1 shows the various types of emergencies and the agency that will be the LTA under those circumstances. In the event of an unforseen type of emergency not specifically described in the RAD PLAN, government agencies will confer upon receipt of notification of the emergency and will determine which agency will be the LTA.

When an agency that is not the LTA receives an initial notification of a radiological emergency, that agency will notify the LTA. The LTA will confer initially with Nuclear Regulatory Organization; Ministry of Health; Ministry of the Environment and Police. The Ministry of Foreign Affairs will be notified for an emergency with international aspects. The LTA will acknowledge its role and obtain information about each agency's response activity.

2.1.1.1. Operational objective

The LTA will co-ordinate all radiological aspects of the government actions consistent with its authorities to do so. The roles of the LTA and of the other agencies with major response functions under this plan are outlined in Table II.2.

2.1.1.2. Operational location

When possible, the LTA will co-ordinate the radiological aspects of the response activities from an on-scene location. Until the LTA has established on-scene operations, the LTA will accomplish that co-ordination from another LTA facility, usually a headquarters centre.

TABLE II.1. IDENTIFICATION OF LEAD TECHNICAL AGENCIES FOR RADIOLOGICAL EMERGENCIES

TYPE OF EMERGENCY	LEAD TECHNICAL AGENCY
1. Nuclear/radioactive material activities a. Non-medical activities b. Medical activities	(*Specify*)
2. Transportation of radioactive materials	
3. Environmental impact from foreign source	
4. Satellite with nuclear material	

TABLE II.2. RESPONSE OVERVIEW

	RESPONSE ACTIONS	RESPONSIBLE AGENCY
(1)	Co-ordinate all the radiological aspects of the government response to a radiological emergency	LTA
(2)	Co-ordinate off-site radiological monitoring and assessment	
(3)	Develop and evaluate recommendations for off-site protective action measures for the public	LTA with Radiological Advisory Committee
(4)	Maintain order at the scene and co-ordinate government activities for response functions other than radiological assistance, monitoring and assessment	Police
(5)	Co-ordinate release of government information to the public	LTA, Police
(6)	Provide reports of the situation to the National Security Council and others	LTA, Police
(7)	Co-ordinate international aspects and make required international notifications	Ministry of Foreign Affairs
(8)	Co-ordinate all medical aspects of emergency	Ministry of Health
(9)	Manage the response to any fires involved in a radiological emergency	Fire Services

2.1.1.3. Role of the Lead Technical Agency

(1) Notification

(a) Determine the appropriate response to the radiological problem after being notified of a radiological emergency;

(b) Notify other government agencies of the emergency, inform them of the LTA's actions and provide a general assessment of the emergency; and

(c) Notify the Ministry of Foreign Affairs of any radiological release with transboundary implications.

(2) Response

(a) Deploy LTA response personnel to the site, when appropriate;

(b) If LTA personnel are deployed, designate an LTA official at the site of the emergency to manage the technical aspects of the response to the emergency;

(c) Establish an on-scene base of operations to oversee the technical aspects of the response; monitor and support the owner or operator activities; provide technical support to the owner or operator, if requested; and serve as the principal government source of information about on-site radiological conditions; and

(d) Keep other agencies informed of conditions and government actions on-site and provide assessment of any of these conditions that might have significant off-site impact and any means for mitigating the off-site consequences.

(3) Protective action recommendations

The LTA can assist regional and local authorities and other government agencies, by advising them on initial protective action recommendations. In providing such advice, the LTA should use advice from other government agencies with technical expertise on those matters, primarily through the (*specify Radiological Advisory Committee, if one exists; if not, delete this sentence*), when activated.

The LTA's responsibilities for development and presentation of protective action recommendations are to:

(a) Respond to requests from regional or local authorities plus national agencies for technical information and technical assistance;

(b) Provide staff liaison representatives to regional and local authorities or national agencies to help interpret the technical aspects of the emergency on-site and its potential or real off-site radiological consequences;

(c) Review all technical recommendations made by other government agencies exercising statutory authorities before their release to ensure that they are consistent with other radiological recommendations;

(d) Approve the release of off-site radiological monitoring data and assessments to regional and local authorities and national agencies, plus the public;

(e) Prepare a co-ordinated government position on protective action recommendations, whenever time permits, and present to appropriate regional, local and national authorities; and

(f) Assist national, regional and local authorities in implementing protective actions.

(4) Control and co-ordination of information

(a) Provide information about radiological conditions on-site, the status of the facility or radioactive material, and the potential or real off-site radiological effects;

(b) Review and concur in the release of all government generated information related to the on-scene radiological conditions and remain informed of all information related to off-site radiological effects;

(c) Approve the release of government approved off-site radiological assessments; and

(d) Provide information and respond to inquiries about the radiological situation from the President/Prime Minister's Office and the legislature.

2.1.2. Monitoring and assessment

2.1.2.1. Role of Ministry of the Environment (substitute appropriate organization who will be the lead for this area; only one organization should be the lead)

The Ministry of the Environment will have the responsibility for co-ordinating the radiological monitoring and assessment assistance during the response to any radiological emergency. The Ministry of the Environment may establish a co-ordination centre of monitoring and assessment activities to ensure the technical integrity of the environmental data, maintain an accountable database of all environmental data, provide exposure rate and projected dose contours for the affected areas, and any other assessments requested by regional and local authorities or other national agencies.

2.1.2.2. Role of other government agencies

Agencies carrying out statutory responsibilities related to radiological monitoring and assessment during a response will co-ordinate their activities with the Ministry of the Environment. An agency that makes its resources available, does not place itself under the authority of the Ministry of the Environment.

2.1.3. Response co-ordination

2.1.3.1. Operational objective

The objective of response co-ordination is to provide resources and other assistance to affected national, regional and local authorities. The information produced by this co-ordination will be available to all government agencies. It is intended to facilitate operational co-ordination among all the invovled authorities and non-governmental organizations.

*2.1.3.2. **Role of the National Police Authority** (specify the appropriate primary law enforcement agency, national, regional or local; for purposes of this plan, it is assumed that the National Police is the primary law enforcement agency for these emergencies)*

In addition to carrying out its traditional role at the scene of a radiological accident, the Police will co-ordinate all government response activities other than radiological monitoring and assessments which is the responsibility of the Ministry of the Environment. The Police will manage the process of providing other necessary assistance at the scene of a radiological emergency, including those to local and regional governments plus other national agencies.

To accomplish the above operational objective, the Police will:

(1) Establish and maintain a source of integrated, co-ordinated information about the status of all off-site government response activities and make the information known to all pertinent agencies;

(2) Identify and inform government agencies of actual or apparent omissions, redundancies, or conflicts in response activity; and

(3) Monitor the status of the government response to all requests for assistance from the affected regional and local governments and provide this information to the aprropriate authorities.

2.1.3.3. Role of the Fire Services Department

In a radiological accident, the Fire Services Department has the responsibility for extinguishing and controlling fires and protecting life and property in the event of a fire. If Fire Services arrives at the scene of a radiological accident before the Police, they will take appropriate actions to save lives and property, will restrict access to the accident location, notify Police and seek the advice of the LTA.

2.1.3.4. Role of other government agencies

As necessary, other government agencies will consult with the Police and provide liaison officers to the Police to exchange information about their response activities. Agency representatives will address such issues as:

(1) Health and Medical Services;
(2) Food, milk and water contamination;
(3) Relocation and mass care;
(4) Transportation;
(5) Resource Support; and
(6) Communications.

*2.1.3.5. **Technical advice for the decision makers** (this section is to be used if a radiological Advisory Committee has been designated for this purpose)*

In the event of a significant radiological emergency, the Radiological Advisory Committee should be convened by *(specify appropriate organization)* to provide technical advice about radiation and radiological matters to national, regional and local decision makers.

2.1.4. Radiological Advisory Committee (*if such a committee exists*)

While bringing a radiological emergency under control and, later, while carrying out oversight responsibilities, regional, local and national authorities will need advice on a variety of environmental, food and health matters.

The Radiological Advisory Committee is the vehicle by which the expertise from various governmental agencies can develop co-ordinated recommendations and advice. The Radiological Advisory Committee, when convened, will function as follows:

(1) Upon activation of a government response, the (*specify appropriate organization*) will convene a meeting of the Radiological Advisory Committee which will have the following membership:

- National Regulatory Authority;
- Ministry of Health;
- Ministry of the Environment;
- National Police; and
- Fire Services Department.

The chairperson of the Radiological Advisory Committee will be the (*specify the appropriate Minister*) or his designated alternate. Additional representatives may come from the other government agencies, private sector, or academia, depending on the nature of the particular radiological emergency.

(2) The primary function of the group is to provide a mechanism for timely, interagency co-ordination of advice and recommendations to the LTA concerning protective actions, environmental concerns, food contamination, health matters and other related matters. The chairperson or their designee will provide recommendations developed by the group directly to the LTA.

2.1.5. Joint Information Co-ordination System

2.1.5.1. Operational objective

This plan is predicated on the premise that public information co-ordination is most effective when national, local or regional, and other relevant information sources participate jointly. This plan refers to the process of collecting, co-ordinating and disseminating public information in emergencies as the 'Joint Information Co-ordination System'. The term 'System' refers collectively to the personnel, facilities, equipment, and procedures, which systematically link together all public information officers and other sources from the national, local, regional authorities, and to the extent possible, from the private sector. The purpose of linking these information sources, ideally to one primary location, is to provide a mechanism for sharing data and information so that each response agency knows what the other agencies are telling the media. Co-ordination means that the principal parties should be notified of the content of information to be released to ensure its consistency with the total information available.

The objectives of the joint information co-ordination system in a radiological emergency are to accomplish the following:

(1) Compile information about status of the emergency, response actions, and instructions for the affected population;

(2) Co-ordinate all information from various sources with the other national, local, regional and non-governmental response organizations;

(3) Provide a system whereby various sources can work cooperatively, yet maintain their independence in disseminating information;

(4) Disseminate timely, consistent and accurate information to the public and the news media; and,

(5) Establish co-ordinated arrangements for dealing with rumours and citizen inquiries.

2.1.5.2. Operational location

The process of co-ordinating public information also assumes that key decision makers (national, local and regional) and other authoritative sources of information will not always be in one location. As a minimum, public information will be sought at the primary news and information centre, at other locations on-scene, from local and regional authorities, and at various locations in the capital.

Responding organizations are encouraged to collocate a spokesperson from each major response organization at a single location. The media should be informed that this centre is the primary source of public information from the national, local and regional spokesperson. This primary source of public information would be called the Joint Information Centre (JIC).

For some emergency situations, it may be necessary to release information regarding public health and safety prior to the establishment of a JIC. When this is the case, government agencies should notify their headquarters and the LTA of the intended release in advance, whenever possible, or as soon as possible after the information has been released.

2.1.5.3. Role of the Lead Technical Agency

The LTA, in consultation with the Police, will determine whether a JIC will be needed and will co-operate with the Police in determining the JIC location. The LTA will be responsible for information on the radiation and radiological aspects of the emergency.

2.1.5.4. Role of the Police

The Police will be responsible for information on the status of the overall government response and specific Police activities. The Police will implement procedures for providing information to and for obtaining information from all government agencies participating in the response.

2.1.5.5. Role of other participating agencies

All government agencies with an operational response role under the RAD PLAN will participate in the joint information co-ordination system. Individual agencies should

disseminate emergency information in their respective areas of responsibility. Each agency will provide information on the status of its response and on technical information that it has developed or possesses.

2.2. STAGES OF THE GOVERNMENT RESPONSE

The government response begins with the notification of an emergency or potential emergency. Initial actions will be taken by local and regional authorities. When the circumstances warrant, government agencies at the national level will activate and deploy additional resources to the scene. As the situation comes under control, the various government agencies will deactivate their response to the radiological accident.

2.2.1. Notification

The owner or operator of the facility or radiological activity is generally the first to become aware of a radiological emergency, and is responsible for notifying the local, regional and national authorities. The owner or operator can ask for assistance directly from an appropriate government agency with which they have preexisting arrangements or relationships.

The LTA will be notified at their offices or via emergency telephone numbers provided to the expected first responders in an emergency, i.e., Police and Fire Services. The LTA will make further notifications, in accordance with pre-established procedures. In these notifications, the LTA will provide the agencies called with a general assessment of the emergency including location and nature of the event, an assessment of the severity of the problem as known, a description of the LTA's response, and any follow-on actions anticipated by the LTA.

2.2.2. Activation

Once notified, each agency will assess the need to initiate its response based on the situation reported. A government response will begin upon receipt of notification and consists of the following steps depending on the circumstances of the emergency:

(1) Alerting or activating various agency components;

(2) Activating agency emergency response teams and deploying them to the scene;

(3) Establishing bases of operation at the scene of the radiological emergency to assure that the government response components are organized and consistent; and

(4) At the national level, determining whether assistance is required and whether local or regional authorities need additional assistance.

2.2.3. Deployment

Some emergencies will not require full-scale response and a response at the regional or national level might proceed only through notification.

If an agency decides to respond, it will inform the Police and provide the following information:

(a) The name and location of a designated agency contact;

(b) The telephone number at which personnel can be contacted at headquarters or at the scene; and

(c) The name of the primary official to deploy to the scene, an estimated time of arrival and location at the emergency site.

The LTA, the Police and responsible local and regional authorities will keep each other informed of the status of the response efforts. The LTA, Police and Fire Services will work together at the scene to ensure that each has an accurate understanding of the total situation throughout the emergency.

2.2.4. Recovery[1]

Recovery planning will generally not take place until after the initiating conditions of the emergency have stabilized and immediate actions to protect the public health and safety and property have been accomplished.

The LTA will co-ordinate the activity of national, local and regional agencies involved in decontaminating the affected area and controlling the radioactive material. The Radiological Advisory Committee will develop technical recommendations for the LTA to use in this phase. Other government agencies should provide expertise in particular areas and assist the Radiological Advisory Committee in the development of recommendations.

2.2.5. Response deactivation

Each agency will discontinue response operations when it is determined that their assistance is no longer required or when its statutory responsibilities have been fulfilled. Prior to discontinuing its response operation, each agency will discuss its intent to do so with the LTA and Police. Agencies providing radiological monitoring and assessment assistance will discuss discontinuation with the Ministry of the Environment.

The radiological monitoring and assessment activities will be terminated when the Ministry of the Environment, after consultation with the LTA, local and regional officials determines that there is no longer a threat to the public health and safety or to the environment.

The LTA will consult with the Police and determine when the information co-ordination operations at the JIC should be terminated. This will occur normally at a time when the rate of information generated has decreased to the point where it can be handled through the normal day-to-day co-ordination process. The LTA will inform the other participants of the intention to deactivate information co-ordination operations at the JIC and advise them of the procedures for continued co-ordination of information pertinent to recovery from the radiological emergency.

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[1] The term 'recovery' as used here encompasses any action dedicated to the continued protection of the public and resumption of normal activities in the affected area.

2.3. INTERNATIONAL CO-ORDINATION

Although the geographic scope of the RAD PLAN is limited (*Country*) and its territorial waters, it is recognized that both radiological emergencies in other countries and domestic radiological emergencies near (*Country*) international borders could require international interfaces. In such cases, the Ministry of Foreign Affairs will work closely with other government agencies concerning any international responsibilities.

2.3.1. Foreign radiological emergencies

In the event of a radiological emergency outside of (*Country*) that has a real or potential impact on (*Country*)[2], the Ministry of Foreign Affairs will co-ordinate contacts with foreign governments except in cases where existing agreements permit direct interagency communication.

When a foreign radiological emergency comes within the scope of the RAD PLAN, the Ministry of the Environment (*or other appropriate ministry*) will be the LTA. The LTA will keep the Ministry of Foreign Affairs informed of all government response activities co-ordinated in accordance with the RAD PLAN.

2.3.2. Domestic radiological emergencies with foreign impact

In the event of a domestic radiological emergency with potential trans-boundary consequences, the Ministry of Foreign Affairs will co-ordinate all contacts with foreign governments and agencies except where existing agreements permit direct exchange of information. Agencies acting under such agreements should keep the Ministry of Foreign Affairs informed of consultations with foreign counterparts at all times.

With respect to the responsibilities of the government under the Convention on Early Notification in the Event of a Nuclear Accident, the LTA should assure that an initial notification of the nuclear accident is made to the IAEA in Vienna and they are provided with additional technical information during the response to such an emergency. The LTA can request the Ministry of Foreign Affairs or the designated Point of Contact for this convention to transmit the messages. The LTA should assure that the Ministry of Foreign Affairs is kept continuously informed of all such communications with the IAEA.

2.3.3. Requests for radiological assistance

In the event of a radiological emergency which requires the activation of the RAD PLAN, requests for radiological assistance from the international community are anticipated. Arrangements already exist for making such requests, particularly with the IAEA and the World Health Organization. In order to facilitate obtaining such necessary assistance, government technical support agencies should make these requests directly in keeping with established procedures and within their area of competence, after consultation with the LTA, and where necessary, with the Ministry of Foreign Affairs. The Ministry of Foreign Affairs should be kept fully informed of all requests for foreign assistance by the agency making such a request.

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[2] It is expected that the appropriate government authorities will be informed of a major nuclear accident by the accident State and/or the IAEA under the terms of the Convention on Early Notification of a Nuclear Accident.

3. GOVERNMENT AGENCY RESPONSE MISSIONS, CAPABILITIES, RESOURCES, REFERENCES AND AUTHORITIES

This section contains summary information about the following government agencies:

- Nuclear Regulatory Authority
- Ministry of Health
- Ministry of the Environment
- Meteorological Service
- President/Prime Minister's Office
- Ministry of Foreign Affairs
- Ministry of Information
- Ministry of Defence
- Ministry of Agriculture
- National Police Authorities
- Department of Civil Defence
- Fire Services Department
- Ministry of Transport
- Marine Department
- Ministry of Social Affairs
- Red Cross/Red Crescent.

The summary information for each agency contains:

(1) A response mission statement;
(2) A description of the agency's response capabilities and resources;
(3) The agency's response plan and procedure references;
(4) Sources of specific agency authority.

(*Examples are provided for some organizations for reference.*)

3.1. NUCLEAR REGULATORY AUTHORITY

(1) Summary of response mission

The Nuclear Regulatory Authority has the responsibility to issues licences for all uses of radioactive material in (Country) and to inspect such activities periodically. In a radiological accident, the Nuclear Regulatory Authority will: (1) be responsible for assuring that licensees carry out their responsibilities and the conditions of their license; (2) act as LTA in those areas specified in the RAD PLAN; and (3) provide advice to licences, as necessary, on additional steps to be taken to mitigate the consequences of the accident and avoid harm to the public and the environment.

(2) Capabilities and resources

The Nuclear Regulatory Authority has an emergency response team available on a 24 hour basis. This group includes experienced and well trained personnel, appropriate radiation monitoring equipment to assess the radiological situation for an accident involving radioactive materials.

(3) Nuclear Regulatory Authority references

- Atomic Energy Licensing Act
- Radiation Protection Licensing Regulations
- Radiation Protection (Basic Safety Standard) Regulations
- Radiation Protection (Transport) Regulation
- IAEA Safety Series Nos 72, 91, 87 and 102.

(4) Nuclear Regulatory Authority specific authorities

- Atomic Energy Licensing Act.

3.2. MINISTRY OF HEALTH

(1) Summary of response mission

In the event of radiological emergency, the Ministry of Health will be responsible for providing or obtaining appropriate medical care for overexposed or contaminated individuals. Where a radiological accident involves the medical use of radioactive materials, the Ministry of Health will provide medical advice to the LTA. The Ministry of Health is also be responsible for monitoring the long term health problems that could arise due to the radiological event.

(2) Capabilities and resources

The Ministry of Health has personnel, laboratory facilities and some radiological instruments that can be deployed to assess the situation in a radiological accident and render medical care to the victims in the event of a radiological accident. The Ministry of Health hospitals are open for 24 hours daily and are capable of providing immediate medical care at any time needed. The Ministry of Health continues to train various medical personnel in the care and handling of radiation exposed individuals. The Ministry of Health has a whole body counter that can be utilized to do internal contamination monitoring of individuals who may have ingested or inhaled radioactive material. In addition, the Ministry of Health has the capability to do chromosomal aberration studies which can assist medical personnel in determining the radiation dose received by individuals in an accident.

(3) Ministry of Health references

- Guide to Radiological Emergency
- Guidelines for the Management of Radiation Accidents Occurring in a Hospital (Ministry of Health)
- The Principles and General Procedures for Handling Emergency and Accidental Exposures of Workers (ICRP Publication 28).

(4) Ministry of Health authorities

- Atomic Energy Licensing Act
- Radiation Protection Regulations
- Radiation Protection (Basic Safety Standard) Regulation
- Radiation Protection (Transport) Regulation.

3.3. MINISTRY OF THE ENVIRONMENT

(1) Summary of response mission

In all radiological emergencies, the Ministry of the Environment will perform radiological monitoring and analyses and will serve as the coordinator for any governmental radiological monitoring and assessment assistance. the Ministry of the Environment maintains radiological resources which are available for emergency deployment and which can be used to support the Ministry of the Environment role, including assistance in decontamination and waste disposal.

(2) Capabilities and resources

The Ministry of the Environment has trained personnel, radiological instruments, mobile equipment and counting facilities. Their resources form the foundation of the national capability of radiological assistance which can be provided in any radiological emergency.

(3) Ministry of the Environment references

(4) Ministry of the Environment specific authorities

3.4. METEOROLOGICAL SERVICE

(1) Summary of response mission

During a radiological emergency, the Meteorological Service will monitor and provide to the Lead Technical Agency the actual weather conditions in and around the area of the accident for the assessment of the movement of airborne radioactive material. the Meteorological Service will also provide the LTA with weather forecasts. In the case of emergency from a foreign source, information from IAEA via the Global Telecommunication System (GTS) of the World Meteorological Organization (WMO) will be immediately transmitted to the LTA. The Meteorological Service is also prepared to collect and send samples of rainwater and exposed filters from its air pollution monitoring stations to the Ministry of the Environment for radioactivity analysis.

(2) Capabilities and resources

The Meteorological Service has a network of meteorological stations, radar stations, upper-air stations and satellite stations making regular meteorological observations. The Meteorological Service is linked to meteorological centres worldwide through the GTS for

exchange of meteorological information. Under a co-operative arrangement agreed upon by WMO and IAEA, the GTS can be used for exchange of radiological and supplementary meteorological data related to nuclear accidents. In addition, the Meteorological Service has very well trained personnel to continuously observe and report weather conditions throughout the country and to provide weather forecasts for aviation and other users. Such real time weather information and forecasts will be provided to the LTA at the time of a radiological emergency.

(3) Meteorological Service references

(4) Meteorological Service specific authorities

3.5. PRESIDENT/PRIME MINISTER'S OFFICE

(1) Summary of response mission

(2) Capabilities and resources

(3) President/Prime Minister references

(4) President/Prime Minister specific authorities

3.6. MINISTRY OF FOREIGN AFFAIRS

(1) Summary of response mission

(2) Capabilities and resources

(3) Ministry of Foreign Affairs references

(4) Ministry of Foreign Affairs specific authorities

3.7. MINISTRY OF INFORMATION

(1) Summary of response mission

The Ministry of Information can support a government response to a radiological accident by: (1) providing instructions via television and radio to the public on protective actions that are recommended by the government; (2) provide factual information to the general public on the radiological accident; (3) assist the government response by using its facilities to respond to rumours that are creating concern with the public.

(2) Capabilities and resources

(3) Ministry of Information references

(4) Ministry of Information specific authorities

3.8. MINISTRY OF DEFENCE

(1) Summary of response mission

(2) Capabilities and resources

(3) Ministry of Defence references

(4) Ministry of Defence specific authorities

3.9. MINISTRY OF AGRICULTURE

(1) Summary of response mission

The Ministry of Agriculture can provide support to the primary responders in a radiological accident in the following ways: (1) provide advice about the agricultural practices in any areas that may have been contaminated by the accident; and (2) obtain samples of agricultural products for radiological analysis by other organizations

(2) Capabilities and resources

Then Ministry of Agriculture has an extensive staff throughout the country which is knowledgeable about the agricultural practices in their area and familiar with farmers and other agricultural workers in their locale.

(3) Ministry of Agriculture references

(4) Ministry of Agriculture specific authorities

3.10. NATIONAL POLICE AUTHORITY (POLICE)

(1) Summary of response mission

(2) Capabilities and resources

(3) Police references

(4) Police specific authorities

3.11. DEPARTMENT OF CIVIL DEFENCE

(1) Summary of response mission

To provide support services to relevant government agencies in order to minimize the effects of a radiological incident or emergency on people and property.

(2) Capabilities and resources

The Civil Defence Department maintains a Civil Defence Corps. The Corps is comprised of trained and disciplined uniformed staff that could be deployed to carry out the following disaster relief duties to:

(i) render first aid to the injured;
(ii) rescue trapped victims in collapse buildings;
(iii) assist the Fire Services Department in firefighting;
(iv) assist the Welfare Department in the manning of relief centres;
(v) assist the relevant authorities in the evacuation of people.

The Civil Defence Department has the following resources:

(i) personnel carrier vehicles;
(ii) first aid equipment;
(iii) rescue equipment;
(iv) fire fighting equipment;
(v) cooking and serving utensil;
(vi) personnel protective and safety equipment for rescue and fire fighting;
(vii) lighting and communication equipment for Corps operations.

(3) Civil Defence references

(4) Civil Defence specific authorities

3.12. FIRE SERVICES DEPARTMENT

(1) Summary of response mission

In a radiological accident, the Fire Services will take all lawful measures to extinguish and control any fires and protect life and property from fires involved in the incident. Where the Fire Services are the first responder to an incident, they will take appropriate actions to save lives and property, restrict access to the accident location, notify Police and seek the advice of the LTA. Fires Services will also participate in any investigation of a radiological accident involving fires and assist in the recovery phase of such an accident.

(2) Capabilities and resources

(3) Fire Services references

(4) Fire Services specific authorities

3.13. MINISTRY OF TRANSPORT

(1) Summary of response mission

(2) Capabilities and resources

(3) Ministry of Transport references

(4) Ministry of Transport specific authorities

3.14. MARINE DEPARTMENT

(1) Summary of response mission

(2) Capabilities and resources

(3) Marine Department references

(4) Marine Department specific authorities

3.15. MINISTRY OF SOCIAL AFFAIRS

(1) Summary of response mission

(2) Capabilities and resources

(3) Ministry of Social Affairs references

(4) Ministry of Social Affairs specific authorities

3.16. RED CROSS/RED CRESCENT

(1) Summary of response mission

(2) Capabilities and resources

(3) Red Crescent references

(4) Red Crescent specific authorities

LIST OF ABBREVIATIONS

LTA	Lead Technical Agency
JIC	Joint Information Centre
Police	National Police Authority
RAD PLAN	National Emergency Response Plan For Radiological Accidents

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DEFINITIONS

Assessment.

The evaluation and interpretation of radiological measurements and other information to provide a basis for decision making. Assessment can include projections of off-site radiological impact.

Co-ordinate.

To advance systematically an exchange of information among principals who have or may have a need to know certain information in order to carry out their role in a response.

Monitoring.

The use of sampling and radiation detection equipment to determine the levels of radiation.

Nuclear facilities.

Nuclear installations that use or produce radioactive materials in their normal operations.

Off-site.

The area outside the boundary of the on-site area. For emergencies occurring at fixed nuclear facilities, 'off-site' generally refers to the area beyond the facility boundary. For emergencies that do not occur at fixed nuclear facilities and for which no physical boundary exists, the circumstances of the emergency will dictate the boundary of the off-site area.

On-scene.

The area directly affected by radiological contamination and environs. On-scene includes on-site and off-site areas.

On-site.

The area within (a) the boundary established by the owner or operator of a fixed nuclear facility, or (b) the boundary established at the time of the emergency by the Police.

Owner or operator.

The organization that owns or operates the nuclear facility or carrier or cargo that causes the radiological emergency. The owner operator may be a government agency or a private business.

Protective action recommendations.

Government advice to appropriate decision makers on emergency measures they should consider asking the public to take in order to avoid or reduce their exposure to radiation. This includes advice concerning:

(1) Guidance on actions necessary to avoid or minimize exposure to residual radiation or exposure through the ingestion pathway; and

(2) Guidance that may be issued to members of the public on returning to an area affected by a radiological emergency, either permanently or for short-term emergency actions.

Radiological emergency.

A radiological incident that poses an actual, potential, or perceived hazard to public health or safety or loss of property.

Recovery.

Recovery, in this plan, includes all types of post-emergency actions dedicated to the continued protection of the public or to promoting the resumption of normal activities in the affected area.

Transportation emergency.

For the purpose of this plan, any emergency that involves a transportation vehicle or shipment containing radioactive materials.

Transportation of radioactive materials.

The loading, unloading, movement, or temporary storage en route of radioactive materials.

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