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**REGULATION N°006/R/RS-NRP/RURA/2021 OF  
16/11/2021 ON RADIOLOGICAL AND NUCLEAR  
EMERGENCY PREPAREDNESS AND RESPONSE**

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## **PREAMBLE**

The Regulatory Board;

Pursuant to Law n°09/2013 of 01/03/2013 establishing Rwanda Utilities Regulatory Authority (RURA) and determining its mission, powers, organization and functioning;

Pursuant to the Law n°59/2017 of 24/1/2018 Governing Radiation Protection;

Pursuant to the General Regulation n°001/R/RS-RP/RURA/2019 of 15/11/2019 Governing Radiation Safety in Rwanda;

Based on the recommendations made during the consultative meeting held on May 19, 2021 between RURA and different stakeholders in the sector;

After consideration and approval in its meeting of 16/11/2021;

Hereby issue the following Regulation:

## **CHAPTER I: GENERAL PROVISIONS**

### **Article 1: Purpose of this Regulation**

The purpose of this regulation is to establish the regulatory requirements for preparedness and response (EPR) for a nuclear or radiological emergency, for all the facilities and activities in Rwanda

### **Article 2. Scope.**

This regulation applies in relation to preparedness and response to nuclear or radiological emergencies, whether the emergency follows the occurrence of a natural event, a human error, a mechanical or other failure, or a nuclear security event.

### **Article 3: Definitions of Terms**

For the purpose of this Regulation, the terms below shall have the following meanings:

1. **"Accident"** means any unintended event, including operating errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection or safety;
2. **"Alert"** means an emergency that warrants taking actions to assess and to mitigate the potential consequences at the facility;
3. **"All-hazards approach"** means an integrated approach for a nuclear or radiological emergency that focuses on capacities and capabilities that are critical for preparedness and response to a full spectrum of emergencies (e.g. natural disaster, nuclear security event, etc.);
4. **"Arrangements"** means the integrated set of infrastructural elements, put in place at the preparedness stage, that are necessary to provide the capability for performing a specified function or task required in response to a nuclear or radiological emergency, and are also called as emergency arrangements;
5. **"Collective dose"** means the total radiation dose incurred by a population;
6. **"Conventional emergency"** means any emergency other than a nuclear or radiological emergency;
7. **"Coordinating mechanism"** means mechanism for ensuring coordination that may involve an existing body or a newly established body (e.g. a committee consisting of representatives from different organizations and bodies) that has been given the authority to ensure the necessary coordination;
8. **"Dangerous source"** means a source that could, if not under control, give rise to exposure sufficient to cause severe deterministic effects;

9. "**Deterministic effect**" means a radiation induced health effect for which generally a threshold level of dose exists above which the severity of the effect is greater for a higher dose;
10. "**Early protective action**" means a protective action in the event of a nuclear or radiological emergency that can be implemented within days to weeks and still be effective;
11. "**Effective dose**" means a measure of dose designed to reflect the risk associated with the dose, calculated as the weighted sum of the dose equivalents in the different tissues of the body;
12. "**Equivalent dose**" means a measure of the radiation dose to tissue where an attempt has been made to allow for the different relative biological effects of different types of ionizing radiation.
13. "**Emergency Action Level (EAL)**" means a specific, pre-determined criterion for observable conditions used to detect, recognize and determine the emergency class;
14. "**Emergency class**" means a set of conditions that warrant a similar immediate emergency response. This term is used for communicating, to the response organizations and to the public, the level of response needed;
15. "**Emergency classification**" means the process whereby an authorized official classifies an emergency in order to declare the applicable emergency class;
16. "**Emergency exposure situation**" means a situation of exposure that arises as a result of an accident, a malicious act or other unexpected event, and requires prompt action in order to avoid or to reduce adverse consequences;
17. "**Emergency plan**" means a description of the objectives, policy and concept of operations for the response to an emergency and of the structure, authorities and responsibilities for a systematic, coordinated and effective response;
18. "**Emergency planning distance**" means the extended planning distance (EPD) and the ingestion and commodities planning distance (ICPD);
19. "**Emergency planning zone**" means the precautionary action zone (PAZ) and the urgent protective action planning zone (UPZ);
20. "**Emergency preparedness**" means the capability to take actions that will effectively mitigate the consequences of an emergency for human life, health, property and the environment;

21. **"Emergency response"** means the performance of actions to mitigate the consequences of an emergency for human life, health, property and the environment;
22. **"Emergency worker"** means a person having specified duties as a worker in response to an emergency.
23. **"Existing exposure situation"** means a situation of exposure that already exists when a decision on the need for control is necessitated to be taken.
24. **"Extended Planning Distance (EPD)"** means an area around a facility for which emergency arrangements are made to conduct monitoring following the declaration of a general emergency and to identify areas warranting emergency response actions to be taken off the site within a period after a significant radioactive release that would allow the risk of stochastic effects among members of the public to be effectively reduced.
25. **"Facility emergency"** means an emergency that warrants taking protective actions and other response actions at the facility and on the site but does not warrant taking protective actions off the site;
26. **"First responders"** means the first members of the license's emergency response organization and off-site authorities to respond at the site of an emergency;
27. **"General emergency"** means an emergency that warrants taking precautionary urgent protective actions, urgent protective actions, and early protective actions and other response actions on the site and off the site;
28. **"Generic criteria"** means levels for the projected dose, or the dose that has been received, at which protective actions and other response actions are to be taken;
29. **"Graded approach"** means a process or method for a system of control, such as safety system, in which the stringency of the control measures and conditions to be applied is commensurate, to the extent practicable, with the likelihood and possible consequences of, and the level of risk associated with, a loss of control;
30. **"Hazard assessment"** means assessment of hazards associated with facilities, activities or sources in order to identify those events and the associated areas for which such protective actions and other response actions may be required that would be effective in mitigating the consequences of such events;
31. **"Helper in an emergency"** means member of the public who willingly and voluntarily helps in the response to a nuclear or radiological emergency;
32. **"Ingestion and Commodities Planning Distance (ICPD)"** means an area around a facility for which emergency arrangements are made to take effective emergency response actions following the declaration of a general emergency in order to reduce the risk of stochastic effects among members of the public and to mitigate non-radiological consequences as a result of the distribution, sale and consumption of food, milk and drinking water and the use

of commodities other than food that may have contamination from a significant radioactive release;

33. **"Inner cordoned off area"** means an area established by first responders in an emergency around a potential radiation hazard, within which protective actions and other emergency response actions are taken to protect first responders and members of the public from possible exposure and contamination;
34. **"Integrated emergency exercise"** means emergency exercise in which both on-site and off-site emergency plans and their integration with other plans including contingency plan, physical protection plan, etc. are tested;
35. **"Interested party"** means a person or group that is directly or personally concerned with a situation and is likely to be affected by its results
36. **"Justification"** means the process of determining, for an emergency exposure situation or an existing exposure situation, whether a proposed protective action or remedial action is likely, overall, to be beneficial;
37. **"Licensee"** means holder of a valid license issued by the Regulatory Authority;
38. **"Management of nuclear or radiological emergency"** means all administrative and operational activities involved in the preparedness and response to a nuclear or radiological emergency;
39. **"Management system"** means a set of interrelated or interacting elements (system) for establishing policies and objectives, and enabling the objectives to be achieved in an efficient and effective manner;
40. **"Mitigatory action"** means immediate action to be taken by the licensee or off-site authorities to reduce the potential for conditions to develop, or to mitigate source conditions that would result in exposure or a release of radioactive material requiring emergency actions on or off the site;
41. **"Non-radiological consequences"** means adverse psychological, societal or economic consequences of a nuclear or radiological emergency or of an emergency response affecting human life, health, property or the environment;
42. **"Notification"** means a set of actions taken upon detection of emergency conditions with the purpose of alerting promptly all organizations with responsibility for emergency response in the event of such conditions.;
43. **"Notification point"** means a designated organization with which arrangements have been made to receive notification and to initiate promptly the predetermined actions to activate a part of the emergency response;

44. **"Nuclear"** Strictly relating to a nucleus; relating to or using energy released in nuclear fission or fusion. **"Nuclear material"** refers to the metals **uranium, plutonium, and thorium**, in any form, according to the IAEA. This is differentiated further into "source material", consisting of natural and depleted uranium, and **"special fissionable material"**, consisting of **enriched uranium (U-235)**, uranium-233, and **plutonium-239**. Uranium ore concentrates are considered to be a "source material", although these are not subject to safeguards under the Nuclear Non-Proliferation Treaty.
45. **"Nuclear or radiological emergency"** means an emergency in which there is, or is perceived to be, a hazard due to the energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction; or radiation exposure, and is also called as an emergency;
46. **"Nuclear security event"** means an event that has potential or actual implications for nuclear security that must be addressed. Such events include criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities or associated activities.
47. **"Off-site"** means area outside the site;
48. **"Off-site authorities"** means organizations designated or recognized by a licensee or local, provisional or federal government as being responsible for managing or implementing any aspect of an emergency response. This also includes those organizations or services necessary to support the management and conduct of an emergency response, such as meteorological services;
49. **"On-site"** means area within the site;
50. **"Operating personnel"** means individual workers engaged in the operation of an authorized facility or the conduct of an authorized activity;
51. **"Operational criteria"** means values of measurable quantities or observable conditions to be used in response to a nuclear or radiological emergency in order to determine the need for appropriate protective actions and other response actions.
52. **"Operational Intervention Level (OIL)"** means a set level of a measurable quantity that corresponds to generic criterion. Operational intervention levels are typically expressed in terms of dose rates or of activity of radioactive material released, time integrated air activity concentrations, ground or surface concentrations, or activity concentrations of radionuclides in environmental, food or water samples.
53. **"Optimization"** means the process of determining the level of protection and safety that would result in the magnitude of individual doses, the number of individuals (workers and members of the public) subject to exposure and the likelihood of exposure being as low as reasonably achievable (ALARA), taking into account the economic and social factors;

54. **"Other response action"** means an emergency response action other than a protective action such as medical examination, consultation and treatment; registration and long term medical follow-up; control of access and traffic restrictions; provision of psychological counseling; and public information and other actions for mitigating non-radiological consequences and for public reassurance;
55. **"Physical protection"** means measures (including structural, technical and administrative protective measures) taken to prevent an adversary from achieving an undesirable consequences (such as sabotage, or the unauthorized removal of nuclear material in use, storage or transport) and to mitigate or minimize the consequences if the adversary initiates such a malicious act;
56. **"Planned exposure situation"** means a situation of exposure that arises from the planned operation of a source or from a planned activity that results in an exposure from a source;
57. **"Precautionary Action Zone (PAZ)"** means an area around a facility for which emergency arrangements have been made to take urgent protective actions in the event of a nuclear or radiological emergency in order to avoid or to minimize severe deterministic effects off the site.
58. **"Precautionary urgent protective action"** means an urgent protective action taken before or shortly after a release of radioactive material, or an exposure, on the basis of the prevailing conditions in order to avoid or to minimize severe deterministic effects;
59. **"Preparedness stage"** means the stage or phase at which arrangements for an effective emergency response are established prior to a nuclear or radiological emergency;
60. **"Projected dose"** means the dose that would be expected to be received if planned protective actions were not taken;
61. **"Protective action"** means an action for the purposes of avoiding or reducing doses that might otherwise be received in an emergency exposure situation or an existing exposure situation;
62. **"Radiological assessor"** means a person or team who in the event of a nuclear or radiological emergency assists the licensee or off-site authorities by performing radiological surveys, performing dose assessments, controlling contamination, ensuring the radiation protection of emergency workers and formulating recommendations on protective actions and other response actions;
63. **"Radiological consequences"** means consequences of a nuclear or radiological emergency causing exposures that have effects on human health and safety, quality of life, property or the environment;

64. **"Reference level"** means for an emergency exposure situation or an existing exposure situation, the level of dose, risk or activity concentration above which it is not appropriate to plan to allow exposures to occur and below which optimization of protection and safety would continue to be implemented;
65. **"Residual dose"** means the dose expected to be incurred after protective actions have been terminated (or after a decision has been taken not to take protective actions). Residual dose applies for an existing exposure situation or an emergency exposure situation;
66. **"Security system"** means an integrated set of security measures;
67. **"Significant release of radioactive material"** means a radioactive release that could lead to severe deterministic effects off the site and thus warrants taking protective actions or other response actions off the site;
68. **"Site"** means a geographical area that contains a licensed facility, authorized or licensed activity or source, and within which the management of the licensed facility or activity or first responders may directly initiate emergency response actions;
69. **"Site area emergency"** means an emergency that warrants taking protective actions and other response actions on the site and in the vicinity of the site;
70. **"Source"** means anything that may cause radiation exposure, such as by emitting ionizing radiation or by releasing radioactive substances or radioactive material, and can be treated as a single entity for purposes of protection and safety. A complex or multiple installation situated at one location or site may, as appropriate, be considered a single source for the purposes of application of this regulation;
71. **"Special facility"** means a facility for which predetermined facility specific actions need to be taken if urgent protective actions are ordered in its locality in the event of a nuclear or radiological emergency. Such facilities may include chemical plants that cannot be evacuated until certain actions have been taken to prevent fire or explosions and telecommunication centers that must be staffed in order to maintain communication services;
72. **"Special population group"** means members of the public for whom special arrangements are necessary to be made in order for effective protective actions to be taken in the event of a nuclear or radiological emergency. This group may include persons with disabilities, hospital patients and prisoners;
73. **"Stochastic effect"** means a radiation induced health effect, the probability of occurrence of which is greater for a higher radiation dose and the severity of which (if it occurs) is independent of dose.

74. **"Transient population groups"** means those members of the public who are residing for a short period of time (days to weeks) in a location (such as a camping ground) that can be identified in advance.
75. **"Transnational emergency"** means a nuclear or radiological emergency of actual, potential or perceived radiological significance for more than one State.
76. **"Unforeseen location"** means any location where there is a significant likelihood of encountering a dangerous source, contaminated commodity and other nuclear and radioactive material that is not under regulatory control (e.g. scrap metal processing facilities, public places, transportation routes, border crossing points, seaports, airports, etc.);
77. **"Urgent protective action"** means a protective action in the event of an emergency which must be taken promptly (normally within hours) in order to be effective, and the effectiveness of which will be markedly reduced if it is delayed.
78. **"Urgent protective action planning zone (UPZ)"** means an area around a facility for which arrangements have been made to take urgent protective actions in the event of a nuclear or radiological emergency in order to avert doses off the site.
79. **"Worker"** means any person who works, whether full time, part time or temporarily, for an employer and who has recognized rights and duties in relation to occupational radiation protection. A self-employed person is regarded as having the duties of both an employer and a worker.

## **CHAPTER II. GENERAL REQUIREMENTS**

### **Article 4. General Responsibilities**

In order to ensure the effective response in case of a nuclear or radiological emergency, the licensee shall:

- (a) establish an adequate capability including the infrastructure needed for an effective response, and set up arrangements for preparedness and response for a nuclear or radiological emergency for all facilities or activities under its management,
- (b) Save lives of affected workers and/or public under the responsibility of the licensee;
- (c) Render first aid, provide for critical medical treatment and for the treatment of radiation injuries;
- (d) Avoid or minimize severe deterministic effects;
- (e) Reduce the risk of stochastic effects;
- (f) Regain control of the situation and mitigate radiological consequences;
- (g) Keep the public informed and maintain public trust;
- (h) Mitigate, to the extent practicable, non-radiological consequences;
- (i) Protect, to the extent practicable, property and the environment; and
- (j) Prepare, to the extent practicable, for the resumption of normal social and economic activity. Develop and implement an emergency management system within the integrated management system of the organization, for the facilities and activities under his responsibilities. Use the emergency preparedness categories provided in Annex I of this regulation to apply a graded approach for developing justified and optimized arrangements for preparedness and response for a nuclear or radiological emergency.

### **Article 5. On-site Emergency Management System in regard to the emergency management system, the licensee shall:**

- (a) ensure that the emergency management system is designed to be commensurate with the results of the hazard assessment, and that it enables an effective and efficient emergency response for a nuclear or radiological emergency;
- (b) ensure that the on-site emergency management system is integrated, to the extent practicable, into the all-hazards emergency management system of the off-site local and national authorities;

### **Article 6. Roles and Responsibilities for Emergency Preparedness and Response**

The licensee shall ensure that roles and responsibilities for preparedness and response for a nuclear or radiological emergency are clearly specified assigned and understood in advance, and the line of succession for decision-making positions in the emergency response organization has been identified and is in place.

For radiological facilities and activities, the licensee shall make arrangements for the recovery and rehabilitation of the affected workers, public and the environment as prescribed in the Regulations for the Licensing of Radiation Facility (ies) other than Nuclear Installation(s), whereas, for the nuclear installations, the licensee shall be liable for nuclear damage under the provisions of the Radiation Protection Law.

The licensee shall:

- a) ensure that the necessary human, technical, financial and other resources are available to prepare for and to deal with both radiological and non-radiological consequences of a nuclear or radiological emergency;
- b) establish, maintain and demonstrate leadership in relation to preparedness and response for a nuclear or radiological emergency;
- c) demonstrate the emergency arrangements in an exercise before radioactive material is brought to the facility, or nuclear material is introduced into the system of nuclear installations;
- d) establish an internal coordinating mechanism to be functional at the preparedness stage, consistent with its emergency management system, with the following functions to:
  - (a) conduct hazard assessment of the facilities and/or activities under responsibility, and periodic reviews of the assessed hazards;
  - (b) prepare and periodically review, revise, test and implement an on-site emergency plan, based on the hazard assessment;
  - (c) ensure consistency of on-site emergency arrangements with those of off-site local and national authorities under the all-hazards approach, including those arrangements for response to nuclear security events;
  - (d) ensure consistency among relevant plans, inter alia the emergency plans and physical protection plans, and ensure that these plans are integrated;
  - (e) conduct subsequent analysis of an emergency, including analysis of the emergency response;
  - (f) ensure that appropriate and coordinated training and exercises programs are in place and implemented, and that training and exercises are systematically evaluated; and
  - (g) ensure effective communication with the public in preparedness for a nuclear or radiological emergency.

### **Article 7. Hazard Assessment**

The licensee shall perform the hazard assessment in relation to its facilities and activities, to determine the extent of preparedness and response arrangements for a nuclear or radiological emergency, based on a graded approach.

As part of the hazard assessment, the licensee shall conduct a comprehensive safety analysis to identify all sources of exposure and to assess the potential consequences of postulated emergencies on its personnel, the public and the environment, based on the identified hazards. The on-site arrangements for preparedness and response for a nuclear or radiological emergency shall be commensurate with the identified hazards and the magnitude of the potential consequences.

The licensee shall ensure that hazard assessment comprise the following events:

- (a) Events that could affect the facility or activity, including events of very low probability and events not considered in the design; Events involving a combination of a nuclear or radiological emergency with a conventional emergency;
- (b) Events that could affect several facilities and activities concurrently, as well as consideration of the interactions between the facilities and activities affected.

The licensee shall ensure that the hazard assessment includes consideration of the results of threat assessment made for nuclear security purposes, and shall identify on-site and off-site areas and locations, where any of the following is warranted:

- (a) Precautionary urgent protective actions as prescribed in Annex II of this regulation;
- (b) Urgent protective actions and other response actions as prescribed in Annex II of this regulation;
- (c) Early protective actions and other response actions, as prescribed in Annex II of this regulation;
- (d) Other emergency response actions, such as longer term medical actions, as prescribed in Annex II of this regulation, and emergency response actions aimed at enabling the termination of the emergency;
- (e) Protection of emergency workers, as prescribed in Annex III of this regulation.

The licensee shall ensure that the hazard assessment also identifies non-radiation related hazards that may impair the effectiveness of the response actions to be taken and make provisions for revision of emergency arrangements prior to any changes in the facility or activity that affect the existing hazard assessment; or when new information becomes available that provides insights into the adequacy of the existing arrangements.

### **Article 8. Development of protection strategies for a nuclear or radiological emergency**

At the preparedness stage, the licensee shall develop protection strategies for taking protective actions and other response actions effectively on the site or under his responsibility, based on the hazards identified and the potential consequences of a nuclear or radiological emergency.

The licensee shall ensure that its protective and other response actions are justified and optimized, at the preparedness stage and during the response to an emergency, with due account to radiation detriments and also to non-radiological consequences having impact on public health, the economy, society and the environment.

The licensee shall develop its protection strategies based on the following considerations:

- (a) Evaluation of the detriment associated with the occurrence of stochastic effects in individuals exposed to ionizing radiation, basing on the effective dose;
- (b) the occurrence of deterministic effects in individuals exposed to ionizing radiation shall be evaluated on the basis of the RBE-weighted absorbed dose to internal tissues or organs;
- (c) actions to be taken either individually or in combination, to avoid or to minimize severe deterministic effects and to reduce the risk of stochastic effects shall be in line with the reference level and generic criteria as prescribed in Annex II of this regulation;
- (d) Operational criteria, in terms of conditions on the site, emergency action levels (EALs) and operational intervention levels (OILs) for taking protective actions and other response actions shall be derived from the generic criteria given in Annex II of this regulation.

Arrangements shall be established in advance to revise these operational criteria, as appropriate, in the course of a nuclear or radiological emergency, with account taken of the prevailing conditions as they evolve and in line with the national EPR plan.

The licensee shall involve and consult interested parties, as appropriate, in the development of its protection strategies.

The licensee shall ensure that the on-site protection strategy is harmonized with the off-site protection strategy.

At the preparedness stage, the licensee shall provide the off-site local and national authorities with relevant information for the development of off-site protection strategies for a nuclear or radiological emergency.

#### **Article 9. Implementation of protection strategies**

- (a) The licensee shall ensure that its protection strategy is implemented safely and effectively in emergency response, including but not limited to:
- (b) take urgent protective actions and other response actions in accordance with Annex II of this regulation, in order to avoid or to minimize severe deterministic effects, if possible, on the basis of observed conditions and before any exposure occurs;
- (c) Take early protective actions and other response actions to reduce the risk of stochastic effects based on generic criteria provided in Annex II of this regulation;
- (d) Provide for registration, health screening and longer term medical follow-up, , based on generic criteria provided in Annex II of this regulation;
- (e) Take actions to protect emergency workers, based on guidance values provided in Annex III of this regulation;

- (f) Take actions to mitigate non-radiological consequences, based on generic criteria provided in Annex II of this regulation;
- (g) Assess the effectiveness of the actions taken and adjusting them as appropriate on the basis of prevailing conditions and available information;
- (h) Revising the protection strategy as necessary and its further implementation;
- (i) Discontinuing protective actions and other response actions when they are no longer justified.
- (j) The licensee shall make arrangements to assess the magnitude of hazards and the possible development of hazardous conditions, throughout a nuclear or radiological emergency in order to promptly identify, characterize or anticipate, as appropriate, new hazards or the extent of hazards and to revise the protection strategy.

### **CHAPTER III. FUNCTIONAL REQUIREMENTS**

#### **Article 10. Management of Operations in an Emergency Response**

The licensee shall ensure that arrangements are in place for managing the response to a nuclear or radiological emergency, in the following manner:

- (a) For facilities in category I, II and III, the licensee shall make arrangements for on-site emergency response to be promptly executed and managed without impairing the performance of the continuing operational safety and security functions, both at the facility and at any other facilities on the same site.
- (b) For facilities in category I, II and III, the licensee shall arrange for transition from normal operations to operations under emergency conditions on the site and ensure its effective execution. The personnel who will be on the site when an emergency occurs shall be allocated clear responsibilities for this transition.

The licensee shall have arrangements in place to coordinate and integrate its response with the response of off-site authorities to conventional emergencies and to nuclear security events, under a unified command and control structure managed by the local or national authorities. These arrangements shall take into consideration the fact that the initiator of the nuclear or radiological emergency may not be known early in the response.

For a site where several facilities in categories I and II are collocated, the licensee shall make adequate arrangements to manage the emergency response at all the facilities, if each of them is under emergency conditions simultaneously. This shall include arrangements to manage the deployment of and the protection of personnel responding on the site and off the site.

The licensee shall ensure that, as far as practicable, the physical protection and the security systems under his responsibility remain functional in a nuclear or radiological emergency.

The licensee shall clearly assign in advance, and promptly discharge in a nuclear or radiological emergency, the authority and responsibility for directing the on-site emergency response and for making decisions on emergency response actions to be taken within licensee's responsibility.

The licensee shall make arrangements for obtaining and assessing the information necessary for making decisions on the allocation of resources throughout a nuclear or radiological emergency.

For facilities in category I and II, the licensee shall make arrangements, in coordination with off-site authorities, for coordinating the emergency response between response organizations within the emergency planning zones and emergency planning distances.

**Article 11. Arrangements for the Identification and Notification of a Nuclear or Radiological Emergency**

The licensee shall put in place arrangements for the prompt identification and notification of a nuclear or radiological emergency, and for the activation of an emergency response.

The licensee shall establish an on-site notification point for exchange of information with the off-site local and national authorities in case of a nuclear or radiological emergency. The notification point shall be:

- (a) maintained in a state of continuous availability to send notification or request for support to the off-site officials; and
- (b) able to initiate immediate communication by suitable, reliable and diverse means with the off-site response organizations.

The licensee shall coordinate with off-site authorities to ensure that a local off-site notification point has been established and appointed to receive licensee's notification of an actual or potential nuclear or radiological emergency and to activate the off-site response and the external support to the on-site response of the licensee.

During the working hours, the licensee shall have a person on the site at all times with the following authority and responsibilities to:

- (a) promptly recognize and classify the emergency;
- (b) upon classification, to promptly declare the emergency class and to initiate the on-site response in accordance with the protection strategy and with the provisions of the on-site emergency plan;
- (c) to notify the local off-site public authorities, and provide sufficient information to activate the off-site response.

For facilities in category I and II, the licensee in coordination with off-site authorities shall ensure that the off-site notification point is able to initiate immediate communication with the authority that has been assigned the responsibility to decide on and to initiate protective actions off the site.

## **Article 12. Classification of nuclear and radiological emergencies**

The licensee shall use the emergency classification system provided in Annex IV of this regulation for the activation of the on-site and off-site response.

The licensee shall establish operational criteria for emergency classification which shall include EALs and other observable conditions and indicators of the conditions at the facility and on the site or off the site as well as in the vicinity of the facility. Detailed EALs shall be developed for each emergency class. The EALs shall be submitted for approval to the Regulatory Authority and afterwards included in the on-site emergency plan and in the operating procedures of the facility or activity.

The licensee shall ensure that any process or action not related to the emergency response, such as rating an event on the International Nuclear and Radiological Event Scale (INES), does not delay the emergency classification and the activation of the on-site response. Such classification shall be done in accordance with Annex V of this Regulation, and only for communication purposes related to the significance of nuclear or radiological events.

## **Article 13. Review of declared emergency**

As the emergency progresses, the licensee shall review the declared emergency class in light of any new information and to revise it as appropriate.

## **Article 14. Notification of emergency**

The licensee shall notify the local Authorities and the Regulatory Authority immediately after declaration of any of the emergency class specified in the licensee's emergency plan. The follow-up notifications to the local Authorities and the Regulatory Authority shall also be made immediately upon change in emergency class, plant or facility conditions, implementation of mitigatory actions, protective and other response actions.

The licensee shall promptly share information with the local Authorities and the Regulatory Authority, and other governmental organizations as necessary, for the assessment of the emergency situation, and in transnational emergency to meet the obligations of relevant international conventions when requested.

In the event of loss of a radioactive source or of loss of control over a radioactive source, the licensee shall remain liable for the recovery of the source. The notification form shall particularly include as a minimum the radionuclide, the activity, the identification number of the source, type and identification number of the source container and a detailed description of the relevant events leading to the loss or loss of control.

## **Article 15. Mitigatory Action**

The licensee shall promptly take actions on the site that are necessary to mitigate the consequences of a nuclear or radiological emergency involving a facility or an activity under its responsibility.

For facilities in category I, II and III or activities in category IV, the licensee shall put in place arrangements for mitigatory actions to:

- (a) Prevent escalation of an emergency;
- (b) Return the facility or radiation source to a safe and stable state; and
- (c) Reduce the potential, and to mitigate the consequences, of radioactive releases or exposures.

Such arrangements, shall take into account the following:

- (a) the operational actions necessary and information needed for the assessment of the situation;
- (b) the workload and conditions of the operating personnel;
- (c) the response actions necessary in the facility;
- (d) full range of possible conditions affecting the emergency response, including those resulting from conditions in the facility and those resulting from impacts of natural, human induced or other events and affecting infrastructure or affecting several locations simultaneously;
- (e) the continued operability of physical protection and nuclear security systems.

The arrangements shall include the development and enforcement of emergency operating procedures and guidance for operating personnel on mitigatory actions for severe conditions for a nuclear power plant, as part of the accident management program and for the full range of postulated emergencies for the facilities and/or activities under licensee's responsibilities.

**Article 16. Access to the facility**

The licensee shall assess and determine, at the preparedness stage, when and under what conditions assistance from off-site authorities is required on the site, consistent with the hazard assessment and the protection strategy.

In addition, the licensee shall ensure that arrangements are in place for receiving on the site technical expertise in radiation protection from off-site organizations.

**Article 17. On-site and off-site teams to support on-site response**

The licensee shall ensure that on-site teams for mitigating the consequences of an emergency are available and are prepared to perform response actions at the facility. The operating personnel and emergency workers directing mitigatory actions shall be provided with information and technical assistance to allow them to take actions effectively to mitigate the consequences of the emergency.

For facilities in category I, II and III, the licensee shall ensure that any equipment that is necessary for actions to be taken in response to a radiological emergency shall be placed at the most suitable location to ensure its availability at the time of need and to allow safe access to it under emergency conditions.

In case of an emergency, off-site emergency response teams shall be afforded prompt access to the facility premises, and shall be informed about on-site conditions and provided with instructions and

with means for protecting themselves as emergency workers while performing response actions on the site.

The licensee for activities in category IV shall make arrangements to:

- (a) Promptly inform the local authorities and the Regulatory Authority;
- (b) Coordinate with the local authorities and the regulatory Authority for on-call advice;
- (c) Dispatch of an emergency team at the scene of the incident which includes a radiological assessor or team capable of assessing the radiological hazards and conditions, and of advising on mitigatory actions, public protective and response actions, and on emergency workers protection;
- (d) Initiate a prompt search in the event of loss of a dangerous source.
- (e) Take all practicable and appropriate actions to locate and recover the radioactive source, and/or mitigate the consequences of the emergency;
- (f) Provide guidance and training to emergency workers and first responders in an emergency at an unforeseen location
- (g) Issue warnings to the public in the case when the dangerous source is lost or illicitly removed and possibly being in the public domain.

#### **Article 18. Urgent Protective and Other Response Actions**

The licensee shall assess emergency conditions, initially and throughout a nuclear or radiological emergency, and take urgent protective actions and other response actions effectively.

For facilities in category I, II and III, the licensee shall promptly assess the following:

- (a) Abnormal conditions at the facility;
- (b) Exposures and radioactive releases, and releases of other hazardous material;
- (c) Radiological conditions on the site and, as appropriate, off the site;
- (d) Any exposures or potential exposures of workers and emergency workers, the public and, as relevant, patients and helpers in an emergency

The licensee shall use the assessments in the above paragraph, for the following:

- (a) as a basis for emergency classification;
- (b) decide on mitigatory actions to be taken by the licensee;
- (c) decide on protective actions and other response actions to be taken on the site, for the protection of the operating personnel and emergency workers, the public and, as relevant, patients and helpers

- (d) formulate recommendations for urgent protective actions and other response actions to be taken off the site
- (e) identify those individuals who could potentially have been exposed on the site at levels requiring appropriate medical attention in accordance with Annex II of this regulation, where appropriate.

The licensee for activities in category IV shall make arrangements to assess promptly the extent and the significance of any abnormal conditions, exposures or contamination at locations where its activities are deployed. These assessments shall be used:

- (a) for initiating the mitigatory actions;
- (b) as a basis for protective actions and other response actions to be taken on the site or at the scene of the incident;
- (c) to identify members of the public who could potentially be exposed;
- (d) for determining the level for emergency response and for communicating the extent of hazards and the recommended protective actions and other response actions to the appropriate off-site response organizations.

#### **Article 19. Protection of human life**

The licensee in coordination with off-site authorities shall take actions to save human life or to prevent serious injury without any delay on the basis of possible presence of radioactive material. For an emergency at an unforeseen location, such actions must also include provision of information and guidance to the first responders on precautionary measures necessary to be taken while providing first aid or transporting possibly contaminated individuals.

The licensee shall put in place urgent protective actions and other response actions on the site, in order to prevent the occurrence of severe deterministic health effects and to avert doses to the extent practicable, in line with the on-site protection strategy.

Such actions shall be taken with due consideration of the uncertainties in, and limitations of, the information available when protective actions and other response actions have to be taken to be effective, and shall include the following:

The specification of off-site emergency planning zones and emergency planning distances for which arrangements shall be made at the preparedness stage for taking protective actions and other response actions effectively. These emergency planning zones and emergency planning distances shall include:

A PAZ, for facilities in category I, for which arrangements shall be made for taking urgent protective actions and other response actions, before any significant release of radioactive material occurs, on the basis of conditions at the facility such as conditions leading to the declaration of a general emergency, in order to avoid or to minimize severe deterministic effects;

An UPZ, for facilities in category I and II, for which arrangements shall be made to initiate urgent protective actions and other response actions, if possible before any significant release of radioactive material occurs, on the basis of conditions at the facility such as conditions leading to the declaration of a general emergency; and after a release occurs, on the basis of monitoring and assessment of the radiological situation off the site, in order to reduce the risk of stochastic effects. Any such actions shall be taken in such a way as not to delay the implementation of precautionary urgent protective actions and other response actions within the PAZ;

An EPD from the facility, for facilities in category I and II (beyond the UPZ), for which arrangements shall be made to conduct monitoring and assessment of the radiological situation off the site in order to identify areas, within a period of time that would allow the risk of stochastic effects in the areas to be effectively reduced by taking protective actions and other response actions within a day to a week or to a few weeks following a significant radioactive release; and

An ICPD from the facility, for facilities in category I and II (beyond the EPD), for which arrangements shall be made to take response actions; for protecting the food chain, water supply and commodities other than food from contamination; and for protecting the public from the ingestion of food, milk, drinking water and from the use of commodities other than foodstuff with possible contamination following a significant radioactive release.

Criteria, based on the emergency classification and on conditions at the facility and off the site, for initiating and for adjusting urgent protective actions and other response actions within the emergency planning zones and emergency planning distances, in accordance with the protection strategy;

Responsibility and authority to provide sufficient and updated information to the off-site notification point at any time to allow for an effective off-site emergency response; and

Estimation and periodic re-assessment of the time required to evacuate public from PAZ and UPZ, using updated population data and develop off-site protective action strategies in coordination with off-site authorities.

**Article 20. Emergency planning zones and distances and security perimeters for radiological emergencies**

The licensee, in coordination with off-site authorities, shall take appropriate protective actions and other response actions effectively within the emergency planning zones and emergency planning distances, not later than 6 hours upon the notification of an emergency, for facilities in category I and II. Such actions must be taken and coordinated within all emergency planning zones and distances, and shall include:

- (a) Prompt exercise of authority and discharge of responsibility for making decisions to initiate protective actions and other response actions;
- (b) Warning the permanent population, transient population groups and special population groups or those responsible for them and warning special facilities;
- (c) Taking urgent protective actions and other response actions;

- (d) Protection of emergency workers and helpers in an emergency; and
- (e) Provision of services necessary for ensuring public safety continuously throughout the emergency, including during the period when protective actions and other response actions are being taken.

The licensee shall ensure timely monitoring and assessment of contamination, radioactive releases and exposures within the emergency planning zones and emergency planning distances, in order to determine any necessary adjustment on the protective actions and other response actions that have to be taken or that are being taken. It must include the use of pre-established operational criteria in accordance with the protection strategy.

#### **Article 21. Safety of the persons present on the site**

The licensee shall make arrangements for protection and safety of all persons on the site in a nuclear or radiological emergency, for facilities in category I, II and III.

In case of an emergency, the licensee shall:

- (a) Notify all persons on the site in relation to the emergency which just occurred;
- (b) Take appropriate actions immediately upon notification of an emergency for all persons on the site;
- (c) Account for persons on the site and to locate and recover those persons unaccounted for;
- (d) Provide immediate first aid;
- (e) Take urgent protective actions.

The above arrangements shall also include provision of the following for all persons present in the facility and on the site:

- (a) Suitable assembly points, provided with continuous radiation monitoring;
- (b) Sufficient number of suitable escape routes;
- (c) Suitable and reliable alarm systems and other means for warning and instructing all persons present under the full range of emergency conditions.

The licensee shall provide suitable, reliable and diverse means of communication at all times, under the full range of emergency conditions, for use in taking protective actions and other response actions on the site and for communication with off-site authorities responsible for taking protective actions and other response actions.

#### **Article 22. Instructions and Warnings to the Public**

At the preparedness stage, the licensee shall establish arrangements to provide the general public with information on the risks posed by its facility or activity, on initial response and on immediate protective actions in case of nuclear or radiological emergency, through educational campaigns.

These arrangements shall be commensurate with the radiological risk perceived for the respective facility or activity and shall be established in cooperation with relevant off-site response organizations responsible for public information.

The licensee in coordination with off-site authorities shall provide the members of public and interested parties, who are affected or are potentially affected by a nuclear or radiological emergency, with information and advice that is necessary for their protection, to warn them promptly and to instruct them on actions to be taken. This information shall be periodically updated, in line with the development of the emergency conditions.

The licensee, in coordination with off-site authorities, shall ensure that arrangements are made to provide the permanent population, transient population groups and special population groups or those responsible for them and special facilities within the emergency planning zones and emergency planning distances, before operation and throughout the lifetime of the facility, with information on the response to a nuclear or radiological emergency, for facilities in category I and II. This information shall:

- (a) Include information on the potential for a nuclear or radiological emergency, on the nature of the hazards, on how people would be warned or notified, and on the actions to be taken in such an emergency;
- (b) Be provided in languages mainly spoken by the population residing within the emergency planning zones and emergency planning distances.

The licensee in coordination with off-site authorities shall ensure that arrangements are in place to locate people who may have been affected by a nuclear or radiological emergency and who may need response actions such as decontamination, medical examination or health screening. Such arrangements shall include as well measures for issuing warnings to the public and providing information in the event when a dangerous source is lost or found in the public domain.

The relevant arrangements for warning and providing instructions to the population in the affected area shall be included in the on-site emergency plan of the licensee, and relevant local arrangements.

### **Article 23. Protection of Emergency Workers and Helpers**

The licensee shall put in place arrangements for protection of its emergency personnel, and on-site emergency workers and helpers.

As part of these arrangements, the licensee shall designate its emergency personnel at the preparedness stage, allocate them roles and responsibilities, and ensure their health surveillance through initial and continuing fitness evaluation programmes.

The licensee shall ensure that emergency workers who were not designated as such in advance of an emergency, and helpers in an emergency, are registered and integrated into its emergency response operations.

**Article 24. Anticipated hazardous conditions and protection strategy for the emergency workers**

The licensee shall determine the anticipated hazardous conditions, both on and off the site, in which emergency workers might have to perform response functions in a nuclear or radiological emergency, in accordance with the results of the hazard assessment and the protection strategy.

The licensee shall ensure that all practicable means are used to minimize exposure of emergency workers and helpers in an emergency, and to optimize their protection.

The licensee shall ensure protection of on-site emergency workers and helpers in an emergency for the range of anticipated hazardous conditions in which they might have to perform response functions. The arrangements to be established at the preparedness stage shall include, as a minimum:

- (a) Training of emergency workers, who have been designated in advance, in relevant areas including radiation protection and safety;
- (b) Providing instructions to emergency workers, not designated in advance, and helpers in an emergency on how to perform the duties under emergency conditions immediately, before the conduct of their specified duties;
- (c) Managing, controlling and recording the doses received;
- (d) Provision of appropriate specialized protective equipment and personal monitoring equipment, and procedures for emergency response in the anticipated hazardous conditions;
- (e) Provision of iodine thyroid blocking, if exposure due to radioactive iodine is possible;
- (f) Obtaining consent from emergency workers to perform specified duties after informing them on associated risks;
- (g) Medical examination, longer term medical actions, and psychological counseling, as appropriate.

The licensee shall ensure that no emergency worker is subject to an exposure in an emergency that could give rise to an effective dose in excess of 50 mSv, other than:

- (a) For the purposes of saving human life or preventing serious injury;
- (b) When taking actions to prevent severe deterministic effects or actions to prevent the development of catastrophic conditions that could significantly affect people and the environment;
- (c) When taking actions to avert large collective doses

## **Article 25. Dose limit and medical attention for emergency workers and helpers**

The licensee shall ensure that helpers in an emergency shall not perform actions that could result in their receiving doses in excess of an effective dose of 50 mSv.

The licensee shall make arrangements to assess, as soon as practicable, the individual doses received by its emergency workers and helpers and, as appropriate, to restrict further exposures in the response to the emergency.

The licensee shall make arrangements for the provision of appropriate medical attention to its emergency workers and helpers in an emergency, for doses received in response to a nuclear or radiological emergency.

The licensee shall ensure that emergency workers who receive doses in a response to a nuclear or radiological emergency shall not be prohibited from incurring further occupational exposure. However, the licensee shall make arrangements for qualified medical advice to be obtained before any further occupational exposure occurs, if an emergency worker has received an effective dose exceeding 200 mSv.

The licensee shall provide information on the doses received in a response to a nuclear or radiological emergency and information on any consequent health risks, as soon as practicable, to emergency workers and to helpers in an emergency. The licensee shall maintain records of doses received by emergency workers, and provide them to the Regulatory Authority, if so required.

Once the emergency situation ended, workers undertaking recovery operations, such as repairs to the facility and buildings, waste disposal or decontamination of the site and surrounding area, shall be subject to the full system of detailed requirements for occupational exposure.

## **Article 26. Medical Response in a Nuclear or Radiological Emergency**

In case of an emergency, the licensee shall ensure to the extent possible that medical assistance is provided to its workers when needed in emergency situations.

At the preparedness stage, the licensee shall ensure that arrangements are in place for the provision of appropriate medical screening and triage, medical treatment and longer term medical actions for those people who could be affected in a nuclear or radiological emergency.

For facilities in category I, II and III, the licensee shall provide appropriate medical treatment of contaminated or overexposed in a nuclear or radiological emergency. Arrangements for medical response shall include measures for:

- (a) First aid to those affected;
- (b) Transport services for those injured, and/or contaminated, and/or overexposed while being on the site;
- (c) Management and treatment of contaminated or overexposed individuals at pre-designated facilities;

- (d) Estimation and reconstruction of doses;
- (e) Specialized medical treatment; and
- (f) Instructions to medical personnel on general self-protection measures when treating individuals with possible radioactive contamination.

For facilities in category I and II, the licensee in coordination with off-site authorities shall put in place arrangements for areas within emergency planning zones, for performing medical screening and triage and for assigning, to a pre-designated medical facility, any individual exposed at levels exceeding the criteria provided for in Annex II of this regulation, including the use of pre-established operational criteria in accordance with the protection strategy.

The licensee, as appropriate, in coordination with relevant off-site authorities shall ensure that arrangements are made for the long-term supervision of those emergency personnel who may be at risk to develop radiation stochastic effects in the future, due to performing their duties in emergency situation.

In emergency situations, the licensee shall keep clear evidence, and records with all workers who received first aid, specialized treatment and/or long term medical follow up.

For facilities in category I and II, the licensee in coordination with relevant off-site authorities shall ensure that medical personnel, both general practitioners and emergency medical staff are aware of the clinical symptoms of radiation exposure, and of the appropriate notification procedures and other emergency response actions to be taken in emergency planning zones and distances if a nuclear or radiological emergency arises or is suspected.

### **Article 27. Communicating with the Public throughout a Nuclear or Radiological Emergency**

In a nuclear or radiological emergency, the licensee shall:

- (a) provide useful, timely, factual, clear and appropriate information in plain and understandable language to the public and mass-media;
- (b) respond in a timely manner to enquiries received from the public, the Regulatory Authority, other local and national public authorities;
- (c) rate the nuclear or radiological event in accordance with the INES scale and provide necessary information to the Regulatory Authority for its subsequent rating
- (d) The information provided to the public shall be shared and coordinated with the Regulatory Authority and other local or national governmental authorities. The information delivered to the public shall include the type of emergency which has occurred, the extent and prognosed development, initial response and advice on health protection actions.

The licensee shall protect sensitive information in circumstances where a nuclear or radiological emergency is initiated by a nuclear security event.

At the preparedness stage, the licensee shall develop a communication strategy for emergency situations, and ensure that arrangements are in place for communication with the public in a nuclear

or radiological emergency. Adjustment shall be made to this strategy in the emergency response on the basis of prevailing conditions, with account taken of the possibility that the usual means of communication might be damaged in the emergency or by its initiating event such as earthquake or floods, or overburdened by demand for its use.

As part of the communication strategy, the licensee shall prepare to identify and address, to the extent practicable, misconceptions, rumors and incorrect and misleading information that might be circulating widely in a nuclear or radiological emergency, in particular those that might result in actions being taken beyond those emergency response actions that are warranted and recommended.

In order to effectively communicate with the public throughout a nuclear or radiological emergency, the licensee shall develop and implement a system for putting radiological health hazards in perspective, to address public concerns regarding potential health effects. In the development of such a system, due consideration shall be given to pregnant women and children as the individuals who are most vulnerable with regard to radiation exposure.

### **Article 28. Early Protective Actions and Other Response Actions**

At the preparedness stage, the licensee shall identify those early protective actions to be taken in a nuclear or radiological emergency on the site or in relation to its activities at various locations, such as radiation monitoring and decontamination actions.

For facilities in category I and II, the licensee in coordination with off-site authorities shall ensure that, within the EPD, arrangements are made for effective relocation that may be required following a significant radioactive release and for the prevention of inadvertent ingestion, in accordance with the protection strategy. Such arrangements shall include:

- (a) Provision of instructions and advice to prevent inadvertent ingestion;
- (b) Prompt monitoring and assessment;
- (c) Use of pre-established operational criteria in accordance with the protection strategy;
- (d) The means for accomplishing relocation and for assisting those persons who have been relocated; and
- (e) Provisions to extend monitoring and assessment and actions beyond the EPD if necessary.

For facilities in category I and II, the licensee in coordination with off-site authorities shall ensure that, for areas within the ICPD, arrangements are made for prompt protection in relation to, and for restriction of, non-essential local produce, forest products, milk from grazing animals, drinking water supplies, animal feed and commodities with contamination or possibly with contamination following a significant radioactive release, in accordance with the protection strategy. Such arrangements shall include:

- (a) Provision of instructions and advice to: protect the food chain, water supply and commodities from contamination; prevent ingestion of food, milk and drinking water with

contamination or possibly with contamination, and; prevent use of commodities with contamination or possibly with contamination;

- (b) Prompt monitoring, sampling and analysis;
- (c) Use of pre-established operational criteria in accordance with the protection strategy;
- (d) Means to enforce the restrictions; and
- (e) Provisions to expand monitoring and assessment and actions beyond this distance if necessary.

### **Article 29. Radiation monitoring in emergency conditions**

At the preparedness stage, the licensee shall make arrangements to promptly assist off-site response organizations by conducting environmental radiation monitoring within the areas affected by the emergency situation, and monitoring for contamination of vehicles, personnel and goods moving into and out the contaminated areas in order to control the spread of contamination.

These arrangements shall clearly specify the licensee's role and responsibilities and shall be based on the use of pre-established operational criteria prescribed in the off-site protection strategy.

The licensee shall ensure that monitoring in response to a nuclear or radiological emergency is carried out on the basis of a strategy, which is to be developed at the preparedness stage in line with the protection strategy. Adjustment to such monitoring in the emergency response shall be made on the basis of prevailing conditions.

The licensee in coordination with off-site authorities shall ensure that arrangements are made for access control and enforcing of restrictions for areas in which evacuations and/or relocations would be carried out within emergency planning zones, the EPD and the inner cordoned off area, in accordance with the protection strategy.

The licensee shall ensure that arrangements are made to evaluate methods of decontamination before their general use and to assess their effectiveness in terms of dose reduction.

### **Article 30. Assessment of exposure to the member of the public**

The licensee shall carry out assessment of exposure of members of the public in a nuclear or radiological emergency, and make the results of these assessments publicly available, as appropriate.

Such assessments shall be based on the best available information, and be put into perspective in terms of the associated health hazards and shall be promptly updated in light of information that would yield substantially more accurate results.

### **Article 31. Managing Radioactive Waste in an Emergency**

The licensee shall ensure that radioactive waste arising from a nuclear or radiological emergency is managed safely and effectively in accordance with laws and regulations in place.

The radioactive waste arising from the emergency situation shall be managed in a manner that does not compromise the protection strategy, with account taken of prevailing conditions as these evolve. At the preparedness stage, the licensee shall develop a radioactive waste management strategy for the radioactive waste that might arise from implementing protective actions and other response actions during the response to an emergency.

At the preparedness stage, the licensee shall make arrangements for the safe and effective management of radioactive waste resulted from an emergency. These arrangements shall include:

- (a) a plan to characterize waste, including in situ measurements and analysis of samples;
- (b) criteria for categorization of waste;
- (c) avoiding to the extent possible the mixing of waste of different categories;
- (d) minimizing the amount of material declared as radioactive waste;
- (e) method for determining appropriate options for storage, predisposal management and disposal;
- (f) a plan for the long term management of waste and
- (g) considerations of non-radiological aspects of waste

The recovered radioactive material/waste resulted from the emergency situation shall be transported for the purpose of temporary or final storage according to the national regulations applicable to transport of radioactive materials.

### **Article 32. Mitigating the Non-Radiological Consequences of a Nuclear or Radiological Emergency and of an Emergency Response**

The licensee in coordination with off-site authorities shall conduct actions to mitigate the non-radiological consequences of a nuclear or radiological emergency and of an emergency response for its emergency personnel, emergency workers, helpers, and the public.

The licensee shall give due consideration to non-radiological consequences of a nuclear or radiological emergency and of an emergency response when deciding on the protective actions and other response actions to be taken on the site.

At the preparedness stage, the licensee in coordination with the off-site authorities shall ensure that arrangements are made for mitigating the non-radiological consequences of an emergency and those of an emergency response and for responding to public concern in a nuclear or radiological emergency. These arrangements shall include measures for providing affected people with:

- (a) Information on any associated health hazards and clear instructions on any actions to be taken;
- (b) Medical and psychological counseling, as appropriate;
- (c) Adequate social support for personnel and dependents, as appropriate.

### **Article 33. International Assistance for Emergency Preparedness and Response**

The licensee shall ensure that a financial insurance in case of emergency is acquired to ensure adequate financial arrangements are in place when requesting and receiving international assistance for emergency response for a nuclear or radiological emergency.

### **Article 34. Terminating a Nuclear or Radiological Emergency**

At the preparedness stage, the licensee shall establish provisions and criteria to discontinue the implemented on-site protective actions and other response actions when further assessment shows that they are no longer justified. The planning process shall include, as appropriate:

- (a) Means for assessing radiological and non-radiological consequences;
- (b) Conditions, criteria and objectives to be met for enabling the termination of a nuclear or radiological emergency;
- (c) A review of the hazard assessment and of the emergency arrangements;
- (d) Establishment of guidelines and procedures for the termination of an emergency;
- (e) Arrangements for continued communication with the public, and for monitoring of public opinion and the reaction in the news media;
- (f) Arrangements for consultation of interested parties.

For all his facilities and activities, the licensee shall recommend the termination of the emergency exposure situation and the transition to an existing exposure situation, based on comprehensive analysis of facility/activity status and the use of criteria mentioned above.

The licensee shall submit the justification and the results of the analysis for termination of the emergency to the Regulatory Body for approval.

The Licensee shall provide any necessary input for off-site decision making on lifting restrictions and other arrangements imposed during the response phase of a nuclear or radiological emergency.

The licensee in coordination with off-site authorities shall ensure that adjustment of protective actions and other response actions and of other arrangements that are aimed at enabling the termination of an emergency are made by a formal process that includes consultation of interested parties, as appropriate. Both radiological and non-radiological consequences shall be considered in deciding on the termination of an emergency, as well as in the justification and optimization of protection strategy as necessary.

The arrangements for termination of a nuclear or radiological emergency shall take into account the fact that the termination of an emergency might be at different times in different geographical areas. The planning process shall include, as appropriate:

- (a) The roles and functions of organizations;
- (b) Methods of transferring information;
- (c) Means for assessing radiological and non-radiological consequences;

- (d) Conditions, criteria and objectives to be met for enabling the termination of a nuclear or radiological emergency;
- (e) A review of the hazard assessment and of the emergency arrangements;
- (f) Establishment of guidelines and procedures for the termination of an emergency;
- (g) Arrangements for continued communication with the public, and for monitoring of public opinion and the reaction in the news media; and
- (h) Arrangements for consultation of interested parties.

**Article 35. Communication of the termination of the emergency to members of the public**

The licensee in coordination with off-site authorities shall ensure that arrangements are in place for communication with the public in a nuclear or radiological emergency which include arrangements for communication on the reasons for any adjustment of protective actions and other response actions and other arrangements aimed at enabling the termination of the emergency.

This shall include providing the public with information on the need for any continuing protective actions following termination of the emergency. Arrangements shall be made, during this period, to closely monitor public opinion and the reaction in the news media in order to ensure that any concerns can be promptly addressed. These arrangements shall ensure that any information provided to the public puts health hazards in perspective.

**Article 36. Transition from emergency exposure situation to an existing exposure situation**

The licensee shall ensure that transition from an emergency exposure situation to an existing exposure situation or to a planned exposure situation is made in a coordinated and orderly manner, by making any necessary transfer of responsibilities within the organization.

The licensee shall ensure that once the emergency is terminated, all the workers on the site shall be subject to the relevant requirements for occupational exposure in planned exposure situations or existing exposure situation as prescribed in the radiation protection law.

**Article 37. Analysis of the Nuclear or Radiological Emergency and the Emergency Response**

The licensee shall:

- a) document, protect and preserve, in an emergency response, to the extent practicable, data and information important for analysis of the nuclear or radiological emergency and the emergency response;
- b) ensure that the nuclear or radiological emergency and the emergency response are analyzed after the termination of the emergency, in order to identify actions to be taken to avoid other emergencies and to improve emergency arrangements.

After the emergency is terminated, the licensee shall undertake a timely and comprehensive analysis of the nuclear or radiological emergency and the emergency response with the involvement of interested parties, as appropriate. The analysis shall give due consideration to:

- (a) Reconstruction of the circumstances of the emergency;
- (b) Root causes of the emergency;

- (c) General implications for safety including the possible involvement of other sources;
- (d) General implications for security, as appropriate; and
- (e) Necessary improvements to emergency arrangements.

The licensee shall conduct comprehensive interviews on the circumstances of the nuclear or radiological emergency with those involved in the on-site emergency response. Whenever appropriate, the licensee will coordinate its analysis with the actions of the off-site authorities.

Whenever appropriate, the licensee in coordination with relevant off-site authorities shall make acquire the international expertise to conduct an independent analysis of the circumstances of the nuclear or radiological emergency.

#### **CHAPTER IV. INFRASTRUCTURAL REQUIREMENTS FOR EMERGENCY PREPAREDNESS AND RESPONSE**

##### **Article 38. Authorities and Responsibilities**

The licensee shall ensure that authorities for preparedness and response for a nuclear or radiological emergency are clearly established and responsibilities for making decisions on the site are assigned. A single position on-site shall have the authority and responsibility to direct and coordinate the response actions at a moment.

The licensee shall ensure that responsibilities are assigned at the preparedness stage for the critical response functions:

- (a) classification, declaration, and notification of the emergency;
- (b) activation of the emergency response;
- (c) Management of the on-site emergency response;
- (d) taking mitigatory actions;
- (e) protecting emergency workers;
- (f) taking protective actions and other response actions on the site;

coordination with off-site authorities and for the prevention and resolution of conflicts, if arise, the licensee shall ensure that the personnel assigned with critical response functions shall not be assigned any other responsibilities during the response to an emergency that would interfere with their specified functions.

The licensee shall ensure that the involvement of off-site response organizations in the performance of the functions as specified in this regulation is documented as part of the on-site emergency plan.

The licensee shall ensure that arrangements for delegation and transfer of authority are specified in the on-site emergency plan, together with arrangements for notifying all concerned on and off the site.

### **Article 39. Organization and Staffing**

The licensee shall:

- (a) ensure that on-site organization for response to a nuclear or radiological emergency is established at the preparedness stage, and staffed with sufficient and qualified personnel;
- (b) ensure that appropriate number of suitably qualified personnel are available at all times, as necessary, following the declaration and notification of a nuclear or radiological emergency, for taking mitigatory actions, protective actions and other response actions, as necessary;
- (c) ensure that emergency response personnel are assessed for their initial fitness and continuing fitness for their intended duties;
- (d) establish organizational relationships and interfaces for preparedness and response for a nuclear or radiological emergency with off-site authorities;

For a site where multiple facilities in category I, II and III are collocated, the licensee shall ensure that an appropriate number of suitably qualified personnel are available to manage an emergency response at all facilities, if each of the facilities is under emergency conditions simultaneously.

### **Article 40. Coordination of emergency preparedness and response**

The licensee shall ensure that arrangements and protocols for operational interfaces are in place, as appropriate, for the coordination of emergency preparedness and response with off-site authorities. The arrangements shall be clearly documented and be made available to all relevant parties. Arrangements shall be put in place to ensure effective working relationship among these organizations, both at the preparedness stage and in an emergency.

### **Article 41. Plans and Procedures for Emergency Response**

At the preparedness stage, the licensee shall prepare and subsequently review, revise, test and implement an emergency plan, in line with the requirements of this regulation.

The emergency plan shall specify the responsibilities for managing operations in an emergency response, and shall describe all the arrangements put in place for preparedness and response for a nuclear or radiological emergency, in line with the hazard assessment of the licensee.

The on-site emergency plan shall include the following as appropriate:

- (a) description of the on-site organization used to perform the specified functions, including the designation of persons for directing on-site activities and for ensuring liaison with off-site organizations;
- (b) the conditions under which an emergency shall be declared, including the criteria for emergency classification, a list of job titles and/or functions of persons empowered to declare

it, and a description of suitable arrangements for alerting the response personnel and public authorities;

- (c) the arrangements for initial and subsequent assessment of the conditions at the facility and radiological conditions on and off the site;
- (d) the arrangements for minimizing the exposure of persons on the site to ionizing radiation and for ensuring medical treatment of casualties, including arrangements to take protective actions if warranted on the basis of conditions at the facility to reduce the risk of severe deterministic health effects;
- (e) assessment of the status of the facility and the actions to be taken on the site to limit the extent of any radioactive release;
- (f) the chain of command and communication, including a description of related facilities and procedures;
- (g) an inventory of the emergency equipment to be kept in readiness at specified locations;
- (h) the actions to be taken by each position in the emergency response organization;
- (i) measures to be taken for declaring the termination of an emergency;
- (j) description of all activities needed to maintain emergency preparedness, including arrangements with local authority as appropriate.

The licensee shall use the outline and the additional indications prescribed in Annex VII of this regulation when developing its on-site emergency plan.

During the development process, the licensee shall ensure that the on-site emergency plan is coordinated with the on-site security plan, and with any other plans of relevant off-site response organizations, in order to ensure that the simultaneous implementation of the plans would not reduce their effectiveness or cause conflicts.

After elaboration or revision, the on-site emergency plan shall be submitted to the Regulatory Authority for verification and approval.

The on-site plan shall be reviewed and updated periodically at least once in every five (5) years taking into account any change in the assessed hazards, experience and lessons learnt from research, operation, emergency response and exercises, technological developments and experience feedback.

However, the Regulatory Authority reserves the right to request for review or update anytime sooner when deemed necessary.

The licensee shall:

- a) Ensure that an off-site emergency plan is developed that integrates all relevant plans for emergency response in a coordinated manner and is consistent with all-hazards approach for facilities in category I and II, in coordination with off-site authorities;

- b) Ensure that the on-site or facility emergency plan is integrated and coordinated with other plans and procedures that may be implemented in a nuclear or radiological emergency, to ensure that the simultaneous implementation of the plans would not reduce their effectiveness or cause conflicts. Such other plans and procedures shall include, but not limited to:
  - (a) Physical protection program;
  - (b) Procedure for investigation of a nuclear security event;
  - (c) Evacuation plan; and
  - (d) Firefighting plan, etc.
- c) Ensure that the necessary implementing procedures and analytical tools are in place for an effective emergency response, in line with the provisions of the on-site emergency plan. Procedures and analytical tools shall be tested under simulated emergency conditions and shall be validated prior to initial use. Any arrangements for the use of analytical tools early in an emergency response for supporting decision making on protective actions and other response actions shall be made in due recognition of the limitations of such analytical tools and in a way that would not reduce the effectiveness of response actions. These limitations shall be made clear to, and shall be recognized by, those responsible for decision making.

#### **Article 42. Logistical Support and Facilities for Emergency Response**

The licensee shall ensure that adequate logistical support such as tools, instruments, supplies, equipment, communication systems, facilities and documentation, procedures, checklists, manuals, telephone numbers, email addresses, are in place for performing the response functions specified in this regulation.

For performing the response functions that are under his responsibilities, the licensee shall establish its own emergency response Centre. However, for the establishment or designation of facilities or locations which are not under its direct responsibilities, the licensee shall cooperate and coordinate with the regulatory body and other relevant off-site public authorities.

For facilities in categories I and II, the licensee shall ensure that as a contingency measure, alternative supplies, such as water and electrical power for taking on-site mitigatory actions, including any necessary equipment are in place;

For facilities in category I and II, the licensee in coordination with off-site authorities shall ensure that arrangements are in place for performing appropriate and reliable analyses of samples including environmental, biological, and measurements of internal contamination for the purposes of emergency response and health screening, as appropriate. Such arrangements shall include the designation of laboratories that would be operational under postulated emergency conditions.

#### **Article 43. Emergency Response Centre**

The licensee shall design and implement its emergency response Centre to be commensurate with the radiological risk perceived for the facilities and/or activities under its operation.

Once established, the on-site emergency response Centre shall be interconnected with all relevant emergency response facilities of off-site response organizations for information exchange during emergency situations.

For facilities in category I and II, the licensee shall establish an on-site Emergency Control Center (ECC), which is responsible for sending emergency notifications of an actual or potential nuclear or radiological emergency. The ECC shall be made continuously available to send or receive any notification or request for assistance and to respond promptly or to initiate an off-site response.

For facilities in category I, the licensee shall make arrangements for availability of information about important facility parameters, including meteorological data and radiological conditions in the facility and its immediate surroundings, in the ECC and shall make arrangements for their availability and online transmission to the Authority. The licensee shall make arrangements for the installation of fixed radiation monitoring equipment with high level of detection capabilities in pre-selected on-site and off-site locations for rapid assessment of an emergency situation and to take protective and other response actions in a timely manner.

The ECC shall have means of communication with the main control room, emergency control room and other important points in the facility, and with the on-site and off-site emergency response organizations so that:

- (a) Technical support is provided to the operating personnel in the control room during emergency (from a technical support centre);
- (b) Operational control by personnel performing tasks at or near the facility can be maintained (from an operational support centre); and
- (c) The on-site emergency response is managed.

#### **Article 44. Notification Point**

The licensee shall establish a notification point, which is responsible for sending emergency notifications of an actual or potential nuclear or radiological emergency. The notification point shall be made continuously available to send or receive any notification or request for assistance and to respond promptly or to initiate an off-site response.

The licensee shall decide and implement the best option in terms of resources and effectiveness, when establishing the on-site Notification Point as separate location or integrated into the licensee's Emergency Response Centre.

The licensee shall make arrangements to obtain appropriate support from off-site authorities for logistics, communication, social welfare and other relevant areas.

#### **Article 45. Training, Drills and Exercises for Emergency Preparedness and Response**

The licensee shall ensure that his/her emergency response personnel can perform their assigned response functions effectively in a nuclear or radiological emergency.

In doing so, the licensee shall:

- a) identify the knowledge, skills and abilities necessary to perform response functions, in line with the provisions of this regulation;
- b) make arrangements for the selection and training of personnel in such way to ensure that the personnel have the requisite knowledge, skills, and abilities to perform their assigned response functions;
- c) make arrangements for initial and annual refresher training and drills programs for the positions with responsibilities for emergency response, and ensure that the personnel assigned to these positions undergo the relevant training;
- d) make arrangements to ensure that all the persons on the site are instructed about their actions to be taken after the declaration of a nuclear or radiological emergency;
- e) develop and implement annual on-site exercise programs in order to test the existing on-site emergency plan, arrangements, interfaces with off-site authorities, infrastructure and personnel knowledge and skills, needed for performing the response functions.

The licensee shall ensure that its management staff, who are responsible for making decisions on on-site response actions and communication with the public, are trained and shall regularly participate in exercises.

The licensee shall coordinate with off-site authorities its training and exercise programs, to ensure that both on-site and off-site response personnel are trained for performing their assigned tasks and functions in a nuclear or radiological emergency.

The licensee shall ensure, as appropriate, participation of all the off-site authorities, representatives of news media and people who would be potentially affected in some of the exercises.

Develop and implement exercise program as part of emergency plan to ensure that all specified functions required to be performed for emergency response and interfaces with off-site authorities are tested. The exercise program shall be developed by considering the following:

For facilities in category I and II, on-site emergency exercise shall be conducted annually and integrated emergency exercise shall be conducted biennially. In case of collocated category I and II facilities, each licensee shall participate in conduct of on-site, off-site and integrated emergency exercise once in every three (3) years;

For facilities in category III and activities in category IV, The on-site emergency exercise shall be conducted annually to test the emergency arrangements at the facility and in performance of an activity.

Training and exercise programs shall be submitted annually to the Regulatory Authority for approval.

The licensee shall review and revise training and exercise programs in light of experience gained and feedback received from conduct of previous training and emergency exercises, and/or from the response to real emergencies.

Exercises shall be conducted in different seasons and timings to check the continuous availability of resources both on and off the site and implementation of response and protective measures based on possible accident scenarios including natural disasters and nuclear security events. Exercise

scenarios and details shall be submitted to the Regulatory Authority at least thirty (30) days before the conduct of exercise for review and approval.

For category I and II facilities, an unannounced emergency exercise shall be conducted at least once in every five (5) years. For some of the unannounced emergency exercises, the exercise scenario may be provided by the Authority to assess the licensee response arrangements.

The licensee shall ensure that communication arrangements are being tested with all off-site authorities and with the Regulatory Authority regularly, at pre-defined time intervals.

#### **Article 46. Quality Management Programme**

The licensee shall establish a quality management programme for all preparedness and response activities as part of its integrated management system, to ensure a high degree of availability and reliability of all supplies, equipment, communication systems, plans, procedures, and arrangements necessary to perform its response functions in a nuclear or radiological emergency.

The quality management program shall include arrangements to periodically:

- (a) conduct inventories, re-supply, tests and calibrations, to ensure that these items are continuously available and are functional for use in a nuclear or radiological emergency;
- (b) maintain, review and update the on-site emergency plans, procedures and to incorporate lessons learned from research, operating experience, emergency drills and exercises;
- (c) establish and maintain adequate records in relation to both emergency arrangements and the response to a nuclear or radiological emergency, to include actions conducted, dose assessments, results of monitoring, and inventory of radioactive waste generated;
- (d) establish and maintain records of those personnel requiring longer-term medical actions.

The licensee shall ensure that independent appraisals of its emergency preparedness and response arrangements are conducted from time to time, and that the results of these are transposed into improved preparedness and response arrangements.

## **CHAPTER V. ADMINISTRATIVE FAULTS AND PENALTIES**

### **Article 47. Delay to notify a nuclear or radiological emergency**

Any licensee, who does not notify the Regulatory Authority in case of an emergency, commits a fault and is liable to an administrative fine of two hundred thousand Rwanda Francs (200,000Frw).

### **Article 48. Failure to notify the Regulatory Authority in case of emergency**

Any licensee, who does not notify the Regulatory Authority in case of an emergency, commits a fault and is liable to an administrative fine of three hundred thousand Rwanda Francs (300,000Frw).

### **Article 49. Failure to timely activate the Emergency response in case of emergency**

Any licensee who fails to timely activate the emergency response in case of emergency, commits a fault and is liable to an administrative fine of five hundred thousand Rwanda Francs (500,000Frw).

### **Article 50. Failure to conduct an audit after an Emergency**

Any licensee, who does not conduct an audit after an emergency, commits a fault and is liable to an administrative fine of two hundred thousand Rwanda Francs (200,000Frw).

### **Article 51. Failure to provide a report to the Regulatory Authority after an Emergency**

Any licensee, who does not provide a report to the Regulatory Authority after an emergency, commits a fault and is liable to an administrative fine of two hundred thousand Rwanda Francs (200,000Frw).

## **CHAPTER VI: FINAL PROVISIONS**

### **Article 52: Repealing provision**

All other prior regulatory provisions contrary to this regulation are hereby repealed.

### **Article 53: Commencement**

This regulation shall come into force on the date of signature by the Chairperson of the Regulatory Board.

**Done at Kigali on, 16/11/2021**

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**Dr Ignace GATARE**

**Chairperson of the Regulatory Board**

## **Annex I. Emergency Preparedness Categories**

### **Category Description**

- I.** Facilities, such as nuclear power plants, for which on-site events including those not considered in the design are postulated that could give rise to severe deterministic effects off the site that would warrant precautionary urgent protective actions, urgent protective actions or early protective actions, and other response actions to achieve the goals of emergency response, or for which such events have occurred in similar facilities.
- II.** Facilities, such as some types of research reactors, for which on-site events are postulated that could give rise to doses to people off the site that, would warrant urgent protective actions or early protective actions and other response actions to achieve the goals of emergency response, or for which such events have occurred in similar facilities. Category II (as opposed to category I) does not include facilities for which on-site events including those not considered in the design are postulated that could give rise to severe deterministic effects off the site, or for which such events have occurred in similar facilities.
- III.** Facilities, such as industrial irradiation facilities or some hospitals, for which on-site events are postulated that could warrant protective actions and other response actions on the site to achieve the goals of emergency response, or for which such events have occurred in similar facilities. Category III (as opposed to category II) does not include facilities for which events are postulated that could warrant urgent protective actions or early protective actions off the site, or for which such events have occurred in similar facilities.
- IV.** Activities and acts that could give rise to a nuclear or radiological emergency that could warrant protective actions and other response actions to achieve the goals of emergency response in an unforeseen location. These activities and acts include:
  - (a) transport of nuclear or radioactive material and other authorized activities involving mobile dangerous sources such as industrial radiography sources, nuclear powered satellites or radioisotope thermoelectric generators; and
  - (b) theft of a dangerous source and use of a radiological dispersal device or radiological exposure device.This category also includes:
  - (i) detection of elevated radiation levels of unknown origin or of commodities with contamination;
  - (ii) identification of clinical symptoms due to exposure to radiation; and
  - (iii) a transnational emergency that is not in category V arising from a nuclear or radiological emergency in another State.
- V** Areas within emergency planning zones and emergency planning distances in Rwanda for a facility in category I or II located in a neighboring country.

## **Annex II. Generic Criteria for Use in Emergency Preparedness and Response**

This Annex provides generic criteria:

- (a) For doses for which protective actions and other response actions are expected to be undertaken under any circumstances in a nuclear or radiological emergency to avoid or to minimize severe deterministic effects;
- (b) For doses for which protective actions and other response actions are expected to be taken, if they can be taken safely, in a nuclear or radiological emergency to reasonably reduce the risk of stochastic effects;
- (c) For doses for which restriction of international trade is warranted in a nuclear or radiological emergency, with due consideration of non-radiological consequences; and
- (d) For doses for use as a target dose for the transition to an existing exposure situation.

The generic criteria prescribed here are derived from a reference level of 100mSv residual dose per year.

This Annex includes examples of associated protective actions and other response actions. These generic criteria and associated protective actions and other response actions shall be taken into account in the development of the protection strategy, including generic criteria.

If protective actions in the context of the protection strategy are to be taken when doses are below the generic criteria given in this Annex, careful consideration is necessary to ensure that such actions are justified (i.e. that they do more good than harm) and that they are optimized in accordance with the protection strategy.

Table 1 provides generic criteria for doses received within a short period of time for which protective actions and other response actions are expected to be taken under any circumstances in a nuclear or radiological emergency to avoid or to minimize severe deterministic effects.

Table 1 provides generic criteria for  $AD_{\text{fetus}}$  as 0.1Gy. There would be only a very small probability of severe deterministic effects to the fetus at this dose and only during certain periods post-conception (e.g. between eight (8) and fifteen (15) weeks of in utero development), and only if the dose is received at high dose rates. During other periods post-conception and for lower dose rates, the fetus is less sensitive. There is a high probability of severe deterministic effects at 1Gy. Therefore, 1Gy is used as the generic criterion for doses to the fetus received within a short period of time for:

Making arrangements for applying decisions on urgent protective actions and other response actions to be taken off the site to avoid or to minimize the occurrence of severe deterministic effects (e.g. establishing a PAZ).

- a. Hazard assessment, to identify facilities and activities, on-site areas, off-site areas and locations for which a nuclear or radiological emergency could warrant precautionary urgent protective actions to avoid or to minimize severe deterministic effects;
- b. Identifying situations in which exposure is dangerous to health; and

**Table 1. Generic Criteria for Doses to Avoid or to Minimize Severe Deterministic Effects Acute External Exposure (<10 h)**

AD <sub>red marrow</sub> <sup>a</sup>	1 Gy	If the dose is projected: <ul style="list-style-type: none"> <li>• Take precautionary urgent protective actions immediately (even under difficult conditions) to keep doses below the generic criteria;</li> <li>• Provide public information and warnings;</li> <li>• Carry out urgent decontamination.</li> </ul>
AD <sub>fetus</sub>	0.1 Gy	
AD <sub>tissue</sub> <sup>b</sup>	25 Gy at 0.5 cm	
AD <sub>skin</sub> <sup>c</sup>	10 Gy to 100 cm <sup>2</sup>	

<sup>a</sup> AD represents the average RBE weighted absorbed dose to internal tissues or organs (e.g. red marrow, lung, small intestine, gonads, and thyroid) and to the lens of the eye from exposure in a uniform field of strongly penetrating radiation.

<sup>b</sup> Dose delivered to 100 cm<sup>2</sup> at a depth of 0.5 cm under the body surface in tissue due to close contact with a radioactive source.

<sup>c</sup> The dose is to 100 cm<sup>2</sup> dermis (skin structures at a depth of 40 mg/cm<sup>2</sup> (or 0.4 mm) below the surface).

**Table 2. Acute Internal Exposure due to an Acute Intake ( $\Delta = 30$  d<sup>d</sup>)**

AD( $\Delta$ )red marrow	0.2 Gy for radionuclide with atomic number $Z \geq 90$ 2 Gy for radionuclide with atomic number $Z \leq 89$	If the dose has been received: <ul style="list-style-type: none"> <li>• Perform immediate medical examination, medical consultation and indicated medical treatment;</li> <li>• Carry out contamination control;</li> <li>• Carry out immediate decorporation (if applicable);</li> <li>• Conduct registration for longer term medical follow-up; and</li> <li>• Provide comprehensive psychological counseling.</li> </ul>
AD( $\Delta$ )thyroid	2 Gy	
AD( $\Delta$ )lung	30 Gy	
AD( $\Delta$ )colon	20 Gy	
AD( $\Delta^f$ )fetus	0.1 Gy	

**Table 3. Generic Criteria for Protective Actions and Other Response Actions to Reduce the Risk of Stochastic Effects**

Generic Criteria		Protective Actions and Other Response Actions
Projected dose that exceeds the following generic criteria		Take following urgent protective actions and other response actions
H thyroid	50 mSv <sup>g</sup> in the first seven (7) days	Iodine thyroid blocking <sup>h</sup>
E	100 mSv in the first seven (7) days	Sheltering <sup>i</sup> ; evacuation; prevention of inadvertent ingestion; restrictions on food, milk and drinking water <sup>j</sup> and restrictions on the food chain and water supply; restrictions on commodities other than food; contamination control; decontamination; registration; reassurance of the public
H <sub>fetus</sub> <sup>k</sup>	100 mSv in the first seven (7) days	
Projected dose that exceeds the following generic criteria		Take following early protective actions and other response actions

<sup>d</sup>  $AD(\Delta)$  is the RBE weighted absorbed dose delivered over a period of time by the intake that will result in a severe deterministic effect in 5% of exposed individuals.

<sup>e</sup> Decorporation is the action of the biological processes, facilitated by chemical or biological agents, by means of which incorporated radionuclides are removed from the human body. The generic criterion for decorporation is based on the projected dose without decorporation.

<sup>f</sup> For this particular case, ‘ $\Delta$ ’ refers to the period of in utero development of the embryo and fetus.

<sup>g</sup> The equivalent dose to the thyroid ( $H_{\text{thyroid}}$ ) only due to exposure to radioiodine.

<sup>h</sup> This generic criterion applies only for administration of iodine thyroid blocking. For the thyroid, iodine thyroid blocking is an urgent protective action that is prescribed:

- (a) If exposure due to radioactive iodine is involved;
- (b) Before or shortly after a release of radioactive iodine,; and
- (c) Within only a short period before or after the intake of radioactive iodine.

<sup>i</sup> As a less disruptive protective action, sheltering may be ordered at lower doses as long as justified and optimized.

<sup>j</sup> Restrictions on food, milk and drinking water using these generic criteria are to be applied before sampling and analysis of food, milk and drinking water are carried out. Such restrictions apply as long as replacements of food, milk and drinking water or other alternatives are available to ensure they would not result in severe malnutrition, dehydration or other severe health impacts.

<sup>k</sup>  $H_{\text{fetus}}$  is the equivalent dose to the fetus, derived as the sum of the dose from external exposure and the maximum committed equivalent dose to any organ of the embryo or fetus from intake to the embryo or fetus for different chemical compounds and different times relative to conception.

E	100 mSv in the first year	Temporary relocation; prevention of inadvertent ingestion; restrictions on food, milk and drinking water and restrictions on the food chain and water supply; restrictions on commodities other than food; contamination control; decontamination; registration; reassurance of the public
$H_{\text{fetus}}^m$	100 mSv for the full period of in utero development	
Dose that has been received and that exceeds the following generic criteria		Take following longer term medical actions to detect and to effectively treat radiation induced health effects
E	100 mSv in a month	Health screening based on equivalent doses to specific radiosensitive organs (as a basis for longer term medical follow-up) <sup>1</sup> , registration, counseling
$H_{\text{fetus}}$	100 mSv for the full period of in utero development	Counseling to allow informed decisions to be made in individual circumstances

Table 3 provides generic criteria for taking protective actions and other response actions to reduce the risk of stochastic effects from the ingestion of food, milk and drinking water and from the use of other commodities in a nuclear or radiological emergency.

A value of 1/10 of the generic criteria given in Table 2 for early protective actions and other response actions is established as generic criteria for restrictions on food, milk and drinking water and on other commodities to ensure that the dose via all exposure pathways, including ingestion, will not exceed the generic criteria given in Table 2 for early protective actions and other response actions.

If restrictions on food, milk or drinking water would result in severe malnutrition or dehydration because replacements are not available, food, milk or drinking water with concentration levels of radionuclide that are projected to result in doses above the generic criteria given in Table 3 may be consumed until replacements are available provided that this would not result in doses from all exposure pathways above the generic criteria given in Table 2; otherwise, the people affected may be relocated.

**Table 4. Generic Criteria for Food, Milk and Drinking Water and Other Commodities to Reduce the Risk of Stochastic Effects**

Generic Criteria		Protective Actions and Other Response Actions
Projected dose from ingestion of food, milk and drinking water and from the use of other commodities that exceeds the following generic criteria:		Take following protective actions and other response Actions
E	10 mSv in the first year	Restrict consumption, distribution and sale of non-essential <sup>m</sup> food, milk and drinking water and restrict the use and distribution of other commodities. Replace essential food, milk and drinking water as soon as possible or relocate the people affected if replacements are not available. Estimate the doses of those who might have consumed food, milk and drinking water or used other commodities to determine whether this may have resulted in doses warranting medical attention in accordance with Table 2.
H fetus	10 mSv for the full period of in utero development	

Table 4 provides generic criteria for taking protective actions and other response actions to reduce the risk of stochastic effects arising from the use of vehicles, equipment and other items from an area affected by a nuclear or radiological emergency.

A value of 1/10 of the generic criteria given in Table 2 for early protective actions and other response actions is established as generic criteria for vehicles, equipment and other items from an affected area, to ensure that the dose via all exposure pathways, including the use of such vehicles, equipment and other items, would not exceed the generic criteria given in Table 2 for early actions for a member of the public.

Restricting the use of vehicles, equipment and other items from an affected area could interfere with taking urgent protective actions and other response actions or with providing services essential to public health or well-being (e.g. restricting the use of vehicles for transferring individuals requiring critical medical treatment or preventing a ship or an aircraft that has left an affected area from reaching its final destination). Such vehicles, equipment and other items whose use would give rise to a projected dose to their users above the generic criteria given in Table 4 may be used until replacements are available, provided that:

- (a) Their use will not result in doses from all exposure pathways that exceed the generic criteria given in Table 2 for members of the public or the guidance values given in Annex III for restricting the exposure of emergency workers, or the restriction set for exposures of helpers in an emergency in this regulation; and
- (b) Actions are taken to manage and control the exposure of the user as an emergency worker, a helper in an emergency or a member of the public, as appropriate.

**Table 5. Generic Criteria for Vehicles, Equipment and Other Items to Reduce the Risk of Stochastic Effects**

Generic Criteria		Protective Actions and Other Response Actions
Projected dose from the use of vehicles, equipment or other items from an affected area that exceed the following generic criteria: Take protective actions and other response actions		
E <sup>a</sup>	10 mSv per annum	Restrict non-essential <sup>b</sup> use. Use essential vehicles, equipment and other items from an affected area until replacements are available provided that: <ul style="list-style-type: none"> <li>(a) their use will not result in doses exceeding the generic criteria given in Table II.2 for a member of the public or the guidance values given in Appendix 4 for restricting the exposure of emergency workers, and</li> <li>(b) actions are taken to control the dose to the user as an emergency worker, helper in an emergency or a member of the public, as appropriate.</li> </ul> Estimate the exposure of those emergency workers, helpers in an emergency and members of the public who may have used a vehicle, equipment and other item from an affected area to determine whether this could have resulted in a dose warranting medical attention in accordance with Table II.2.
H <sub>fetus</sub> <sup>c</sup>	10 mSv for the full period of in utero development	

Table 5 provides generic criteria aimed at the effective implementation of response actions to reduce the non-radiological consequences of a nuclear or radiological emergency by providing a basis for the continuation or the resumption of international trade.

Values that exceed the generic criteria in Table 5 may be acceptable under emergency (temporary) conditions.

The generic criteria for food traded internationally derive from the level used by the Joint Food and Agriculture Organization of the United Nations (FAO)/World Health Organization (WHO) Codex Alimentarius Commission. These generic criteria, and generic criteria for other commodities traded internationally that could contain radionuclide following a nuclear or radiological emergency, are established at 1/100 of the generic criteria given in Table 2 for early protective actions and other response actions to ensure that doses to the public would be a small fraction of those for which actions are warranted to reduce the risk of stochastic effects.

For food traded internationally that could contain radionuclide following a nuclear or radiological emergency, the operational criteria (i.e. guideline levels) as published by the Joint FAO/WHO Codex Alimentarius Commission may ultimately be used.

If restricting trade in food and other commodities could result in severe health impacts or other detrimental effects in another State, then the food and other commodities that would give rise to a projected dose that exceeds the generic criteria in Table 5 may be traded, if the trade is justified, until replacements are available, provided that:

- (a) The trade is approved with the receiving State;
- (b) The trade will not result in doses that exceed the generic criteria for the public given in Table 2 and Table 3;
- (c) Actions are taken to manage and control exposures during shipping; and
- (d) Actions are taken to control the consumption of food and use of other commodities and to reduce the exposure of members of the public.

Generic criteria shall be established in terms of the projected dose for the implementation of protective actions and other actions aimed at enabling the termination of a nuclear or radiological emergency and the subsequent transition to an existing exposure situation with due consideration of, and verification of the fulfillment of, the conditions set out in Requirement 19 of Annex II of this regulation.

These criteria are established as 1/5 of the generic criteria for the early protective actions and other response actions given in Table 2 and are:

- (a) An effective dose of 20mSv per year; and
- (b) An equivalent dose to a fetus of 20mSv for the full period of in utero development.

The decision to terminate the nuclear or radiological emergency and the subsequent transition to an existing exposure situation is to be taken after;

- (a) Justified actions have been taken to reach the generic criteria for enabling the transition to an existing exposure situation and it has been confirmed that any further actions to reach these criteria would do more harm than good;
- (b) Confirmation that the source of exposure is fully characterized for all members of the public living as normal in the area;
- (c) The situation with regard to exposure has been understood and has remained stable;
- (d) Any restrictions on normal living conditions are limited and provisions are in place to confirm compliance with such restrictions; and
- (e) Confirmation that interested parties, including the public, have been consulted and are being kept informed about the basis for the adjustment of emergency response actions and for the transition, with the associated health hazards put into perspective.

**Table 6. Generic Criteria for Food and Other Commodities Traded Internationally**

Generic Criteria		Protective Actions and Other Response Actions
<b>Projected dose from food and other commodities that exceed the generic criteria:</b> Take response actions to restrict international trade.		
E <sup>a</sup>	1 mSv per annum	Restrict non-essential <sup>P</sup> international trade. Trade essential food and other commodities until replacements are available if: (a) Trade is approved with the receiving State; (b) Trade will not result in doses to the public that exceed the generic criteria given in Table 2 for all exposure pathways and in Table 3 for the respective pathways; (c) Actions are taken to manage and control the dose during shipping; and (d) Actions are taken to control the consumption and use of food and other commodities and to reduce the exposure of members of the public
Hfetus <sup>c</sup>	1 mSv for the full period of in utero development	

**Annex III. Guidance Values for Restricting Exposure of Emergency Workers**

This Annex provides guidance values as a basis for operational guidance for restricting the exposure of emergency workers.

Table 6 of this regulation provides guidance values for restricting the exposure of emergency workers in an emergency response in terms of personal dose equivalent Hp(10) from external exposure to strongly penetrating radiation. The values for Hp(10) in Table 6 assume that every effort has been made for protection against external exposure to weakly penetrating radiation and against exposure due to intakes or skin contamination.

The total effective dose and the Relative Biological Effectiveness (RBE) weighted absorbed dose to a tissue or organ via all exposure pathways (i.e. both dose from external exposure and committed dose from intakes) need to be estimated as early as possible in a nuclear or radiological emergency. Table 6 also provides guidance on the effective dose and the RBE weighted absorbed dose to a tissue or organ for consideration in restricting further exposure in the response to a nuclear or radiological emergency once these doses have been estimated.

Severe deterministic effects to a fetus could possibly occur following an equivalent dose to the fetus of greater than 100 mSv. Consequently, in the response to a nuclear or radiological emergency, female workers who are aware that they are pregnant or who might be pregnant need to be:

- (a) Informed of this risk; and
- (b) Excluded from taking actions that might result in an equivalent dose to the embryo and fetus exceeding 50 mSv for the full period of in utero development of the embryo and fetus.

These guidance values are set to be two to ten times lower than the generic criteria in Table 1 of this regulation and they apply for:

- (a) The dose from external exposure to strongly penetrating radiation for Hp (10). Doses from external exposure to weakly penetrating radiation and from intake or skin contamination need to be prevented by all possible means. If this is not feasible, the effective dose and the RBE weighted absorbed dose to a tissue or organ (values of RBE weighted absorbed dose to a tissue or organ is provided in Table 1 of this regulation) have to be limited to minimize the health risk to the individual in line with the risk associated with the guidance values given here; and
- (b) The total effective dose (E) and the RBE weighted absorbed dose to a tissue or organ ADT via all exposure pathways (i.e. both dose from external exposure and committed dose from intakes) which are to be estimated as early as possible in order to enable any further exposure to be restricted as appropriate.

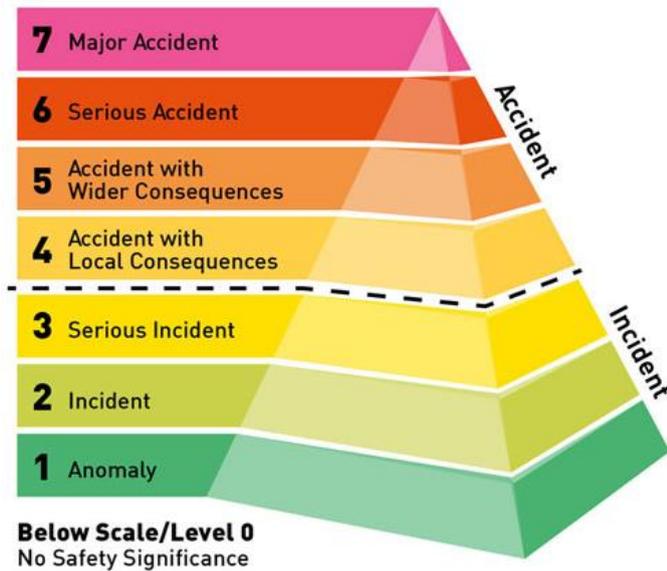
**Table 7. Guidance Values for Restricting Exposure of Emergency Workers**

Tasks	Guidance Value		
	Hp(10)	E	AD <sub>T</sub>
<b>Lifesaving actions</b>	<500 mSv	<500 mSv	<1/2 AD <sub>T</sub>
	This value may be exceeded, with due consideration of the generic lifesaving actions criteria in Table 1 of this regulation, under circumstances in which the expected benefits to others clearly outweigh the emergency worker's own health risks, and the emergency worker volunteers to take the action and understands and accepts these health risks		
Actions to prevent severe deterministic effects and actions to prevent the development of catastrophic conditions that could significantly affect people and the environment	< 500 Sv <i>1/2AD<sub>T</sub></i>	<500 mSv	
Actions to avert a large collective dose	< 500 Sv <i>1/2AD<sub>T</sub></i>	<500 mSv	

#### Annex IV. Classification of a Nuclear or Radiological Emergency

Emergency Class	Applicable to Categories	Actions to be Taken
General Emergency	I and II	Upon declaration of this emergency class, appropriate actions shall promptly be taken, based on the available information relating to the emergency, to mitigate the consequences of the emergency on the site and to protect people on the site and off the site.
Site Area Emergency	I and II	<p>Upon declaration of this emergency class, actions shall promptly be taken to:</p> <ul style="list-style-type: none"> <li>(i) Mitigate the consequences of the emergency on the site and to protect people on the site;</li> <li>(ii) Increase the readiness to take protective actions and other response actions off the site if this becomes necessary on the basis of observable conditions, reliable assessments and results of monitoring; and</li> <li>(iii) Conduct off-site monitoring, sampling and analysis.</li> </ul>
Facility Emergency	I, II and III	Upon declaration of this emergency class, actions shall promptly be taken to mitigate the consequences of the emergency and to protect people at the facility and on the site. Emergencies in this class do not present an off-site hazard.
Alert	I, II and III	Upon declaration of this emergency class, actions shall promptly be taken to assess and to mitigate the potential consequences of the event and to increase the readiness of the on-site response organizations.
Nuclear or Radiological Emergency at An Unforeseen Location	IV	Upon declaration of this emergency class and the level of emergency response, actions shall promptly be taken to mitigate the consequences of the emergency on the site, to protect those in the vicinity (e.g. workers and emergency workers and the public) and to determine where and for whom protective actions and other response actions are warranted

**Annex V. The INES scale**



**Description of the scale**

	AREA OF IMPACT		
	OFF-SITE IMPACT	ON-SITE IMPACT	IMPACT ON DEFENCE IN DEPTH
<b>7</b> MAJOR ACCIDENT	<b>MAJOR RELEASE: WIDESPREAD HEALTH AND ENVIRONMENTAL EFFECTS</b>		
<b>6</b> SERIOUS ACCIDENT	<b>SIGNIFICANT RELEASE: LIKELY TO REQUIRE FULL IMPLEMENTATION OF PLANNED COUNTERMEASURES</b>		
<b>5</b> ACCIDENT WITH OFF- SITE RISKS	<b>LIMITED RELEASE: LIKELY TO REQUIRE PARTIAL IMPLEMENTATION OF PLANNED COUNTERMEASURES</b>	<b>SEVERE DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS</b>	
<b>4</b> ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK	<b>MINOR RELEASE: PUBLIC EPOSURE OF THE ORDER OF PRESCRIBED LIMITS</b>	<b>SIGNIFICANT DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS/FATAL</b>	

		<b>EXPOSURE OF A WORKER</b>	
<b>3</b> SERIOUS INCIDENT	<b>VERY SMALL RELEASE: PUBLIC EXPOSURE AT A FRACTION OF PRESCRIBED LIMITS</b>	<b>SEVERE SPREAD OF CONTAINATION/ ACUTE HEALTH EFFECTS TO A WORKER</b>	<b>NEAR ACCIDENT NO SAFETY LAYERS REMAINING</b>
<b>2</b> INCIDENT		<b>SIGNIFICANT SPREAD OF CONTAMINATION/ OVEREXPOSURE OF A WORKER</b>	<b>INCIDENTS WITH SIGNIFICANT FAILURES IN SAFETY PROVISIONS</b>
<b>1</b> ANOMALY			<b>ANOMALY BEYOND THE AUTHORIZED OPERATING REGIME</b>
<b>0</b> DEVIATION	<b>NO SAFETY SIGNIFICANCE</b>		

## Annex VI. Safe distances and security perimeters in radiological emergencies

Situation	Initial radius of inner cordoned area (safe distance)
Intact package with a I-WHITE, II-YELLOW or III-YELLOW label	Immediate area around the package
Damaged package with a I-WHITE, II-YELLOW or III-YELLOW label	30 m radius or at: - Ambient dose readings of 100 $\mu\text{Sv/h}$ - 1000 Bq/cm <sup>2</sup> gamma/beta deposition - 100 Bq/cm <sup>2</sup> alpha deposition
Undamaged common source (consumer item) such as smoke detector	None
Other unshielded or unknown source (damaged or undamaged)	30 m radius or at - Ambient dose readings of 100 $\mu\text{Sv/h}$ - 1000 Bq/cm <sup>2</sup> gamma/beta deposition - 100 Bq/cm <sup>2</sup> alpha deposition
Spill	Spill area plus 30 m around
Major spill	Spill area plus 300 m around
Fire, suspected RDD, explosion or fumes, spent fuel, plutonium spill	300 m radius (or more to protect against effects of an explosion) or at - Ambient dose readings of 100 $\mu\text{Sv/h}$ - 1000 Bq/cm <sup>2</sup> gamma/beta deposition - 100 Bq/cm <sup>2</sup> alpha deposition
Explosion/fire involving nuclear weapons (no nuclear yield)	1000 m radius or at: - Ambient dose readings of 100 $\mu\text{Sv/h}$ - 1000 Bq/cm <sup>2</sup> gamma/beta deposition - 100 Bq/cm <sup>2</sup> alpha deposition

Consider the following generic protective actions for inner-cordoned area (inside safety perimeter):

**First Responders:** remove non-essential personnel and members of the public; if contamination is suspected monitor them and decontaminate as necessary; perform lifesaving actions (do not delay due to the presence of radiation); use respiratory protection (if airborne contamination is suspected), avoid inadvertent ingestion.

**Public** (in approximately twice the radius of inner-cordoned area): do not eat possibly contaminated food until monitored; avoid the smoke; if in smoke get monitored; avoid inadvertent ingestion. For other response actions in radiological emergencies see Appendix 7: Action guide for radiological emergencies.

## **Annex VII. The outline of emergency plans.**

This outline is for the emergency plans. Detailed information or information that may change frequently should be provided by reference to other documents available to planners.

### **TITLE (COVER) PAGE**

On the title (cover) page write the title of the plan, approval date, version number, and signatures. The signatures should include those of the heads of all the participating departments in the facility and authority responsible for the local off-site response and any organization providing emergency services support to on-site response such as local emergency services or supporting medical institutions.

### **CONTENTS**

#### **1. INTRODUCTION**

##### **1.1 Purpose**

Describe the purpose of the plan, for example: “The plan provides the basis for (name of the facility) response to a radiation emergency that is effectively integrated with the local and national off-site response.”

##### **1.2 Participating organizations**

List all organizations participating in the plan. Here you may include the list of organizations which whom the facility has written protocols, agreements or MoU.

##### **1.3 Scope**

Describe the scope of the plan, for example: “The plan addresses the response by (name of facility) to an actual or perceived radiation hazard in order to co-ordinate the response to protect public health and safety.” The plan does not provide sufficient detail for an adequate response. This level of detail should be contained in procedures that are developed based on the plan.

##### **1.4 Legal basis**

List the national laws, codes or statutes that define responsibility for planning, decisions and actions governing the response to radiation and conventional emergencies and criminal activities.

Include here the current regulation.

##### **1.5 Related plans and documents**

Describe the relationships to the local jurisdictions’ emergency plan, the NREP and other plans that are to be used simultaneously with this plan. Provide a complete list of all the supporting documents in an appendix.

## **2. PLANNING BASIS**

### **2.1 Types of radiological hazards**

Give a brief description of the characteristics of facility emergencies that were considered in development of the plan. This should include the results of a comprehensive safety analysis and low probability events.

### **2.2 Terms**

Refer to an appendix for standard definitions of terms that should be used consistently in other plans and procedures in order to promote co-ordination. Where possible, the terms used by the organizations involved in the response to conventional emergencies should be adopted.

### **2.3 Response roles and responsibilities**

Describe the roles and responsibilities of the on-site departments, off-site organizations and corporate management in this plan. Discuss responsibility for authorizing/activating the response and directing the total on-site response in relation to time.

Show how responsibilities would differ as the on-site staff is augmented or in other circumstances (e.g. simultaneous execution of the security plan).

Describe how responsibilities are delegated or transferred.

### **2.4 Response organization**

Provide a block diagram of the on-site response organization components (sections, groups, teams or positions) with a brief description of responsibilities of each “block” and the emergency facility or location where these organizational elements will probably perform. Show how the organization integrates into the off-site organization structure, and describe participation in the off-site response command group and other appropriate organizational components, such as the public information or radiological assessment groups. A detailed discussion of authorities, responsibilities, and duties of the organizational components should be provided in the implementing procedures for the component.

### **2.5 Response facilities**

Describe the response facilities that may be functional during a response.

### **2.6 Response communications**

Describe systems used for communication with off-site officials, emergency services, in-plant personnel and teams, and environmental monitoring teams. Describe how continued compatibility of communications will be maintained.

### **2.7 Logistics/resource commitments**

Describe the arrangements, including the organizational component responsible during a response for providing logistics support, for prompt procurement of needed supplies and services, possibly bypassing normal procurement arrangements. Describe the resources of government agencies and other organizations that will be made available to meet their obligations under the plan or that could be provided as assistance to local governments or other States. Describe the conditions under which resources will be provided.

## **2.8 Concept of operations**

Give a brief description of the ideal response of your organization in the context of the total response.

## **3. EMERGENCY RESPONSE PROCESS**

Describe the arrangements for the organizations to perform their functions assigned under this regulation and also under other legislation to carry out the functions in the following subsection and, where appropriate, to co-ordinate them under the NREP. Identify the response organization component responsible for performing the functions. Refer to the appropriate implementing procedures that will be used during an emergency to carry out each function.

### **3.1 Notification, activation and request for assistance**

Describe the arrangements, including those for the emergency organization responsible, for declaration of an emergency, off-site notification, activation of the response organization, and transition to the on-site response organizations.

The classification system and the emergency action levels (EALs) used to decide on the level of emergency to declare should be consistent with the provisions of this regulation.

### **3.2 Emergency management**

Describe the command and control system used to manage the onsite response and the relationship to the local jurisdiction command and control system and, if appropriate, how it will function in the event of simultaneous response under other on-site plans (e.g. security plan). This should include a single on-site emergency manager and integration, as soon as practical, into the off-site ICS command group. Refer to the appropriate implementing procedures that will be used during an emergency to carry out these functions. This should include an overall procedure for on-site response for the on-site emergency manager guiding the response to each type of emergency.

### **3.3 Performing mitigation**

Describe the arrangements for technical support for the operations staff, on-site damage control, firefighting, and medical aid and describe arrangements to obtain off-site emergency services assistance.

### **3.4 Taking urgent protective action**

Describe the arrangements to promptly recommend off-site protective actions to off-site officials, including criteria based on facility conditions and environmental measurements. Describe the

arrangements for protection of on-site personnel. Maps of the on-site area, showing assembly points, sheltered areas, and evacuation routes should be provided in an appendix.

### **3.5 Providing information, warnings and instructions to the public**

Describe the provisions for the on-site organization to support the local jurisdiction arrangements to perform this function.

### **3.6 Protecting emergency workers**

Describe the arrangements to protect on-site responders against all anticipated hazards.

### **3.7 Providing medical assistance and mitigating the non-radiological consequences**

Describe the on-site arrangements for treatment/first aid, dose reconstruction, decontamination and transport of injured people and for initial off-site treatment.

### **3.8 Assessing the initial phase**

Describe the on-site system to assess plant conditions and environmental releases used to assess the course of the emergency and determine the event classification and potential off-site consequences. Describe the arrangements for conducting environmental monitoring on and near the site in co-ordination with off-site response, and include the default OILs to be used. Describe the teams available and other organization elements involved and provisions for participation in the radiological monitoring and assessment centre (RMAC).

### **3.9. Keeping the public informed (media relations)**

Describe the arrangements to co-ordinate providing information to the media with the off-site jurisdictions through a single spokesperson or during joint briefings with off-site officials at the PIC.

### **3.10 Conducting recovery operations**

Describe how the transition to recovery operations will be coordinated with off-site officials.

### **3.11 Financing operations**

Describe the system for financing of operations and reimbursement of organizations that provide support during a response. This could be that the cost of each government agency's participation in support of the plan is the responsibility of that organization, unless other agreements exist.

### **3.12 Maintaining records and management of data**

Describe the arrangements to ensure that relevant information is recorded and retained for use in evaluations conducted after the emergency, and for long term health monitoring and follow-up of emergency workers and members of the public who may be affected.

## **4. EMERGENCY PREPAREDNESS PROCESS**

Describe the arrangements, and the responsible person, to perform the functions listed in the subsections below which are needed to develop and maintain the capability to respond to an emergency as described in the plan. Refer to the appropriate implementing procedures that will be used routinely to ensure these preparedness functions are adequately performed.

### **4.1 Authorities and responsibilities**

### **4.2 Organization**

### **4.3 Co-ordination**

### **4.4 Plans and procedures**

### **4.5 Logistical support and facilities**

### **4.6 Training**

### **4.7 Exercises**

### **4.8 Quality management programme**

## **REFERENCES**

## **LIST OF ABBREVIATIONS**

## **DISTRIBUTION LIST**

List (and distribute to) all individuals/organizations that are parties to this plan or that will be developing response arrangements that should be consistent with this plan.

## **APPENDICES**

### **Appendix 1 - Organization authorities, responsibilities and capabilities**

Describe organization authorities, responsibilities, capabilities and resources in emergency situations.

### **Appendix 2 - Agreements**

List summarized agreements to receive assistance from offsite emergency services and off-site medical institutions.

### **Appendix 3 - Emergency planning maps and diagrams**

Provide (or refer to publications providing) maps/diagrams of the on-site area or facility showing assembly points, sheltered areas, evacuation routes, monitoring/sampling locations, emergency facilities, and areas that are potentially hazardous under emergency conditions.

#### **Appendix 4 - Emergency classification system**

Provide a description of the emergency classification system and associated EALs.

#### **Appendix 5 – Protective Action**

Provide (or refer to a publication providing) a summary of the protective actions to be implemented on-site and recommended to off-site authorities for each class of emergency.

#### **Appendix 6 - Facilities and specialized radiological resources**

List (or refer to publications listing) major facilities and radiological resources that are needed to implement the plan and that may be provided to support local governments, and the organizations responsible for providing them. This should include, as appropriate, the response teams listed in Appendix 15. List the organizations (e.g. research reactors, universities) that could be sources of additional specialized personnel and equipment.

#### **Appendix 7 - Supporting documentation**

List all the supporting documentation relevant for maintenance and implementation of the plan.

**SEEN TO BE ATTACHED TO THE REGULATION N° 004/R/RS-NRP/RURA/2021 OF 16/11/2021 ON RADIOLOGICAL AND NUCLEAR EMERGENCY PREPAREDNESS AND RESPONSE**

**Done at Kigali on 16/11/2021**

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**Dr Ignace GATARE**  
**Chairperson of the Regulatory Board**