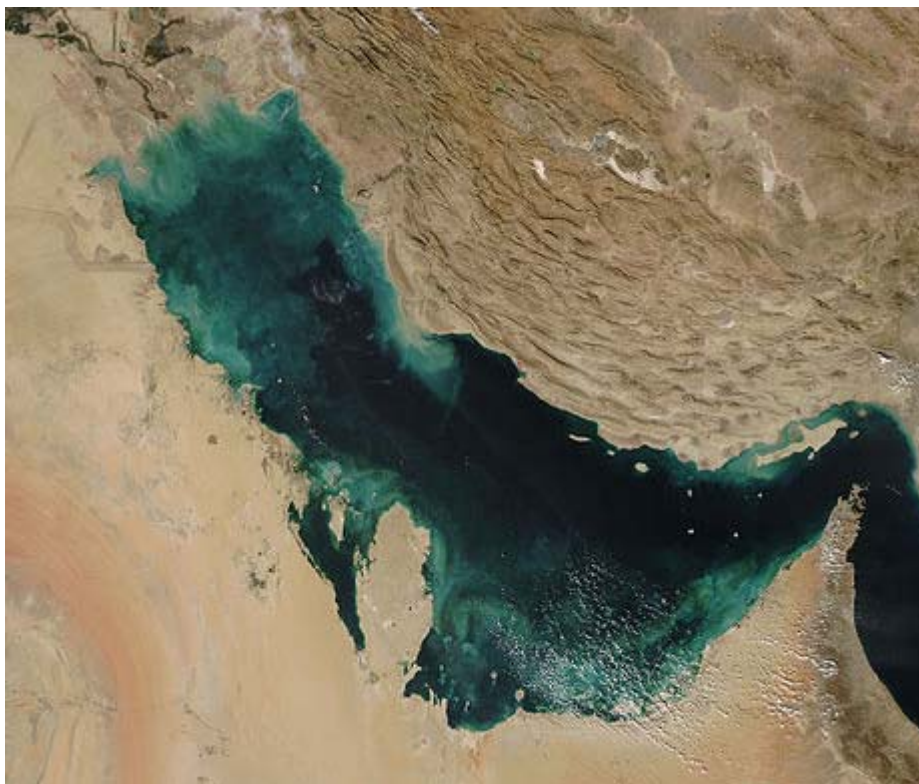


**ROPME SEA AREA  
REGIONAL RADIOLOGICAL/NUCLEAR EMERGENCY  
RESPONSE PLAN**

**Volume 3**

**EMERGENCY PROCEDURES**



12005-01-008  
Version 3.0  
29 February 2012

**Prepared by:**

J.F. Lafortune, PhD., P.Eng., Mike McCall, M.Eng., P.Eng., Regional Radiological/Nuclear Response Officers, MEMAC and in cooperation with the IAEA

## Annual Review Certification

I hereby certify that I reviewed the *ROPME Radiological/Nuclear Emergency Response Plan, Volume 3, Emergency Procedures*. This plan incorporates all necessary changes. I distributed changed pages to all recorded holders of the plan.

Date	Name/Signature

## Record of Changes

Change Number	Date of Change	Date Entered	Change Made By (Signature)

## TABLE OF CONTENTS

<b>TABLE OF CONTENTS.....</b>	<b>iii</b>
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 Preamble .....	1
1.2 Regional emergency response plan .....	1
1.3 Participating Member States .....	1
1.4 Structure .....	1
1.5 Objective .....	3
1.6 Scope.....	3
1.7 Structure of this document.....	3
1.8 Terminology .....	3
<b>2. IDENTIFYING, NOTIFYING AND ACTIVATING .....</b>	<b>4</b>
2.1 Introduction .....	4
2.2 Identifying .....	4
2.2.1 <i>Responsibility</i> .....	4
2.2.2 <i>Purpose</i> .....	4
2.2.3 <i>Input</i> .....	4
2.2.4 <i>Output</i> .....	5
2.2.5 <i>Identifying Procedure</i> .....	5
2.3 Notifying.....	6
2.3.1 <i>Responsibility</i> .....	6
2.3.2 <i>Purpose</i> .....	6
2.3.3 <i>Input</i> .....	6
2.3.4 <i>Output</i> .....	6
2.3.5 <i>Notifying Procedure</i> .....	6
2.4 Activating .....	8
2.4.1 <i>Responsibility</i> .....	8
2.4.2 <i>Purpose</i> .....	8
2.4.3 <i>Input</i> .....	8
2.4.4 <i>Output</i> .....	8
2.4.5 <i>Activating Procedure</i> .....	8
APPENDIX 1 TO NOTIFYING PROCEDURE A and B: REGIONAL NOTIFICATION FORM .....	10
APPENDIX 1 TO NOTIFYING PROCEDURE C: IAEA NOTIFICATION FORM.....	11
APPENDIX 2 TO NOTIFYING PROCEDURE C: IAEA FOLLOW UP INFORMATION FORM.....	13
<b>3. GENERAL PROCEDURES FOR THE RNCT CHAIR .....</b>	<b>17</b>
3.1 Responsibility .....	17
3.2 Purpose .....	17
3.3 Input.....	17
3.4 Output.....	17
3.5 Procedure.....	17
3.5.1 <i>Immediate actions</i> .....	17
3.5.2 <i>Ongoing actions</i> .....	18
APPENDIX 1 TO RNCT CHAIR PROCEDURE: STANDARD CRISIS MANAGEMENT CYCLE (Example) .....	19
APPENDIX 2 TO RNCT CHAIR PROCEDURE: GUIDELINES FOR CONDUCTING CRISIS MANAGEMENT MEETINGS .....	20
APPENDIX 3 TO RNCT CHAIR PROCEDURE: MS SITUATION REPORT FORMAT .....	21

---

<b>4.</b>	<b>GENERAL PROCEDURES FOR THE RNCT DELEGATES .....</b>	<b>22</b>
4.1	Responsibility .....	22
4.2	Purpose .....	22
4.3	Input.....	22
4.4	Output.....	22
4.5	Procedure.....	22
4.5.1	<i>Immediate actions</i> .....	22
4.5.2	<i>Ongoing actions</i> .....	22
	APPENDIX 1 TO PROCEDURE FOR RNCT DELEGATES: RNCT DELEGATE SITUATION REPORT FORMAT ....	24
<b>5.</b>	<b>GENERAL PROCEDURES FOR THE SENIOR TECHNICAL ADVISOR .....</b>	<b>25</b>
5.1	Responsibility .....	25
5.2	Purpose .....	25
5.3	Input.....	25
5.4	Output.....	25
5.5	Procedure.....	25
5.5.1	<i>Immediate actions</i> .....	25
5.5.2	<i>Plume tracking</i> .....	26
5.5.3	<i>On-scene surveys</i> .....	26
5.5.4	<i>Wide area surveys</i> .....	26
5.5.5	<i>Dose projection</i> .....	26
5.5.6	<i>Making recommendations for protective actions for the public</i> .....	27
5.5.7	<i>Making recommendations for the protection of workers</i> .....	27
	APPENDIX 1 TO PROCEDURE FOR THE STA: INTERVENTION AND ACTION LEVELS .....	28
<b>6.</b>	<b>GENERAL PROCEDURES FOR ON-SCENE RESPONSE .....</b>	<b>29</b>
6.1	Responsibility .....	29
6.2	Purpose .....	29
6.3	Input.....	29
6.4	Output.....	29
6.5	Procedure.....	29
6.5.1	<i>Upon Arrival</i> .....	29
6.5.2	<i>Safety Measures</i> .....	30
6.5.3	<i>Security Measures</i> .....	30
6.5.4	<i>Casualty Management</i> .....	31
6.5.5	<i>Standard Procedures</i> .....	31
<b>7.</b>	<b>CASUALTY MANAGEMENT PROCEDURES.....</b>	<b>32</b>
7.1	Responsibility .....	32
7.2	Purpose .....	32
7.3	Input.....	32
7.4	Output.....	32
7.5	Procedure.....	32
<b>8.</b>	<b>PROCEDURES FOR THE PROTECTION OF EMERGENCY WORKERS .....</b>	<b>34</b>
8.1	Responsibility .....	34
8.2	Purpose .....	34
8.3	Input.....	34
8.4	Output.....	34
8.5	Procedure.....	34
8.5.1	<i>Responders at the scene</i> .....	34

---

8.5.2	<i>Responders away from the scene</i> .....	35
<b>9.</b>	<b>DOSE PROJECTION PROCEDURES</b> .....	<b>37</b>
9.1	Responsibility .....	37
9.2	Purpose .....	37
9.3	Input.....	37
9.4	Output.....	37
9.5	Procedure.....	37
<b>10.</b>	<b>SITUATION REPORT PROCEDURE</b> .....	<b>39</b>
10.1	Responsibility .....	39
10.2	Purpose .....	39
10.3	Input.....	39
10.4	Output.....	39
10.5	Procedure.....	39
	APPENDIX 1 TO SITUATION REPORT PROCEDURE: MS BRIEFING FORMAT.....	40
<b>11.</b>	<b>RADIATION MEASUREMENT AND REPORTING PROCEDURE</b> .....	<b>41</b>
11.1	Responsibility .....	41
11.2	Purpose .....	41
11.3	Input.....	41
11.4	Output.....	41
11.5	Procedure.....	41
11.5.1	<i>For nuclear power plant (land or marine-based)</i> .....	41
11.5.2	<i>For emergencies involving alpha emitters</i> .....	41
11.5.3	<i>In all cases</i> .....	41
	APPENDIX 1 TO RADIATION MEASUREMENT AND REPORTING PROCEDURE: RECORDING RADIATION READINGS.....	42
<b>12.</b>	<b>REQUEST FOR ASSISTANCE PROCEDURE</b> .....	<b>43</b>
12.1	Responsibility .....	43
12.2	Purpose .....	43
12.3	Input.....	43
12.4	Output.....	43
12.5	Procedure.....	43
	APPENDIX 1 TO REQUEST FOR ASSISTANCE PROCEDURE: REQUEST FOR ASSISTANCE FORM .....	44
<b>13.</b>	<b>INTERVIEWS WITH THE MEDIA PROCEDURE</b> .....	<b>45</b>
13.1	Responsibility .....	45
13.2	Purpose .....	45
13.3	Input.....	45
13.4	Output.....	45
13.5	Procedure.....	45
	<b>ANNEX A – CONTACT LIST</b> .....	<b>46</b>
	<b>ANNEX B – PROTECTIVE ACTIONS: RISK AND BENEFITS</b> .....	<b>47</b>
	<b>ANNEX C – INTERVENTION AND ACTION LEVELS</b> .....	<b>48</b>
	<b>ANNEX D – INTERNATIONAL NUCLEAR EVENT SCALE (INES)</b> .....	<b>49</b>
	<b>ANNEX E – GLOSSARY</b> .....	<b>50</b>
	<b>ANNEX F – LIST OF ABBREVIATIONS</b> .....	<b>54</b>

## LIST OF TABLES

Table 1: Classification Levels.....	5
Table 2: MS Activation Levels by classification .....	9
Table 3: Recommendations for Protective Actions for the public.....	27
Table 4: Protective action intervention levels .....	28
Table 5: Action levels for restricting contaminated food .....	28
Table 6: Safety perimeter guidelines .....	30
Table 7: Protective Measures based on hazard.....	35
Table 8: Recommended emergency workers protective posture .....	35
Table 9: Recommended emergency workers protection based on dose rates.....	35
Table 10: Recommended emergency workers protection based on projected dose .....	35
Table 11: Authority required to exceed given dose.....	36
Table 12: Sample Recording Template .....	42
Table 13: Request for Assistance Form.....	44
Table A-14: Contact list .....	46
Table B-15: Risk/benefits of protective actions .....	47
Table C-16: Protective action intervention levels.....	48
Table C-17: Action levels for restricting contaminated food.....	48
Table D-18: INES Levels.....	49

## LIST OF FIGURES

Figure 1: Regional area covered by the emergency plan.....	2
--	---

## **1. INTRODUCTION**

---

### **1.1 Preamble**

Radiation emergencies (radiological, nuclear and terrorism; hereinafter referred to as RN) represent one type of emergency that could significantly affect the Regional Organization for the Protection of the Marine Environment (ROPME) sea area (RSA) – see Figure 1. Planning for, and responding to a RN emergency requires a coordinated effort at all levels: local, regional, national and international. This coordination needs to be harmonized with other existing mechanisms and processes that have been developed to manage crises in general and to ensure a clear, coordinated and effective response.

### **1.2 Regional emergency response plan**

The documents comprising the regional plan were developed to provide the required response structure and guidance to support a regional, coordinated response to an RN emergency in international waters within the RSA.

This regional plan, championed by the ROPME and the Marine Emergency Mutual Aid Center (MEMAC), is entitled the RSA (Regional) RN Emergency Response Plan (RNERP).

### **1.3 Participating Member States**

The RSA RNERP includes the following participating Member States (MS):

- Kingdom of Bahrain;
- Islamic Republic of Iran;
- State of Kuwait;
- Sultanate of Oman;
- State of Qatar;
- Kingdom of Saudi Arabia; and
- United Arab Emirates.

All of these MS have a vested interest in the ongoing safety within the ROPME RSA, the safety and health of their population and the protection of the environment.

### **1.4 Structure**

The RNERP is comprised of three volumes as follows:

- Volume 1 – Planning Basis;
- Volume 2 – Regional Radiological/Nuclear Emergency Response Plan (RNERP):
  - Volume 2a – Operational response plan; and
  - Volume 2b – Preparedness plan; and
- Volume 3 – Emergency Procedures.

This document is Volume 3 – Emergency Procedures.

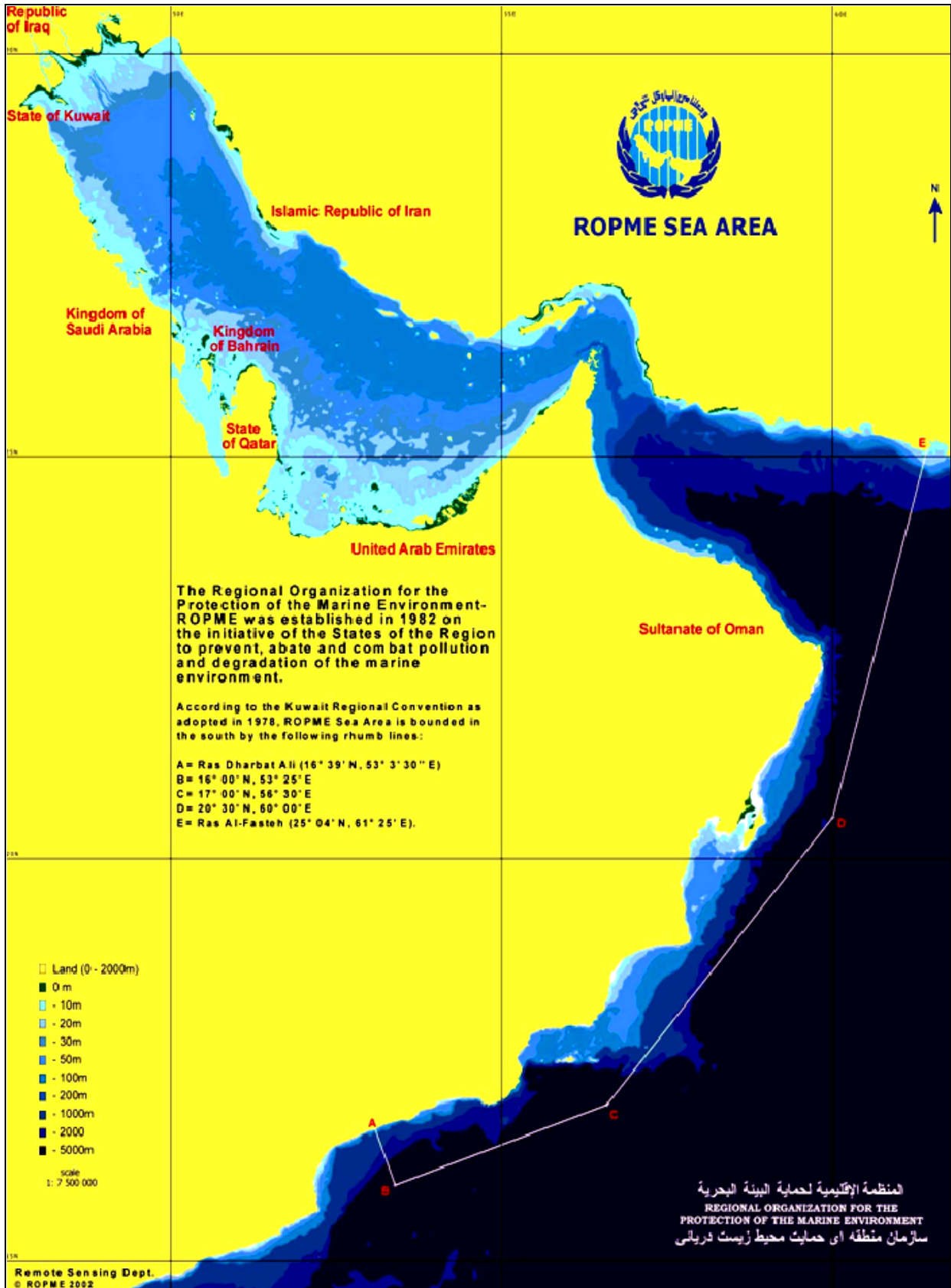


Figure 1: Regional area covered by the emergency plan



## **1.5 Objective**

The aim of this Emergency Procedures document is to provide the RNCT with the general procedures required to conduct RN emergency response in accordance with the Volume 2a – Operational Response Plan.

## **1.6 Scope**

This document provides procedures for the regional response described in the Operational Response Plan. Procedures are not included for specific (i.e., MS) on-scene response. These procedures need to be utilized in conjunction with all volumes of the RNERP identified in Section 1.4. In these procedures, 'regional' or 'region' refers to the RSA.

## **1.7 Structure of this document**

The procedures in this document are structured to follow the framework of IAEA GS-R-2 [1]. The procedures are written based on the required input and expected output. Where applicable, the required forms and detailed instructions are included as Appendices to the Procedure.

## **1.8 Terminology**

A glossary and list of abbreviations are provided at the end of this document in Annexes E and F, respectively.

## **2. IDENTIFYING, NOTIFYING AND ACTIVATING**

---

### **2.1 Introduction**

In the event of a radiological/nuclear (RN) emergency occurring in international waters, or an RN emergency within a Member State (MS) that requires off-site emergency response, MS response management are required to notify the MEMAC EOC and provide detailed information on the emergency. The first MS to arrive on-scene, or the MS that has the greatest potential to be impacted by the emergency, will assume the Lead role in the initial response effort. The Lead MS may provide a provisional classification of the emergency with this initial notification. Upon receipt of the initial notification from the Lead MS, the MEMAC Duty Officer will report the provisional classification level to the Duty RNCT STA and Duty RNCT Chair. The declared classification will subsequently lead to the appropriate activation of the RNCT.

### **2.2 Identifying**

The first step in effective emergency response is identifying that a situation exists. There are several methods for determining that an RN emergency is occurring. These include notification from the IAEA, notification from the owner nation, notification from First responders wearing dosimeters, or a confirmed alarm at one of the RSA fixed detectors, etc. It is critical that any report of an RN emergency be confirmed verbally or by redundant detector verification, etc.

#### **2.2.1 Responsibility**

The Lead MS should provide a provisional classification of the emergency or the required level of emergency response as part of the emergency description to the MEMAC Duty Officer. Following notification, the Duty RNCT Chair and STA will review the information and determine the definitive regional classification level. Periodic review of the classification and, if required, revisions to the classification will be completed by the RNCT.

#### **2.2.2 Purpose**

Effective identification allows the emergency to be properly classified prior to the notification and activation of the RNCC. This is critical and will ensure that the RNCT is able to:"

- Effectively categorize the potential severity of an emergency to ensure that proper mitigation measures are taken outside MS borders, including recommendations for actions to be taken in international waters (e.g., redirecting vessel traffic within the Gulf, establishment of an exclusion zone, etc.);
- Confirm and effectively communicate the severity of an emergency;
- Trigger activation levels and initiate automatic actions; and
- Provide supporting assets to the MS to aid in mitigation, as required.

#### **2.2.3 Input**

The Duty RNCT STA requires specific information from the reporting MS in order to effectively classify the emergency and provide proper notification to all MS. If not provided initially by the reporting MS, the MEMAC Duty Officer must request that the following information be communicated during initial notification:

- Information about the emergency detection (i.e., release, contamination, fire, etc.) from the Lead MS as communicated by MS OSC or EOC;
- Radiation levels, if available;
- Dose projections, if available; and
- Trends with respect to the radiological hazard (e.g., is the intensity of the release increasing, decreasing or holding steady?).

### 2.2.4 Output

Once the STA has received the necessary information from the reporting MS, the following initiating decisions can be determined and communicated:

- The RNCT emergency classification level; and
- The activation level for the RNCT and responding agencies.

### 2.2.5 Identifying Procedure

To facilitate the classification process, the STA and RNCT Chair will be required to perform the following tasks:

- 1) Review the available information provided by the reporting MS to the MEMAC Duty Officer or STA;
- 2) Any classification level that has already been provided by the Lead MS reporting the emergency will be considered as the provisional classification:
  - a. It may be necessary for the STA to recommend revising the classification level that is reported to other MS; and
  - b. Revisions made to a classification would only be made after consultation with the Lead MS;
- 3) Classify and confirm the emergency in accordance with information from the reporting MS, as described in Table 1 (within 30 minutes). Once the emergency is confirmed, MEMAC assumes the title of the RNCC and the MEMAC duty Officer becomes the RNCT Duty Officer;
- 4) Include the classification level as part of the initial notification process to all other MS; and
- 5) Review the classification level and revise as required. Normally, a review of the classification level occurs every hour, or as required, when significant changes in the situation have occurred.

**Table 1: Classification Levels**

Classification level	Definition
Alert	Abnormal or uncertain situation, including a serious threat that could lead to a radiological hazard to the personnel within the facility or vessel.
Site emergency	Events resulting in a major decrease in the level of protection for those on or near the site. Radiological or nuclear emergency (with localized consequences) limited to the facility site or on-scene that can be managed by facility personnel or on-scene responders.
General Emergency	Actual or substantial risk of a release of radioactive material or radiation exposure that warrants taking urgent protective actions outside the facility, vessel or on-scene area.

END IDENTIFYING PROCEDURE

## 2.3 Notifying

### 2.3.1 Responsibility

Once the RNCT STA, in conjunction with the RNCT Chair, determines the definitive classification level, the notification and activation process must immediately commence (within 30 minutes of classification). Responsibility for initial notification of MS lies with the RNCC, although each MS has an obligation within the scope of an individual response plan to ensure that this process is properly carried out in their own MS. Prior to the activation of the remaining RNCT members:

- The RNCT Duty Officer is responsible for the initial notification to all other MS and other responding organizations once approved by the Chair. See Procedures 1A and 1B in Section 2.3.5;
- The RNCT Duty Officer is responsible for notifying the IAEA for a General Emergency when instructed to do so by the Chair. See procedure 1C in Section 2.3.5; and
- The RNCT Chair approves all notification messages originating from the RNCC.

### 2.3.2 Purpose

Prompt notification will ensure the following:

- Alert all MS and Responding organizations;
- Trigger activation of the responding organizations based on the classification level; and
- Notify the IAEA.

### 2.3.3 Input

The RNCT Duty Officer requires the following information from the reporting MS prior to initiating a formal notification to other MS:

- Confirmed classification level;
- Information about the emergency;
- Instruction from the Duty RNCT Chair to proceed; and
- Level of immediate assistance required from the Lead MS.

### 2.3.4 Output

Once the required information has been received from the reporting MS, the formal notification process will ensure the following:

- Notification message to all other MS; and
- Applicable activation level of RNCT.

### 2.3.5 Notifying Procedure

#### 2.3.5.1 *Notifying Procedure A: Notification of the RNCC*

The formal MS notification process begins with the initial notification to the MEMAC Duty officer by the reporting MS.

- 1) The MEMAC Duty Officer must obtain the following information from the reporting MS. If not provided initially by the reporting MS, the MEMAC Duty Officer should request this information (see contact list in Annex A):
  - a. Name of contact and organization;
  - b. Date and time of the emergency;
  - c. Nature of the emergency;
  - d. Provisional emergency classification (if available); and
  - e. Number where individual can be contacted.
- 2) The MEMAC Duty Officer calls MS contact back to confirm; and
- 3) The MEMAC Duty Officer alerts the Duty RNCT Chair and STA and follows further notification instructions.

#### **2.3.5.2 Notifying Procedure B: Notification of MS and Responding Organizations**

- 1) On instruction from the Duty RNCT Chair, the MEMAC Duty Officer assumes the role of the RNCT Duty Officer and completes the Regional notification form (Appendix 1 to this procedure);
- 2) RNCT Duty Officer obtains authorization for dissemination of notification from Duty RNCT Chair; and
- 3) RNCT Duty Officer sends Regional notification form to all MS contact points and responding organizations selected in the notification form. See contact list in ANNEX A.

#### **2.3.5.3 Notifying Procedure C: Notification of the IAEA**

- 1) On instruction from the RNCT Chair, the RNCT STA completes the IAEA notification form (Appendix 1 to this procedure);
- 2) RNCT Duty Officer obtains authorization from RNCT Chair to carry out the notification of the IAEA;
- 3) RNCT Duty Officer sends IAEA notification form to the IAEA by fax;
- 4) RNCT Duty Officer follows up with email or phone call to the IAEA's Incident and Emergency Centre (IEC). Confirm with the IAEA Duty Officer that the notification message has been received; and
- 5) Prepare and send hourly or bi-hourly updates using the Follow-Up Information form in Appendix 2 to this procedure.

Following the Notification process, the RNCT Chair should expect the following information be passed to the RNCT Duty Officer from MS and Responding Organizations:

- Confirmation of receipt of the notification message from each MS;
- An update on activation levels within each notified MS (Activation levels are determined using the Activation table below, Table 2); and
- Once operational, MS emergency response organizations should inform their RNCT delegate.

END NOTIFYING PROCEDURE

## **2.4 Activating**

### **2.4.1 Responsibility**

The Duty RNCT Chair must assess all of the information provided from the reporting MS and, in consultation with the Duty STA, determine an activation level for the RNCT (activation level should be confirmed within 15 minutes of Classification). Once the required resources and assistance are determined, the RNCT will be activated to a level that is adequate to manage the regional response efforts outside of the OSC controlled zone in International waters, to support the Lead MS when necessary, and to effectively coordinate any additional assets that may be required.

### **2.4.2 Purpose**

Activation is required to ensure that the appropriate response resources are available to effectively manage the response effort or assist in managing the emergency. Based on the definitive classification, resources will be activated at a level that reflects the requirements of the classification level and state of emergency.

### **2.4.3 Input**

- Confirmation of classification level to determine appropriate activation level; and
- Confirmation of notification to all MS.

### **2.4.4 Output**

- The RNCT Chair must ensure the RNCT is activated to a level reflective of the classification level of the emergency.

### **2.4.5 Activating Procedure**

Based on the Classification level declared by the RNCT the RNCT Chair, in consultation with the RNCT, the STA should refer to Table 2 to determine the appropriate Activation level. Based on the Activation level, the RNCT Duty Officer shall:

- Utilize the RNCC recall process to notify all team members of the activation state and the requisite recall requirements.

Following activation of the RNCT team members, the RNCT Chair should expect the following information be passed to the RNCT Duty Officer from MS and RNCT members:

- Confirmation of receipt of the activation notification from each MS and RNCT members;
- Once operational, MS emergency response organizations should inform their RNCT delegate.

Within the MS, the RNCT Chair should be aware that the following will transpire once the activation process has commenced:

- MS will determine the level of activation required for their own response to the emergency;
- Determine the level of support that can be provided to the RNCC response effort (e.g., survey teams, sustainment RNCT Chair, etc.)

Following initialization of the activation process, the following actions should be taken within the RNCC:

- The RNCT Duty Officer will log all confirmations of notifications received by all MS;
- Duty RNCT Chair informs RNCT SOC when organizations have been activated;
- The RNCT Duty Officer keeps a log of activation status and updated contact information; and
- Once able, the RNCT assumes responsibility for the applicable response operations.

**Table 2: MS Activation Levels by classification**

Classification level	Activation level			
	RNCT	Dose assessment team	Survey teams	Other teams
<b>Alert</b>	Status: Standby  <b>Note:</b> RNCC keeps the RNCT team members informed of the situation by email.	Status: Standby  <b>Note:</b> STA keeps the dose assessment team leader informed by email.	Status: Standby	Status: Standby
<b>Site Emergency</b>	Status: Activated but members stay at their location.  <b>Note:</b> Communication amongst members is arranged by the RNCT Chair. Some members of the RNCT may relocate to RNCC, at the discretion of the lead MS, RNCT Chair, and the team member(s), and depending on the specific needs of the situation.	Status: Fully activated  <b>Note:</b> The team starts gathering data on the location of the emergency and the nature of the potential releases.	Status: Fully activated  <b>Note:</b> Teams are dispatched to the scene by the STA.	Status: As required
<b>General Emergency</b>	Status: Fully activated	Status: Fully activated	Status: Fully activated	Status: As required

END OF ACTIVATING PROCEDURE

**APPENDIX 1 TO NOTIFYING PROCEDURE A and B: REGIONAL NOTIFICATION FORM**

Date and time	
From	
Contact information	
Emergency classification	<input type="checkbox"/> Alert <input type="checkbox"/> Site emergency <input type="checkbox"/> General emergency <input type="checkbox"/> Others
Short description of the emergency	
Lead MS	
Assistance requested (if any) <i>Note: Follow up with a complete description of the assistance required and coordination arrangements</i>	
Distribution list	<input type="checkbox"/> Islamic Republic of Iran <input type="checkbox"/> Kingdom of Bahrain <input type="checkbox"/> State of Kuwait <input type="checkbox"/> Sultanate of Oman <input type="checkbox"/> State of Qatar <input type="checkbox"/> Kingdom of Saudi Arabia <input type="checkbox"/> United Arab Emirates <input type="checkbox"/> RNCC <input type="checkbox"/> IAEA <input type="checkbox"/> Dose Assessment Team
	<input type="checkbox"/> Survey teams <input type="checkbox"/> Medical teams <input type="checkbox"/> Hospitals <input type="checkbox"/> Others (Insert details)



**APPENDIX 1 TO NOTIFYING PROCEDURE C: IAEA NOTIFICATION FORM**

To : <input checked="" type="checkbox"/> IAEA (IEC) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> For IAEA use only <input type="checkbox"/> For authority use only <input type="checkbox"/> Free for publication	MESSAGE No. __ <input type="checkbox"/> instantly <input type="checkbox"/> after __ hours
--	--	--

<b>EXERCISE</b>	<b>EMERCON</b>	<b>ADVISORY</b>
-----------------	----------------	-----------------

**BASIC INFORMATION**

1 Reporting STATE: \_\_\_\_\_ Number of pages 1 + \_\_

2 Is this an official Notification under the **Early Notification Convention** of an actual or potential **transboundary** release that is or may be of radiological significance for another State?     Yes     No

3 Competent authority:

Tel: + _____	E-mail: _____
Fax: + _____	URL: _____

Contact person (official position): \_\_\_\_\_

4 NATURE OF EVENT

Event type: Installation type: Emergency class: Other: _____	<b>EVENT CHARACTERISTICS</b> Elevated radiation levels <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Release <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Contamination <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Estimated number of hospitalized casualties: _____
---	---

5 Facility/event location: \_\_\_\_\_ Co-ordinates: latitude (deg·dec) \_\_\_\_·\_\_\_\_°    N S  
 longitude (deg·dec) \_\_\_\_·\_\_\_\_°    E W

6 Date and time of occurrence:    yyyy/mm/dd 20 \_\_/\_\_/\_\_ (24 hour clock) hh:mm \_\_:\_\_ UTC

7 Information VALID at:    yyyy/mm/dd 20 \_\_/\_\_/\_\_ (24 hour clock) hh:mm \_\_:\_\_ UTC

8 SUMMARY DESCRIPTION:

---

9 ACTIONS BEING TAKEN OR PLANNED:

---

10 MEDIA INFORMATION    Provisional INES Rating \_\_    Press release     attached     see web site  
 Media contact tel: + \_\_\_\_\_    URL of public web-site: \_\_\_\_\_

---

11 OTHER RELEVANT INFORMATION:

<input type="checkbox"/> Further information in attachment	<input type="checkbox"/> Final message
<input type="checkbox"/> Further information web:	

EMERCON FORM SRF Ver 1.1f (Dez 2006)

**INSTRUCTIONS FOR COMPLETING EMERCON FORM SRF**  
STANDARD REPORT FORM

The authorized **National Competent Authority for Domestic Emergencies - NCA(D)** completes the EMERCON FORM SRF for faxing **initial information** about any nuclear or radiological emergency (except for a general emergency at a nuclear installation, for which the EMERCON-GENF form should be used). **Do NOT send the initial report by e-mail.**

**Type** all information. For the initial report type the information in the upper blue box of the form (**Basic information**). If the other information is not available, **do not delay faxing the form<sup>1</sup>**; a further message can be sent later when known. **Fields in blue should always be completed.**

**To:** Select/type the States/organizations to whom the completed form will be faxed directly.

Select one of 'for authority use only', 'for IAEA use only' (meaning the IAEA Secretariat) or 'free for publication'. If you select 'free for publication' select 'instantly' - or 'after \_ hours' and enter the number of hours after the date/time information is VALID (see line 7) from when information may be freely distributed.

**MESSAGE No. :** Type the serial number of the message (normally 1 for initial message)

Select either **ADVISORY** (discretionary) or **GS-R-2** (notification of a transnational emergency under para. 4.15 of GS-R-2), as appropriate. Ensure the word **EXERCISE** does not display if this is a real event.

BASIC INFORMATION

**Line 1:** Type (in English) **the State reporting the event**, and the number of pages including any attachments.

**Line 2:** Mark clearly if this is an **official notification/information** under Articles 2/5 of the Early Notification Convention.

**Line 3:** Type the name of the **Competent Authority** reporting the event, the telephone and fax details; the name/position of the person for future contact, e-mail details and the URL of the Competent Authority web site.

**Line 4: NATURE OF EVENT. Event type:** Select from the dropdown list one of "nuclear installation event", "missing dangerous source", "space object re-entry", "elevated radiation levels", "discovered dangerous source", "severe patient overexposure", "transport emergency", "credible threat", or "other (described below)".

If the event type is a "nuclear installation event", enter **installation type** and **emergency class**, as follows:

**Installation type:** Select "NPP" for a nuclear power reactor, or "PWR", "BWR", "AGR", "VVER", "RBMK", "CANDU" if specific type of NPP known, or other type of installation if not an NPP.

**Emergency class:** Select "facility emergency" or "site area emergency" according to the following table (do not use this form for a "general emergency" at a nuclear installation i.e. actual or substantial risk of release of radioactive material or radiation exposure that warrants taking urgent protective actions off the site; rather use the EMERCON-GENF form):

Condition (see Chapter 4 of ENATOM for more details)	Emergency class
Major decrease in level of protection for people on site. Emergencies in this class can never give rise to an off-site threat.	"facility emergency"
Major decrease in level of protection for people on site and near the facility, but not sufficient for 'general emergency'	"site area emergency"

**Other:** Enter the type of facility or event if not listed above.

**EVENT CHARACTERISTICS.** Check boxes to indicate whether radiation levels are significantly higher than normal, whether there has been a release of radioactive material to the environment and whether there is contamination. Provide also an estimate of the number of casualties that have been hospitalized.

**Line 5: Facility/event location:** Provide the name of the facility and/or the name of the nearest town or city. Also provide the standard geographical coordinates of the facility/event. Note that latitude and longitude should be given in degrees and their DECIMAL FRACTION (not in degrees, minutes and seconds).

**Line 6:** Give the date and time (UTC<sup>2</sup>) **the event occurred** or, if a nuclear installation, **the time the emergency class was declared**. Use the 24-hour clock (for example, 21:48).

**Line 7:** Enter the date and time (UTC) for which the information on the form was **valid**.

**Line 8: Summary description.** Provide a brief situation report, preferably in English, on the emergency. Emphasize the facts or events that have happened since any last report was provided. Describe facts or events you judge to be relevant for response. For example: nature of the hazard – whether it is under control (e.g. fire out, source now shielded, etc.); what other problems you anticipate, such as other conventional hazards (e.g. chemical, weather, fire, etc.); whether there is a potential for transboundary impact; health issues – what is the nature of any radiation injuries; what are the doses received; what are the significant results of internal and/or skin contamination; are there any other significant radiation-related health impacts, etc.; radiological data – critical measurements, type of radiation and/or nuclide involved etc.

**Line 9: Actions being taken or planned:** What protective actions such as sheltering, evacuation, traffic restrictions, food restrictions, trade or travel restrictions, have been taken or are planned, and where and on what basis etc.

**Line 10: Media information:** If available, provide the provisional INES rating; if press releases have been issued, indicate whether they are attached or are available on a public web-site. Provide a media contact telephone no. and the URL of any public web site to which press releases are posted.

**Line 11:** Briefly summarize any **other relevant information** that may help the IAEA carry out its functions, or that may be appropriate for other States. Also indicate here any information regarding changes of contact numbers. If you are attaching additional sheets to this form with further information, select 'further information in attachment'. If you have posted information to a web site, enter the URL (and UIDs/passwords if protected). Send any graphical material as jpeg or gif files to eru1@iaea.org by e-mail. If this is the final message regarding the emergency, check the box.

**Do not delay sending this FORM by fax (or as an e-mail attachment if not the initial report) to +43-1-2600729000.**

**Telephone the IAEA emergency number for confirmation of receipt.**

**Provide further information using a new EMERCON SRF form.**

**If an emergency at a nuclear installation escalates to a general emergency use EMERCON form GENF to notify the IEC by fax**

<sup>1</sup> For the full communication procedure, see Attachment I of ENATOM; for information on the IAEA response, see Sections 4.1 and 4.3-4.6 of ENATOM

<sup>2</sup> UTC (Universal Time Co-ordinated) is the same as GMT (Greenwich Mean Time).

**APPENDIX 2 TO NOTIFYING PROCEDURE C: IAEA FOLLOW UP INFORMATION FORM**



To:  IAEA (IEC)     MESSAGE No. \_\_\_  
 For authority use only  Free for publication  Instantly  after \_\_\_ hours

**EXERCISE                      EMERCON                      GENERAL EMERGENCY**

BASIC INFORMATION

1 Notifying STATE: \_\_\_\_\_ Number of pages 1 + \_\_\_

2 Is this an official Notification under the **Early Notification Convention** of an actual or potential **transboundary** release that is or may be of radiological significance for another State?  Yes  No

3 Competent authority:  
 Tel: + \_\_\_\_\_ E-mail: \_\_\_\_\_  
 Fax: + \_\_\_\_\_ URL: \_\_\_\_\_  
 Contact person (official position): \_\_\_\_\_

4 Installation name/location: \_\_\_\_\_ Co-ordinates: latitude (deg·dec) \_\_\_° \_\_\_' \_\_\_"  N  S  
 Installation type: \_\_\_\_\_ longitude (deg·dec) \_\_\_° \_\_\_' \_\_\_"  E  W  
 Normal power: \_\_\_\_\_ MWthermal

5 General Emergency declared at: yyyy/mm/dd 20\_\_/\_\_/\_\_ (24 hour clock) hh:mm \_\_\_:\_\_\_ UTC  
Basis for declaration: \_\_\_\_\_

6 Information VALID at: yyyy/mm/dd 20\_\_/\_\_/\_\_ (24 hour clock) hh:mm \_\_\_:\_\_\_ UTC

7 CRITICALITY                      SEVERE DAMAGE TO FUEL

Continuing                       Unknown                      mm/dd                      hh:mm  
 Stopped on \_\_/\_\_/\_\_ at \_\_\_:\_\_\_ (UTC)  Has not occurred and unlikely to occur  
 Unknown                       Likely to occur on/  Has occurred on \_\_/\_\_/\_\_ at \_\_\_:\_\_\_ UTC

TREND IN PLANT CONDITIONS                      Fuel damage indicated by: \_\_\_\_\_

Getting better                       Stable  
 Getting worse                       Unknown

8 ACTUAL OR PROJECTED RELEASE INFORMATION                      Description of actual or projected release conditions

Unknown  
 Has not occurred and unlikely to occur

Release to atmosphere:                      Actual or projected release times:                      m m / d d                      h h : m m  
 Effective release height                      Start time                      \_\_\_/\_\_\_ \_\_\_:\_\_\_ UTC  
 >1 km                       <1 km                       Unknown                      End time                      \_\_\_/\_\_\_ \_\_\_:\_\_\_ UTC

Release to water:                      Body affected:                      at \_\_/\_\_/\_\_ \_\_\_:\_\_\_ UTC

9 METEOROLOGY at \_\_/\_\_/\_\_ \_\_\_:\_\_\_ UTC

Wind from \_\_\_ degrees                      Forecast:                      Areas likely affected:  
 (e.g. 90 deg. means wind blows from E to W)

Wind speed: \_\_\_ metres/second  
 Pasquill stability class (A-G) \_\_\_  
 Local precipitation:  Yes  No

10 PROTECTIVE ACTIONS ORDERED?                       None until now                       Stable iodine                       Sheltering                       Evacuation

How far?                      \_\_\_ km                      \_\_\_ km                      \_\_\_ km

Others

11 MEDIA INFORMATION                      Provisional INES Rating \_\_\_                      Press release  attached  see web site

Media contact tel: + \_\_\_\_\_ URL of public web-site: \_\_\_\_\_

12 Other relevant information: \_\_\_\_\_

Further information in attachment                       Final message  
 Further information web: \_\_\_\_\_

**INSTRUCTIONS FOR COMPLETING EMERCON FORM GENF**

GENERAL EMERGENCY AT A NUCLEAR INSTALLATION  
(i.e. actual or substantial risk of release of radioactive material or radiation exposure  
that warrants taking urgent protective actions off the site)

The **National Competent Authority for Domestic Emergencies - NCA(D)** completes the EMERCON form GENF for **faxing (do not use email) an initial notification of a general emergency at a nuclear installation or for sending (by fax or email) follow-up information about plant conditions, release to the environment, meteorology or overview of protective actions.**

Type all information. For the initial report type the information in the upper blue box of the form ("**Basic information**"). If the other information is not available, **do not delay faxing the form**<sup>1</sup>; a further message can be sent later. **Fields in blue should always be completed.**

**To:** Select/type the States/organizations to whom the completed form will be faxed directly.

Select one of 'for authority use only' or 'free for publication'. If you select 'free for publication' select 'instantly' or select 'after \_ hours' and enter the number of hours after the date/time information is VALID (see line 6) from when information may be freely distributed.

**MESSAGE No. :** Type the serial number of the message (normally 1 for initial message)

Ensure the header shows the word **EXERCISE** if appropriate - otherwise delete it from the form.

**BASIC INFORMATION**

**Line 1:** Type (in English) the **State notifying the emergency**; and the number of pages.

**Line 2:** Mark clearly if this is an **official notification/information** under Articles 2/5 of the Early Notification Convention.

**Line 3:** Type the name of the **Competent Authority** reporting the event, the telephone and fax details; the name/position of the person for future contact, e-mail details and the URL of the Competent Authority web site.

**Line 4: Installation name/ location:** The name of the nuclear installation and/or the nearest town or city. Also provide the standard geographical co-ordinates of the installation. Note that latitude and longitude should be given in degrees and their DECIMAL FRACTION (not in degrees, minutes and seconds).

**Installation type:** Type "NPP" for a generic nuclear power reactor, or "PWR", "BWR", "AGR", "VVER", "RBMK", "CANDU" if specific type known, or "research reactor", "fuel fabrication", "reprocessing", "waste treatment", "enrichment", "spent fuel pool", "submarine" or "other nuclear installation".

**Normal power:** If the installation is a reactor, type the normal power in Megawatt (thermal)

**Line 5:** Give the date and time (UTC<sup>2</sup>) at which **general emergency was declared**. Use the 24-hour clock (e.g. 21:48). Provide the key **basis for declaring general emergency** (for example, failure to scram and water level below top of fuel; primary system leak and insufficient water injection; projected loss of AC/DC power for more than 45 mins; radiation levels > 10 mSv/h in control room; dose rates > 1 mSv/h measured off site etc.)

**Line 6:** Enter the date and time (UTC) for which the information on the form was valid.

**Line 7: Installation conditions Criticality:** Indicate, as appropriate, whether any chain reaction is continuing or, if it has been stopped, when. This applies for shutdown of reactors and any unplanned criticalities. **Trend in plant conditions:** indicate whether plant conditions are generally improving, worsening or stable. **Severe damage to fuel:** For reactors or spent fuel pools, indicate whether severe damage to fuel has occurred or is likely to occur, and if so, when. **Fuel damage indicated by:** describe what symptoms indicate fuel damage (e.g. temperature of fuel > 750°C, containment radiation levels > 5 Gy/h, core estimated to be uncovered for more than 30 minutes).

**Line 8: Actual or projected release information:** Indicate whether there has yet been a release to atmosphere or water. For an **atmospheric release** indicate the effective release height, and the actual or projected date/times (UTC) of the start and end of the release (a time of release before or after the time of validity - line 6 - will be interpreted as an actual or projected release time respectively). For a release to water, name the water body affected and the date and time of the release (UTC). **Description of actual or projected release conditions:** Describe the conditions that can affect the likelihood, magnitude and/or nature of the release (e.g. containment leakage rate = 2% per hour, expect sprays to operate, actual containment by-pass; expected ice condenser functioning; filters have failed).

**Line 9: Meteorology:** Provide the date/time (UTC) for which the meteorology data apply. Provide the wind direction as an angle in degrees clockwise from North for the direction from which the wind is blowing (for example: 90 degrees means the wind is blowing from east to west). Provide the wind speed in metres/second and the Pasquill stability class, if known. Indicate whether there is local precipitation. **Forecast:** Describe the expected changes in meteorological conditions that could be important with respect to any transboundary impact (e.g. expected major shifts in wind direction and speed, expected rain or frontal system). **Areas likely affected:** Describe those areas (regions, States etc.) where doses or levels of contamination could exceed international intervention levels for protective actions, including food restrictions (e.g. >100 Bq/L of I131 in milk or > 1000 Bq/L of Cs137 on foods destined for general consumption) and restrictions on commerce.

**Line 10: Protective actions ordered:** Indicate the protective actions ordered (including those taken) and the approximate distance to which they have been ordered. Indicate if any other significant protective actions have been ordered and briefly describe them (e.g. major airport or shipping lane closed)

**Line 11: Media information:** If available, provide the provisional INES rating; if press releases have been issued, indicate whether they are attached or are available on a public web site. Provide a media contact telephone no. and the URL of the public web site to which press releases are posted.

**Line 12:** Briefly summarize any **other relevant information** that may help the IAEA carry out its functions, or that may be appropriate for other States (e.g. assumed or established cause and foreseeable development of the emergency; characteristics of any radioactive release, including probable physical and chemical form, composition and quantity; predicted behaviour over time of any release, foreseeable or actual termination of the emergency). Also indicate here any information regarding changes of contact numbers. If you are attaching additional sheets to this form with further information, select 'further information in attachment'. If you have posted information to a web site, enter the URL (and UIDs/passwords if protected). Send any graphical material as jpeg or gif files to eru1@iaea.org by e-mail. Provide additional detailed information on off-site radiation measurements and protective actions on EMERCON form MPA.

Send any information that is 'in confidence with the IAEA' separately, marked 'CONFIDENTIAL'.

**Send FORM GENF by fax (or an e-mail attachment if not the initial notification of a general emergency or of a significant transboundary release under the Early Notification Convention) to the IAEA IEC.**

**Telephone for confirmation of receipt** using any dedicated contact details supplied to you by the IEC on its activation.

**If unsuccessful, fax this form to +43-1-2600729000 or e-mail to eru1@iaea.org and telephone +43-1-2632000 or 2632012 for confirmation of receipt.**

<sup>1</sup> For the full communication procedure, see Attachment I of ENATOM, for information on the IAEA response, see Section 4.2 of ENATOM  
<sup>2</sup> UTC (Universal Time Co-ordinated) is the same as GMT (Greenwich Mean Time).

To:  IAEA (IEC)

For IAEA use only  For authority use only  Free for publication

MESSAGE No. \_\_

instantly  after \_\_ hours

**EXERCISE** **EMERCON** **ADVISORY**

1 Reporting STATE: \_\_\_\_\_ Number of pages 1 + \_\_

2 Competent authority:

Tel: + \_\_\_\_\_ E-mail: \_\_\_\_\_

Fax: + \_\_\_\_\_ URL: \_\_\_\_\_

Contact person (official position): \_\_\_\_\_

3 Principal actual (not predicted) OFF-SITE MEASUREMENTS

Type of measurement (dose rate, air, surface, or other)	Isotope (if known)	Measured Value and Unit (SI)	Date and Time of Measurement (UTC)	Location (either co-ordinate system)		Distance (km) and direction
				Latitude (deg.dec) Longitude (deg.dec)		
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °
			20 __/__/__ : :	°. ° ° °	<input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W	___. __ km °

4 OFF-SITE PROTECTIVE ACTIONS

Protective Action	Status	Maximum distance	Remarks
Stable iodine		___. __ km	
Sheltering		___. __ km	
Evacuation		___. __ km	
Food restrictions /advisories		___. __ km	
Traffic restrictions (road, water, air, rail)		___. __ km	
Other actions (travel advice, trade issues, embassies, etc.)		___. __ km	

Information VALID as at: \_\_\_\_\_ / \_\_\_\_ / \_\_\_\_ (24 hour clock) hh:mm : \_\_\_\_ UTC

Further information in attachment  Final message

Further information web:

EMERCON FORM MPA Ver 2.1f (Dec 2006)

**INSTRUCTIONS FOR COMPLETING EMERCON FORM MPA  
MEASUREMENTS AND PROTECTIVE ACTIONS**

The **National Competent Authority for Domestic Emergencies NCA(D)** of a reporting/notifying State (OR on request the National Competent Authority for Emergencies Abroad NCA(A) of an affected State) completes the EMERCON FORM MPA to provide **more specific information** about principal off-site measurements and protective actions (planned or taken) during a nuclear or radiological emergency.

**Type** all information. **Even if not all the details are known - do not unnecessarily delay sending this form<sup>1</sup>.** Additional information can be sent in a further message later when known. **Fields in blue should always be completed.**

**To:** Select/type the States/organizations to whom the completed form will be faxed directly.

Select one of 'for authority use only', 'for IAEA use only' (meaning the IAEA Secretariat) or 'free for publication'. If you select 'free for publication' select 'instantly' or select 'after \_ hours' and enter the number of hours after the date/time information is VALID (at bottom of form) from when information may be freely distributed.

**MESSAGE No. :** Type the serial number of the message.

Ensure the header shows only the word **ADVISORY** (discretionary) or **GS-R-2** (transnational emergency) as appropriate, and has the word **EXERCISE**, if appropriate. Delete the words that are not applicable.

**Line 1:** Type (in English) **the State reporting the emergency**; and the number of pages.

**Line 2:** Type the name of the **Competent Authority** reporting the event, the telephone and fax details; the name/position of the person for future contact, e-mail details, and the URL of the Competent Authority web site.

**Line 3: Principal actual (not predicted) off-site measurements.** Type the type and the values of the main measurements taken. Note that the values should be derived from actual measurements and **not the results of computer model predictions**. Indicate levels of radiation or of contamination measured in the environment that help other States appreciate the seriousness of the emergency. Enter the type of measurement as "dose rate", "air", "surface", "milk", "grass" or "other" and if "other", briefly describe the type below. If known, type the name of the measured isotope (e.g. Kr-88, Sr-90, Ru-106, Xe-133, I-131, I-135, Te-132, Cs-134, Cs-137, Ba-140, Pu-241), focusing on providing information on isotopes that are radiologically significant. Give the value of the measurement(s) in SI units (e.g., dose rate in milliSv/h, microSv/h surface contamination in Bq/m<sup>2</sup>, air sample in Bq/m<sup>3</sup> or another concentration in Bq/L or Bq/kg [fresh weight]). Type the date, time (in UTC<sup>2</sup> using the 24-hour clock); and location corresponding to each value using either geographic co-ordinates (latitude and longitude in degrees with DECIMAL FRACTIONS - do **not** use minutes and seconds of arc) or distance and direction (e.g. 4km NE) from the site of the emergency. **Extend the table with rows as necessary.** Do not send comprehensive and detailed measurement information, which may be made available from a web server.

Example:

Type of measurement (dose rate, surface, air or other)	Isotope (if known)	Value Measured and Unit (in SI)	Date and Time of Measurement (UTC)	Location
Dose rate	-	6 milliSv/h	2003-07-01 14:56	3 km, 45°
Surface	Cs-134	2000 Bq/m <sup>2</sup>	2003-07-01 18:32	6 km, 270°
Grass	I-131	6000 Bq/kg	2003-07-02 11:07	20.6° N, 16.7° E

**Line 4: Off-site protective actions.** Give the **status** of any protective action(s) (i.e., whether they have been "taken fully", "taken partially", "ordered" or "planned"); and to what distance (in kilometres) from the site of the emergency. Under remarks provide other useful details about the decision or degree of implementation; describe briefly the reason(s) or the criteria for the respective protective action (e.g., "declaration of General Emergency" or "I-131 concentration in milk > 100 Bq/L"). If appropriate and available, give the approximate number of people affected by the protective action. **Information VALID as at:** Enter the time at which the information on protective actions was valid. Use the 24-hour clock and UTC.

If you are attaching additional sheets to this form with further information, select 'further information in attachment'. If you have posted information to a web site, enter the URL (and UIDs/passwords if protected). You can also send any graphical material as jpeg or gif files to eru1@iaea.org by e-mail.

**Send FORM MPA by fax or as an e-mail attachment to the IAEA IEC.**

**Telephone for confirmation of receipt**  
using any dedicated contact details already supplied to you by the IEC on its activation.

**If unsuccessful, fax this form to +43-1-2600729000 or e-mail to eru1@iaea.org and**  
telephone +43-1-2632000 or 2632012 for confirmation of receipt

<sup>1</sup> For the full communication procedure, see Attachment I of ENATOM, for information on the IAEA response, see Sections 4.1 - 4.6 of ENATOM

<sup>2</sup> UTC (Universal Time Co-ordinated) is the same as GMT (Greenwich Mean Time).

### **3. GENERAL PROCEDURES FOR THE RNCT CHAIR**

---

#### **3.1 Responsibility**

The RNCT Chair has the responsibility to ensure the proper and effective management of the response operations and mitigation efforts of the RNCT. This responsibility is administered through the completion and implementation of the 'Immediate Actions' and 'Ongoing Actions' procedures below.

#### **3.2 Purpose**

- Guide the RNCT Chair in the execution of all immediate and ongoing tasks during an emergency.

#### **3.3 Input**

- Any information about the emergency provided from the reporting MS, supporting MS and notified responding organizations.

#### **3.4 Output**

- Decisions and actions that ensure the proper management of the emergency operations process.

#### **3.5 Procedure**

Until the RNCT is fully activated and an RNCT Chair is appointed by the MS delegates, the RNCC will ensure that a Duty RNCT Chair is available to assume the lead during the initial stages of the response effort. Once activated, the MS delegates will decide on and appoint the most suitable representative to act as the RNCT Chair. Generally, the representative from the Lead MS will assume and maintain the position of the RNCT Chair, depending on the state of the emergency and response effort. Until an RNCT Chair is appointed, the Duty RNCT Chair will lead the RNCT effort.

General procedures for the RNCT Chair will fall into one of two categories, Immediate Actions or Ongoing Actions, as described below.

##### **3.5.1 Immediate actions**

- 1) Decide on and confirm the classification (30 minutes) and activation level of the RNCT;
- 2) Initiate notification and activation of the RNCT. Specify meeting location if different from MEMAC;
- 3) Initiate notification and activation of RNCT Ops personnel (on-call MEMAC Ops personnel) within 15 minutes of confirmation of an event;
- 4) Start a personal log;
- 5) Establish liaison with Lead MS;
- 6) If a Lead MS has not yet been designated, coordinate with affected (i.e., closest MS) or relevant MS to appoint a Lead MS;
- 7) Establish schedule for RNCT (see Appendix 1 of this procedure for standard crisis management cycle);
- 8) Notify and make recommendations to other MS as appropriate;
- 9) Inform MS and notified responding organizations of the crisis management cycle timings;
- 10) Prepare and give initial briefing to RNCT;
- 11) Establish management priorities; and

- 12) Announce time of next meeting and confirm meeting format for efficient facilitation.

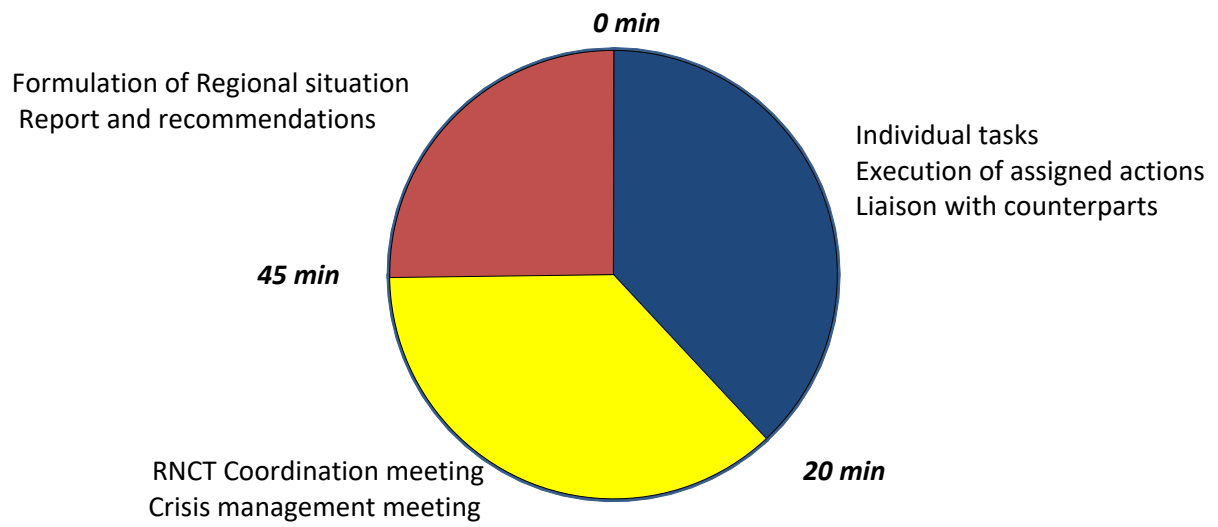
### **3.5.2 Ongoing actions**

- 1) Conduct regular meetings (see Appendix 2 to this procedure for guidelines on conducting crisis management meetings);
- 2) Maintain regular liaison with the Lead MS;
- 3) Evaluate situation and prepare regular situation reports for the MS and the Responding Organizations (see Appendix 3 to this procedure);
- 4) Manage all activities of the RNCT;
- 5) Ensure all concerns from the MS are addressed, answered and properly tracked;
- 6) Manage human resources:
  - a. Determine if additional members are required;
  - b. Arrange for additional shifts if work is expected to last for more than 10 continuous hours; and
  - c. Monitor degree of fatigue of delegates and staff and, if required, enforce rest periods; and
- 7) Monitor the situation and the needs of the MS involved in the management of the emergency.

END GENERAL PROCEDURE FOR THE RNCT CHAIR



### APPENDIX 1 TO RNCT CHAIR PROCEDURE: STANDARD CRISIS MANAGEMENT CYCLE (Example)



## **APPENDIX 2 TO RNCT CHAIR PROCEDURE: GUIDELINES FOR CONDUCTING CRISIS MANAGEMENT MEETINGS**

- 1) THINK STRATEGIC. Ensure that the discussions stay focused on the critical issues that remain unresolved. Detailed issues of a lesser significance should be debated after the meeting;
- 2) Declare the meeting open;
- 3) Explain the meeting rules and format:
  - a. Confirm time available;
  - b. Indicate that discussions will be limited in time and scope; and
  - c. Identify issues here, resolve them after the meeting;
- 4) Allow 1 or 2 minutes for each delegate attending the meeting to give an initial briefing. Ensure that issues are identified and recorded but NOT DISCUSSED in the meeting. Give direction for side meetings to resolve issues and ask that the resolution be reported at the next meeting (stick to the crisis management cycle);
- 5) State each new action and decision clearly for recording;
- 6) Clearly assign responsibility for any action;
- 7) Review previous actions;
- 8) Summarize issues, actions and recommendations; and
- 9) Adjourn the meeting, and confirm the next meeting time.

### APPENDIX 3 TO RNCT CHAIR PROCEDURE: MS SITUATION REPORT FORMAT

<b>Time:</b>	
<b>From</b>	
<b>Situation:</b>	<i>Give a briefing on the key information related to changes that happened since the last report.</i>
<b>Prognosis</b>	<u>Most likely</u> <i>Describe the most likely impact.</i>
	<u>Worst case</u> <input type="checkbox"/> Likely <input type="checkbox"/> Not likely <input type="checkbox"/> Almost impossible <i>Describe the worst case scenario, and specify if this is a likely, not likely or almost impossible scenario by checking the appropriate box.</i>
<b>Actions:</b>	<i>Give a brief list of the key actions that you have taken since the last report. Only include details that are relevant to the audience. BE STRATEGIC.</i>
<b>Immediate issues:</b>	<i>Give a list and explanation of the most urgent issues that need to be resolved. Do not include issues that are internal to your group unless you cannot resolve them and unless they have an impact on the audience. BE STRATEGIC.</i>
<b>Longer-term issues</b>	<i>Same as above, but these are the issues that are less important at the moment. BE STRATEGIC.</i>
<b>Recommendations</b>	<i>This is your overall assessment of the situation and the recommendations that you are making to your audience.</i>
<b>Attachment</b>	<i>As required:</i> <ul style="list-style-type: none"><li><input type="checkbox"/> <i>Plume trajectory</i></li><li><input type="checkbox"/> <i>Weather predictions for the next 48 hours</i></li><li><input type="checkbox"/> <i>Dose projections</i></li><li><input type="checkbox"/> <i>Dose rate and contamination maps</i></li></ul>

## **4. GENERAL PROCEDURES FOR THE RNCT DELEGATES**

---

### **4.1 Responsibility**

RNCT delegates are responsible for communicating information regarding the emergency to each respective MS. Delegates are also required to coordinate additional resources from respective MS to support the response effort as requested by the RNCT Chair. This responsibility is administered through the completion and implementation of the 'Immediate Actions' and 'Ongoing Actions' procedures below.

### **4.2 Purpose**

- Guide the delegates of the RNCT in the execution of their immediate and ongoing tasks during an emergency.

### **4.3 Input**

- Any information about the emergency provided from the reporting MS, supporting MS and responding organizations as briefed by the RNCT Chair.

### **4.4 Output**

- Decisions regarding support assets and resources, on behalf of each respective MS, that ensure the proper management of the emergency operations processes; and
- Managing all logistical requirements associated with the request for support.

### **4.5 Procedure**

General procedures for the RNCT members will fall into one of two categories: Immediate Actions or Ongoing Actions, as described below.

#### **4.5.1 Immediate actions**

- 1) Start a personal log;
- 2) Confirm the activation status of respective national emergency organization. Note that not all situations require activation, but as a precautionary measure, each national contact point should be identified and acknowledged for an efficient coordinated effort, should it be required;
- 3) In a GENERAL EMERGENCY, or if requested by the RNCT Chair during a SITE EMERGENCY, go to the RNCC location unless otherwise directed;
- 4) Establish a liaison with respective national contact point;
- 5) Confirm available resources from respective MS based on emergency classification;
- 6) Prepare initial briefing for first crisis management meeting; and
- 7) Keep the RNCT Chair informed of each respective national emergency organization activation status.

#### **4.5.2 Ongoing actions**

- 1) Prepare briefings before each RNCT meeting (see Appendix 1 to this procedure for situation report format);
- 2) Maintain regular liaison with respective national contact point;
- 3) Ensure all actions associated with respective MS are tracked and be ready to report details at

every meeting;

- 4) As required, coordinate all available resources when requested by RNCT Chair;
- 5) If required, delegate will coordinate available support from respective MS; and
- 6) Arrange for replacement if work is expected to last for more than 10 continuous hours, or as directed by the RNCT Chair.

END GENERAL PROCEDURE FOR RNCT DELEGATES

## APPENDIX 1 TO PROCEDURE FOR RNCT DELEGATES: RNCT DELEGATE SITUATION REPORT FORMAT

<b>Time:</b>	
<b>From</b>	
<b>Situation:</b>	<i>Give a briefing on the key information related to changes that happened since the last report.</i>
<b>Prognosis</b>	<u>Most likely</u> <i>Describe the most likely impact.</i>
	<u>Worst case</u> <input type="checkbox"/> Likely <input type="checkbox"/> Not likely <input type="checkbox"/> Almost impossible <i>Describe the worst case scenario, and specify if this is a likely, not likely or almost impossible scenario by checking the appropriate box.</i>
<b>Actions:</b>	<i>Give a brief list of the key actions that you have taken since the last report. Only include details that are relevant to the audience. BE STRATEGIC.</i>
<b>Immediate issues:</b>	<i>Give a list and explanation of the most urgent issues that need to be resolved. Do not include issues that are internal to your group unless you cannot resolve them and unless they have an impact on the audience. BE STRATEGIC.</i>
<b>Longer-term issues</b>	<i>Same as above, but these are the issues that are less important at the moment. BE STRATEGIC.</i>
<b>Recommendations</b>	<i>This is your overall assessment of the situation and the recommendations that you are making to your audience.</i>

## **5. GENERAL PROCEDURES FOR THE SENIOR TECHNICAL ADVISOR**

---

### **5.1 Responsibility**

The Senior Technical Advisor (STA) is responsible for providing detailed technical advice and support to the RNCT Chair, as well as MS that may be affected by the emergency.

### **5.2 Purpose**

- Guide the STA in the execution of any immediate and ongoing tasks during an emergency.

### **5.3 Input**

In order to effectively assess the situation from a technical perspective, the following information is required by the STA:

- Information about the emergency, including all available technical information from the Lead MS STA;
- Survey data from Lead MS teams in the affected area;
- Additional survey data from supporting MS;
- Dose projections from Lead MS;
- Initial plume tracking from Lead MS; and
- Plume modeling from WMO.

### **5.4 Output**

- Survey strategy;
- Conduct of survey operations for non-Lead MS survey teams downwind of the emergency;
- Recommendations for protective actions (short and longer term) to all MS;
- Recommendation for emergency workers' protective posture; and
- Recommendations for mitigation.

### **5.5 Procedure**

The MEMAC will ensure that a Duty RNCT STA is available and on-call to assist the Duty RNCT Chair during the initial stages of response. The Lead MS may decide to send a STA to the RNCC to work with the appointed RNCT Chair who would then either lead, assist or replace the Duty RNCT STA.

General procedures for the STA consist of Immediate Actions and Ongoing Actions, as described below.

#### **5.5.1 Immediate actions**

- 1) Start a personal log;
- 2) Confirm the activation status of the RNCC dose assessment team, meteorological team and survey teams;
- 3) Initiate contact with the STA from the Lead MS EOC. Obtain all of the technical information and situational awareness available;
- 4) If this is a GENERAL EMERGENCY, contact the IAEA and initiate the plume tracking protocol (see detailed procedure below). The STA may instruct the RNCT Duty officer to contact the IAEA;
- 5) Update the RNCT Chair; and

- 6) Prepare initial briefing for first crisis management meeting.

### 5.5.2 Plume tracking

Contact the IAEA IEC by email or phone requesting plume tracking to be initiated by World Meteorological Organization (WMO).

- 1) If this request is the first contact established with the IAEA, ensure that the request is done by fax using the IAEA form in Appendix 2 to this procedure. Once the IAEA has been notified, further communications can be conducted via email;
- 2) Fax number: +43 1 2600 729 000;
- 3) Email: [eru1@iaea.org](mailto:eru1@iaea.org);
- 4) Telephone: +43 1 2632 2000; and
- 5) Ensure a return email address or telephone/fax number is provided for receipt of the WMO products.

### 5.5.3 On-scene surveys

- 1) On-site surveys (In-team) are the responsibility of the Lead MS. The RNCT STA shall make every effort to obtain information regarding the emergency directly from the MS STA, so that off-site survey strategy is appropriate to the emergency. Should the response effort continue for more than a few hours, the Lead MS may approach the RNCT to coordinate relief efforts as required;
- 2) The RNCT will be responsible for Off-site (Out-teams) response efforts. The Out-Team will survey downwind in the following manner:
  - a. Position itself downwind at approximately 400 m;
  - b. Sample the air and measure gamma radiation levels;
  - c. Reports the results back to the STA for analysis and guidance; and
  - d. If airborne contamination is detected, STA to provide advice on protective measures;
- 3) The STA must ensure that the Out-Teams have appropriate equipment (e.g., contamination probes, decontamination equipment, etc.), and are capable of providing assistance with the survey of personnel contamination; and
- 4) For detailed guidance on workers protective measures, see procedures on emergency worker protection (Section 7 below).

### 5.5.4 Wide area surveys

When WMO products are made available, the STA must obtain the plume tracking projections and:

- Consider the location of fixed monitors and respective readings;
- Determine if there are major areas where survey data is required but not available;
- Dispatch survey teams to cover areas that require survey data readings;
- Have survey teams take and measure airborne samples;
- Have survey teams take gamma dose rate measurements;
- Ensure all measurements are reported back to STA; and
- Generate a map of the measured dose rates and airborne contamination levels.

For detailed guidance on how to assess these levels, refer to Sections 5.5.6, 5.5.7, Table 4 and Table 5 of Appendix 1 of this procedure.

### 5.5.5 Dose projection

- 1) Ensure that the dose projection team is ready. The STA will be required to provide the dose projection team with the following information:
  - a. Type of emergency;



- b. Source term, if known;
  - c. Whether there has been a release: yes or no;
  - d. Expected release duration (e.g., 2 hours); and
  - e. Measured radiation levels and airborne contamination;
- 2) The dose projection team will analyze the data using Procedure 8; and
  - 3) Use the data to formulate recommendations for public and worker protection actions (see Sections 5.5.6 and 5.5.7 below).

### 5.5.6 Making recommendations for protective actions for the public

Using Table 3, determine the corresponding recommendation based on the most appropriate method.

**Table 3: Recommendations for Protective Actions for the public**

Situation	Criteria	Remark
<ul style="list-style-type: none"> <li>▪ Reactor emergency with core damage</li> <li>▪ In the plume</li> </ul>	OILs >1 mSv/h: evacuation 0.1-1 mSv/h: sheltering and iodine prophylaxis	Take into account the trend and results of the dose projections.
<ul style="list-style-type: none"> <li>▪ Reactor emergency with core damage</li> <li>▪ No plume</li> <li>▪ Ground contamination present</li> </ul>	OILs >1 mSv/h: evacuation > 0.2 mSv/h: consider relocation > 1 μSv/h: restrict consumption of contaminated food and milk	Consider revising the OILs based on an analysis of the isotopic composition of the deposition. Consider aerial survey to quickly identify contaminated areas.
<ul style="list-style-type: none"> <li>▪ Reactor emergency</li> <li>▪ NO core damage</li> </ul>	OILs 10 mSv/h: evacuation	
<ul style="list-style-type: none"> <li>▪ Any emergency, before the plume has reached the area</li> </ul>	Dose projection and intervention levels (see Annex D)	Dose projections should be calibrated to take into account available dose rate and deposition data.
<ul style="list-style-type: none"> <li>▪ NON-reactor emergency</li> <li>▪ Isotope(s) unknown</li> <li>▪ Dispersion</li> </ul>	OIL Measurements > 10 times normal background (and sustained): evacuation or substantial sheltering	If the isotope is known, go to the next line.
<ul style="list-style-type: none"> <li>▪ NON-reactor emergency</li> <li>▪ Isotope(s) known</li> </ul>	Dose estimation from the dose projection team compared to intervention levels (see App. 1)	

### 5.5.7 Making recommendations for the protection of workers

- 1) Determine the most appropriate emergency worker protection strategy based on the guidance contained in Section 8, Protection of Emergency Workers;
- 2) Communicate this strategy to the RNCT OSC and the RNCT as part of the regular briefing; and
- 3) Immediately notify the OSC and RNCT of changes in protective posture requirements.

END GENERAL PROCEDURE FOR THE RNCT STA

**APPENDIX 1 TO PROCEDURE FOR THE STA: INTERVENTION AND ACTION LEVELS**

**Table 4: Protective action intervention levels**

Protective action	Generic intervention level
Sheltering	10 mSv
Evacuation	50 mSv
Iodine prophylaxis	100 mGy
Temporary relocation	Initiate at 30 mSv in 30 days <sup>1</sup> Terminate at 10 mSv in 30 days <sup>2</sup>
Permanent resettlement	1 Sv in lifetime

**Table 5: Action levels for restricting contaminated food**

RADIONUCLIDES IN FOODS DESTINED FOR GENERAL CONSUMPTION	kBq/kg
Cs-134, Cs-137, I-131, Ru-103, Ru-106, Sr-89	1
Sr-90	0.1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0.01
RADIONUCLIDES IN MILK, INFANT FOODS AND DRINKING WATER	kBq/kg
Cs-134, Cs-137, Ru-103, Ru-106, Sr-89	1
I-131, Sr-90	0.1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0.001

<sup>1</sup> If the dose accumulated in a month is not expected to fall below this level in a year or two, permanent resettlement should be considered.

<sup>2</sup> Provided the total life time dose to any member of the population will be less than 1 Sv.

## **6. GENERAL PROCEDURES FOR ON-SCENE RESPONSE**

---

### **6.1 Responsibility**

All emergency response teams that are present at the scene are responsible for the general procedures for on-scene response outlined in this section. The RNCT Chair, STA and all MS delegates should be aware of the expected actions from first responder's on-scene in order to ensure proper emergency management is achieved. As there is no certainty to the order upon which response teams arrive, the dynamic and unpredictable nature of a RN emergency dictates a common approach by all response teams. Unless otherwise indicated, all steps outlined in the general procedures may be followed by any team that takes the lead role. Variables, such as capabilities, authorities, degree of expertise and equipment available, may impact the degree to which a responding organization takes action.

The first response organization at the scene normally assumes the role of On-Scene Controller (OSC). This may change as other services arrive at the scene, or as directed by the competent authorities (Lead MS or RNCT, depending on the situation). Once the RNCT is formally stood up and effectively functioning for an emergency in international waters, the response effort, excluding assets already on-scene and under the direction of the Lead MS, will be directed by the RNCT. The procedures described below are for information only. The Lead MS should have plans that reflect the content in this procedure.

### **6.2 Purpose**

Once on-scene, first responders are required to follow these general procedures in an effort to:

- Control the scene and effectively mitigate the impact of the emergency;
- Rescue victims and ensure that appropriate medical attention is made available;
- Take urgent protective actions in the immediate area of the scene; and
- Preserve the integrity of the scene in cases involving suspected terrorist or criminal actions.

### **6.3 Input**

- Information and confirmation that an emergency with the possible presence of radioactivity has occurred.

### **6.4 Output**

- On-scene actions that control and mitigate; and
- Continuous communication of on-scene information to the RNCT OSC for effective decision making.

### **6.5 Procedure**

#### **6.5.1 Upon Arrival**

- 1) The first senior responder to arrive on-scene assumes the role of the OSC until relieved by another qualified individual;
- 2) Upon arrival, OSC will assess the situation. Observations will be made from a safe distance (initially 400 m) to check for:
  - a. Presence of radiation, radiation placards or other markings;
  - b. Possible hazards to responders;

- c. Presence of victims; and
  - d. Security concerns: armed individuals, terrorist activity;
- 3) A command post will be established upwind and away from any smoke. All responding teams will report to the command post; and
  - 4) If it is a transport emergency, attempts should be made to obtain the shipping papers (the manifest), from the shipper or by contacting MEMAC (for marine vessels).

### 6.5.2 Safety Measures

The following safety measures should be taken on-scene:

- 1) All response personnel must have appropriate protective posture in accordance with Section 8;
- 2) A safety perimeter should be established as shown in Table 6;

**Table 6: Safety perimeter guidelines**

Situation	Safety radius
Unshielded dangerous radioactive source	30 m
Major spill of radioactive material	Spill area plus 100 m
Fire, explosion or fumes	300 m
Suspected dirty bomb	400 m

- 3) Evacuation of people within the safety perimeter and inside the security perimeter until everyone has been checked for contamination and registered:
  - a. Register name and contact information of victims;
  - b. Victims or people at the scene must be controlled for contamination and decontaminated if required (and if time permits in the case of severely injured victims) before leaving the area;
  - c. The public must be searched for weapons, etc., before registration, medical transport, decontamination or otherwise leaving the scene; and
  - d. The fire must be fought from a safe distance.
- 4) Safety perimeter should be adjusted based on survey results:
  - a. If dose rates are greater than 100  $\mu\text{Sv/h}$ , expand the perimeter;
  - b. If airborne contamination is detected, expand the perimeter; and
  - c. If surface contamination over 1000  $\text{Bq/m}^2$  beta/gamma or over 100  $\text{Bq/cm}^2$  or alpha is detected, expand the perimeter;
- 5) OSC should be in communication with the Lead MS STA to discuss if public protective actions outside the safety perimeter are required; and
- 6) Reroute traffic, if necessary.

### 6.5.3 Security Measures

- 1) If criminal/terrorist activity is suspected, the scene will be treated as a crime scene and the use of mobile phones and radio communications will be avoided until it is confirmed by the appropriate investigative authority that the scene has been searched and cleared of explosives, traps and secondary devices;
- 2) A security perimeter will be established (outer cordoned area boundary as determined by appropriate security (i.e., police) forces);
- 3) Entry into the site will be limited to response personnel only;
- 4) Security will be provided if perpetrators may be among the public where interaction with the public is required (public processing/registration, monitoring/decontamination and triage/first aid areas); and

- 5) Security forces will have to consider the possibility of a secondary event (e.g. Improvised Explosive Device (IEDs)).

#### **6.5.4 Casualty Management**

- 1) Responders will search for and rescue victims;
- 2) A contamination control and decontamination centre will be setup inside the security perimeter, but outside the safety perimeter, in an area with close to normal radioactive background; and
- 3) For mass causality emergencies, a triage/first aid area will be established outside the safety perimeter but inside the security perimeter.

#### **6.5.5 Standard Procedures**

- 1) Responders are required to keep respective chain of command (OSC) informed. Make periodic situation reports at a time agreed upon with them;
- 2) Responders will not attempt recovery (non urgent actions) or decontamination of the scene until advised by OSC, in consultation with the Lead MS STA;
- 3) A media reception centre will be established (if required) and there may be a request for media specialist support to manage that centre; and
- 4) OSC must ensure good coordination between all response teams at the scene.

END ON-SCENE RESPONSE PROCEDURE

## **7. CASUALTY MANAGEMENT PROCEDURES**

---

### **7.1 Responsibility**

It is the responsibility of the RNCC to ensure that all organizations involved in the handling, transport and treatment of the victims from emergencies in international waters have all of the necessary information to ensure effective casualty management. Casualties that result from an emergency within a MS will be handled in accordance with the MS national response plan and request for assistance from the RNCC will be as required.

### **7.2 Purpose**

- Standardized procedures to ensure the proper management of victims will:
  - Victims are effectively treated and decontaminated as required;
  - Ensure that victims are transported to a qualified hospital;
  - Ensure that the receiving hospitals have all of the requisite information prior to the arrival of the casualty; and
  - Ensure proper tracking of all casualties.

### **7.3 Input**

- Information about the possible presence of radioactive contamination (i.e., isotope, dose, etc.);
- Knowledge of surrounding medical facilities throughout the region that are equipped to accept casualties of varying injuries and possible contamination; and
- Information about the casualties and sustained injuries.

### **7.4 Output**

- Information for first responders on suitable facilities to transport contaminated casualties, if required and not made available through the OSC; and
- Information regarding the emergency and victims to the receiving hospitals.

### **7.5 Procedure**

Although not required, in cases where there are mass casualties, the RNCT Chair can request a medical representative from the Lead MS and supporting MS to serve as a liaison to assist in casualty management and tracking. When a medical liaison is not made available, casualty tracking would be managed by the logistics and administrative divisions within the RNCT.

On-scene response to casualties will fall under the direction of the OSC. Information regarding the condition of casualties, respective injuries and contamination will be communicated by OSC to the Lead MS STA. Should the casualties require transport to a medical facility, OSC should already have an inventory of facilities that are capable of handling the exposed or contaminated casualties requiring medical attention. In cases where casualties require transport to another facility, the following procedures should be followed:

- 1) Unless otherwise instructed by OSC, first responders will transport the casualties to the nearest medical facility capable of treating the casualties;
- 2) Casualties will be decontaminated before transport, with the exception of critical patients requiring immediate transport to hospital. In the event of transport prior to decontamination,

the receiving hospital must be notified that a contaminated patient is en-route and all steps must be taken to minimize spread of contamination. If the contamination state is unknown but there is a possibility of contamination, assume the victims are contaminated. If assumed or known contamination, take the following steps:

- a. Wrap the victim inside a clean sheet;
  - b. Transfer the victim, in the sheet, to a clean stretcher, taking care of not contaminating the clean stretcher;
  - c. If possible, leave medical personnel who entered the safety perimeter until they can be controlled for contamination and, if needed, decontaminated. Medical personnel handling victims outside the safety perimeter should stay outside that perimeter. If personnel is short and lives are at risk, do not worry about the contamination of medical personnel; it is likely very low risk; and
  - d. Once the patient has been transferred to the hospital, ensure the transport vehicle and all handlers are free from contamination.
- 3) If the situation is a mass casualty emergency, decontamination may not be required prior to returning to the scene;
  - 4) OSC should notify Lead MS STA of all casualty information, including the nature of the injuries and possible contamination. The Lead MS STA must assess the situation and determine if additional resources will be required;
  - 5) Based on available resources, the Lead MS STA should confirm with OSC that the receiving facilities are equipped with the proper capabilities to treat the incoming casualties. If the STA, or medical LO, determine that there is a more suitable facility, the STA should request the OSC to redirect the transport of casualties accordingly;
  - 6) The RNCT logistics staff should contact the receiving facility to relay the casualty information and begin the casualty tracking procedures;
  - 7) If required, the STA must be available to answer any technical questions presented by the treating physicians at the receiving facility (i.e., isotope, dose received, etc.);
  - 8) The RNCC is responsible for maintaining regular contact with the medical facilities to obtain current casualty status to relay back to the respective MS EOC Medical LOs or respective foreign nation representatives;
  - 9) Repatriation of casualties will become the responsibility of the MS or foreign nation from which the recovered victim hails; and
  - 10) Dispose of all non-essential and renewable contaminated articles in clearly marked containers (with a radioactive trefoil).

END CASUALTY MANAGEMENT PROCEDURES

## **8. PROCEDURES FOR THE PROTECTION OF EMERGENCY WORKERS**

---

### **8.1 Responsibility**

The RNCT STA is responsible for ensuring that the protective posture employed by regional emergency workers is appropriate for the hazard, based on available technical information. Regional emergency workers are responsible for ensuring that protective measures recommended by the STA are followed. On-scene emergency workers receive their protective posture direction from the OSC as discussed with the Lead MS STA.

### **8.2 Purpose**

- Ensure the right level of protective posture is adopted for all emergency workers.

### **8.3 Input**

In order to ensure that the proper protective measures are taken, the STA will require the following information to make a recommendation:

- Dose rate surveys;
- Dose projections; and
- Environmental contamination information.

### **8.4 Output**

- Adequate protective posture recommendations for all emergency workers.

### **8.5 Procedure**

Protection measures taken by emergency workers will be determined by the proximity to the site of the emergency. Standardized regional protocols should be followed by all emergency workers.

#### **8.5.1 Responders at the scene**

- 1) All on-scene responders under the direction of the OSC and the Lead MS should have an electronic dosimeter with the following alarm settings:
  - a. Dose rate alarm: 100 mSv/h; and
  - b. Dose alarm: 5 mSv; and
- 2) The Lead MS STA will recommend that the following measures should be taken by regional emergency workers on-scene based on the protective measure described in Table 7.



**Table 7: Protective Measures based on hazard**

On-Scene Hazard	Protective Measure
Airborne contamination suspected	<ul style="list-style-type: none"> <li>▪ Wear anti-contamination clothing and respirators</li> <li>▪ Minimum standard for respirator is a half-face mask with charcoal filter</li> <li>▪ Surgical masks are appropriate for life-save situations</li> </ul>
No airborne contamination suspected	No respiratory protection is required
Alpha sources suspected	Ensure appropriate instruments are used to measure radiation
Radioactive iodine suspected	Take iodine prophylaxis before arriving at the scene

**8.5.2 Responders away from the scene**

The RNCT STA should provide the following recommendations for workers who are conducting surveys well outside the immediate area of the emergency.

The level of protection depends on the recommended actions for the public, dose rates and projected dose as summarized in Table 8,

Table 9 and Table 10, below.

**Table 8: Recommended emergency workers protective posture**

Recommended action for the public in the area of interest	Recommended action for the emergency workers in that area
No urgent protective action	None
Sheltering or evacuation	<ul style="list-style-type: none"> <li>▪ Respiratory protection</li> <li>▪ Contamination control at the end of the work shift</li> <li>▪ Replacement clothing if required</li> </ul>
Longer term protective actions are considered in that area	<ul style="list-style-type: none"> <li>▪ Gloves</li> <li>▪ Consider the use of surgical masks for handling samples that are collected</li> </ul>

**Table 9: Recommended emergency workers protection based on dose rates**

Dose rate	Do not exceed this dose rate unless otherwise approved by the STA
>1000 mSv/h, limited to 30 minutes in the area	Do not enter, unless it is under the expressed request of the STA and you feel comfortable with the situation, or it is absolutely necessary and there is a radiation specialist to support you (desirable).
>500 mSv/h	Do not enter unless it is for life saving actions and only for 30 minutes maximum.
>10 mSv/h	Minimize time spent in this area.

**Table 10: Recommended emergency workers protection based on projected dose**

Task	Do not exceed this dose unless otherwise approved by the STA
Life saving	1000 mSv
Actions to prevent significant impacts on the public and the environment	500 mSv
Normal emergency actions	50 mSv

During the course of their duties, responders may accumulate a dose that is tracked by the RNCT STA's dose assessment team. Once a predefined maximum dose is reached, permission from superiors must be sought before exceeding the next dose level. Table 11 provides the dose limit and the level of authority required to exceed that limit.

**Table 11: Authority required to exceed given dose**

Dose Limit	Authority required to exceed the limit
50 mSv	OSC
100 mSv	STA
250 mSv	RNCT Chair
500 mSv	MS Representative responsible for the first responder

END PROCEDURE FOR THE PROTECTION OF EMERGENCY WORKERS

## 9. DOSE PROJECTION PROCEDURES

---

### 9.1 Responsibility

The dose assessment team is responsible for providing the RNCT STA with dose projection data required to make recommendations for protective countermeasures.

### 9.2 Purpose

- Enable the RNCT STA to make accurate and effective recommendations based on anticipated exposure.

### 9.3 Input

The dose assessment team will require the following information to calculate dose projection:

- Situational information;
- Source term information (maybe);
- Survey measurements (maybe);
- Meteorological data; and
- Plume tracking projections.

### 9.4 Output

- Anticipated exposure in areas where intervention levels may be exceeded. The STA will use this information to recommend short-term and long-term countermeasures to be taken.

### 9.5 Procedure

- 1) Since the source term is usually not known, dose projections will often have assumptions built into the results;
- 2) Survey data will be used to calibrate the dose projections. It is important to acknowledge that survey measurements are an indication of what has already transpired, and does not necessarily predict what will occur in the coming hours;
- 3) Projections will also consider current and future meteorological conditions, with the understanding that weather can easily and quickly change;
- 4) Results submitted to the STA for review and recommended actions will note the following:
  - a. Key assumptions used for the calculations;
  - b. Areas of major uncertainty; and
  - c. Impact that unknowns may have on the calculated results;
- 5) For short-term countermeasures, the STA should expect the dose calculations to be a combination of:
  - a. External effective dose from the plume for the whole duration of the release (or four hours, if winds are expected to change);
  - b. External effective dose from the ground shine for a one-week exposure;
  - c. Committed effective internal dose from inhalation during the plume passage; and
  - d. In cases where deterministic effects are expected, the organ equivalent dose should be reported;
- 6) For longer-term countermeasures, ground contamination should be projected. Longer-term dose assessment will be done later, on the basis of more detailed ground contamination characterization. The exposure period should be consistent with the proposed countermeasure;

- 7) Dose projection results submitted to the STA will include the following:
  - a. Areas where sheltering intervention levels may be exceeded based on current conditions;
  - b. Areas where evacuation intervention levels may be exceeded based on current conditions;
  - c. Areas where sheltering intervention levels may be exceeded based on worst case scenario (i.e., significant changes in weather or release that could increase contaminated area or overall activities);
  - d. Areas where evacuation intervention levels may be exceeded based on worst case scenario;
  - e. Areas where ground contamination may exceed intervention levels for agricultural countermeasures based on current conditions; and
  - f. Areas where ground contamination may exceed intervention levels for agricultural countermeasures based on worst case scenario;
- 8) Results will be briefed verbally to the STA with a subsequent email to follow; and
- 9) Update results every hour (or immediately) should there be any change.

END DOSE PROJECTION PROCEDURE

## **10. SITUATION REPORT PROCEDURE**

---

### **10.1 Responsibility**

The RNCT Chair is responsible for all situation reports disseminated to the MS.

### **10.2 Purpose**

- Periodically inform notified MS of state of emergency and identify any immediate issues that may impact the region; and
- Communicate recommendations for protective actions as identified by the STA to be taken by affected MS.

### **10.3 Input**

The following information is required to generate a complete and effective situation report:

- Up-to-date situational information provided by OSC;
- Up-to-date information regarding MS via RNCT MS delegates;
- Medical information, including status of casualty management;
- Survey measurements provided from survey teams;
- Dose projections provided dose assessment teams;
- Meteorological information; and
- Plume tracking projections.

### **10.4 Output**

- Structured briefing to the MS as outlined in Appendix 1 to Procedure 9. All MS receive the same information.

### **10.5 Procedure**

- 1) Complete the briefing form contained in Appendix 1 to this procedure every two hours or as agreed with the MS;
- 2) Ensure that MS delegates are in agreement on the details provided on the Situation Report prior to sending to MS contact points;
- 2) Send the briefing package to MS contact points by email or fax;
- 3) If and when required (i.e., significant change in emergency status etc), organize a conference call with MS contact points to explain and discuss;
- 4) Collect and log questions from MS contact points; and
- 5) Ensure that all MS enquiries are addressed quickly or at the next briefing.

**APPENDIX 1 TO SITUATION REPORT PROCEDURE: MS BRIEFING FORMAT**

<b>Time:</b>	
<b>From</b>	
<b>Situation:</b>	
<b>Prognosis</b>	<u>Most likely</u> <i>Describe the most likely impact.</i>
	<u>Worst case</u> <input type="checkbox"/> Likely <input type="checkbox"/> Not likely <input type="checkbox"/> Almost impossible <i>Describe the worst case scenario, and specify if this is a likely, not likely or almost impossible scenario by checking the appropriate box.</i>
<b>Protective action recommendations:</b>	Attachments: <input type="checkbox"/> <i>Plume tracking projections</i> <input type="checkbox"/> <i>Dose projections with areas where intervention levels for urgent protective action are exceeded</i> <input type="checkbox"/> <i>Areas where ground contamination action levels are expected to be exceeded</i> <input type="checkbox"/> <i>Weather projection</i> <input type="checkbox"/> <i>Radiation monitoring measurements</i>  <i>Explain the data and provide a summary of the recommendations</i>
<b>Immediate issues:</b>	<i>Include:</i> <input type="checkbox"/> <i>Need for assistance</i> <input type="checkbox"/> <i>Operational issues</i> <input type="checkbox"/> <i>Public affairs issues</i> <input type="checkbox"/> <i>Cross border issues</i> <input type="checkbox"/> <i>Communications issues</i> <input type="checkbox"/> <i>Others</i>
<b>Other recommendations</b>	<i>Include recommendations for regional coordination other than protective action recommendations.</i>

END SITUATION REPORT PROCEDURE

## **11. RADIATION MEASUREMENT AND REPORTING PROCEDURE**

---

### **11.1 Responsibility**

Survey teams and the STA are responsible for the implementation of this procedure.

### **11.2 Purpose**

- Measure and communicate radiation data in a consistent and standardized manner to ensure that effective protective measures can be implemented by the RNCT, if required.

### **11.3 Input**

- Radiation measurements from survey teams both on-scene and off-site.

### **11.4 Output**

- Standardized radiation measurements.

### **11.5 Procedure**

Depending on the type of emergency, the STA would require specific measurement readings before any recommendations can be made.

#### **11.5.1 For nuclear power plant (land or marine-based)**

- 1) Measurements of ambient gamma/beta dose rates;
- 2) Air sample readings if airborne contamination is suspected; and
- 3) Air filter (charcoal plus paper) contamination measured at 1 cm from the sample in a shielded container.

#### **11.5.2 For emergencies involving alpha emitters**

- 1) Air sample readings;
- 2) Air filter (charcoal plus paper) contamination measured at 1 cm in a shielded container; and
- 3) Surface contamination readings.

#### **11.5.3 In all cases**

- 1) Assess all readings on the form provided in Appendix 1, Table 12 of this procedure; and
- 2) STA will require the following information:
  - a. Column ALPHA;
  - b. Data from column A;
  - c. Column BRAVO;
  - d. Data from column B;
  - e. Etc.; and
  - f. If the cell is empty, report "BLANK".

**APPENDIX 1 TO RADIATION MEASUREMENT AND REPORTING PROCEDURE: RECORDING RADIATION READINGS**

Survey team designation or name: \_\_\_\_\_

**Table 12: Sample Recording Template**

<b>Alpha</b>	<b>Bravo</b>	<b>Charlie</b>	<b>Delta</b>	<b>Echo</b>	<b>Foxtrot</b>	<b>Gulf</b>	<b>Hotel</b>	<b>India</b>	<b>Juliet</b>
Sample No.	Time of air sample	Time of reading	Longitude E	Latitude N	Type of measurement AG=ambient gamma-beta AS = air sample GC = ground contamination	Type G = gamma B = beta A = alpha	Reading	Unit	Tendency (Up Stable Down)

END RADIATION MEASUREMENT AND REPORTING PROCEDURE



## **12. REQUEST FOR ASSISTANCE PROCEDURE**

---

### **12.1 Responsibility**

It is the responsibility of the RNCC to coordinate and provide any assistance requested by a MS. The RNCT will arrange for the necessary resources as required.

### **12.2 Purpose**

- Assist MS using a standardized format to ensure that the assistance will be efficiently provided and effectively used.

### **12.3 Input**

- Operational details and resources needed by an affected MS.

### **12.4 Output**

- Effective coordination of available resources to assist the affected MS requesting assistance.

### **12.5 Procedure**

- 1) MS must first request assistance via phone, fax or email to initiate the procedures;
- 2) Inform RNCT Chair of the request for assistance;
- 3) Follow up by sending the Request for Assistance form (Appendix 1, Table 13 of this procedure) to MS by email or fax with instruction to return it to the RNCC; and
- 4) MS delegate must then coordinate the RNCT effort for the dispatch and employment of the resources provided.

**APPENDIX 1 TO REQUEST FOR ASSISTANCE PROCEDURE: REQUEST FOR ASSISTANCE FORM**

**Table 13: Request for Assistance Form**

Date and time	
Requesting organization and contact information	
Nature of the request	
<b>Operational details</b>	
Detailed task	
Estimated duration of task	
Task leader	
Operational contact information	
Arrangements for entry into MS	
Requirements	
Other considerations	
Financial arrangements	

END REQUEST FOR ASSISTANCE PROCEDURE

## **13. INTERVIEWS WITH THE MEDIA PROCEDURE**

---

### **13.1 Responsibility**

Under most circumstances, the RNCT will have dedicated representatives tasked with managing all aspects of public affairs. On occasion, select subject matter experts (SME's) within the RNCC may be required to make impromptu media statements or provide an interview to the media.

### **13.2 Purpose**

- Provide basic guidelines for RNCC members when speaking to the media.

### **13.3 Input**

RNCC members tasked with dealing with the media will require the following information:

- Key messages issued from the RNCC media teams;
- Specific itinerary of the planned media interaction; and
- Support tools (such as anticipated questions and answers) and presentation material.

### **13.4 Output**

- Media interview

### **13.5 Procedure**

- 1) Get a briefing from the media staff on the major issues, concerns and rumours;
- 2) Learn the key messages from the media team or from the RNCT Chair, if the media team is not available;
- 3) Address only those concerns and key messages that are identified by the media team;
- 4) Be aware that the public perception of risk may be inaccurate;
- 5) Do not speculate and ensure that comments are within a respective scope of knowledge;
- 6) Typical questions from the public may include some of the following and should be incorporated into key messages:
  - a. Are we in danger? How can I protect myself?;
  - b. Who is responsible? What can we expect?;
  - c. Why did this happen?; and
  - d. What else could go wrong?
- 7) Refrain from using too many technical terms that the public may not understand. Employ jargon that is easy to understand by most laypersons. Terms such as "clean" and "not clean", "dangerous" and "not dangerous" should be used when communicating with the public;
- 8) Be honest and accurate;
- 9) Remember the following rules:
  - a. All statements are recorded and will go on record;
  - b. Speak to respective area of expertise and within a level of comfort;
  - c. Professional behavior should be expected and maintained; and
  - d. Ensure a complete and accurate understanding of the key messages to be conveyed before the interview commences. Talk to the media specialists.

END INTERVIEWS WITH THE MEDIA PROCEDURE

---

**ANNEX A – CONTACT LIST**

---

To be completed by MS Representatives.

**Table A-14: Contact list**

<b>MS or organization</b>	<b>Telephone</b>	<b>Fax</b>	<b>Email</b>
Kingdom of Bahrain			
Islamic Republic Iran			
Republic of Iraq			
State of Kuwait			
Sultanate of Oman			
State of Qatar			
Kingdom of Saudi Arabia			
United Arab Emirates			
MEMAC			
RNCC			
IAEA			
Dose Assessment Team			

**ANNEX B – PROTECTIVE ACTIONS: RISK AND BENEFITS**

**Table B-15: Risk/benefits of protective actions**

Action	Purpose	Issues to consider
<b>Sheltering</b>	<ul style="list-style-type: none"> <li>▪ Protects against airborne contamination, cloud shine and ground shine.</li> <li>▪ Simple to implement.</li> <li>▪ Allows for preparation of an evacuation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Will impact local businesses.</li> <li>▪ Causes anxiety; people feel exposed to a hazard and unable to escape it.</li> <li>▪ May lead to spontaneous evacuation.</li> <li>▪ Sheltering should not be longer than 24 hours.</li> <li>▪ Protection decreases rapidly with time, as contaminated air slowly creeps in the homes.</li> <li>▪ What do we do with the farm animals?</li> </ul>
<b>Evacuation</b>	<ul style="list-style-type: none"> <li>▪ Full protection against exposure to radiation, provided that the evacuation is completed before a significant release.</li> <li>▪ Gives the feeling of full protection for evacuees.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very disruptive and costly. Immediate compensation and financial assistance will be required.</li> <li>▪ Infrastructure and services required at the evacuation destination.</li> <li>▪ If the evacuation is done during the release, the exposure of the public may be increased.</li> <li>▪ Economic impact on local businesses.</li> <li>▪ Industries may not be able to shutdown their operation in time required for evacuation.</li> <li>▪ This shutdown of industries could lead to very high costs and compensation claims.</li> <li>▪ Once evacuated, it is difficult to decide when people can return, especially if contamination is left on the ground. Some people may return; others will not.</li> <li>▪ Long term economic impact due to perception that the evacuated land is permanently affected.</li> <li>▪ How do we deal with the farm animals left behind?</li> <li>▪ Arrangements are required for pets (cats, dogs and others).</li> </ul>
<b>Stable iodine administration</b>	<ul style="list-style-type: none"> <li>▪ Protect against the inhalation or ingestion of radioactive iodine.</li> <li>▪ This is NOT an appropriate measure unless there is radioactive iodine (reactor emergency).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very small chance of side effects.</li> <li>▪ Supply needs to be sufficient.</li> <li>▪ One question will be: how long do we need to take it?</li> <li>▪ Creates anxiety in some, and a false of security in others.</li> <li>▪ Distribution can be slow.</li> <li>▪ Its effectiveness decreases significantly if it is taken more than 2 hours after exposure to radioactive iodine.</li> <li>▪ How to deal with transient populations.</li> <li>▪ Psychosocial impacts can be expected if iodine prophylaxis is given but people are not evacuated.</li> </ul>
<b>Food bans</b>	<ul style="list-style-type: none"> <li>▪ Protect the local population from contaminated food.</li> <li>▪ Prevent the insertion of contaminated food in the food industry.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Likely to lead to a total and long term loss of confidence in the food grown in the entire region, even if there is no actual contamination.</li> <li>▪ Long term economic impacts due to perception that the land is now contaminated.</li> </ul>

**ANNEX C – INTERVENTION AND ACTION LEVELS**

**Table C-16: Protective action intervention levels**

Protective action	Generic intervention level
Sheltering	10 mSv
Evacuation	50 mSv
Iodine prophylaxis	100 mGy
Temporary relocation	Initiate at 30 mSv in 30 days <sup>3</sup> Terminate at 10 mSv in 30 days <sup>4</sup>
Permanent resettlement	1 Sv in lifetime

**Table C-17: Action levels for restricting contaminated food**

Radionuclides In Foods Destined For General Consumption	kBq/kg
Cs-134, Cs-137, I-131, Ru-103, Ru-106, Sr-89	1
Sr-90	0.1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0.01
Radionuclides In Milk, Infant Foods And Drinking Water	kBq/kg
Cs-134, Cs-137, Ru-103, Ru-106, Sr-89	1
I-131, Sr-90	0.1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0.001

<sup>3</sup> If the dose accumulated in a month is not expected to fall below this level in a year or two, permanent resettlement should be considered.

<sup>4</sup> Provided the total life time dose to any member of the population will be less than 1 Sv.

**ANNEX D – INTERNATIONAL NUCLEAR EVENT SCALE (INES)**

**Table D-18: INES Levels**

INES Level	People and Environment	Radiological Barriers and Control	Defence-in-Depth
Major Accident Level 7	<ul style="list-style-type: none"> <li>Major release of radioactive material with widespread health and environmental effects requiring implementation of planned and extended countermeasures.</li> </ul>		
Serious Accident Level 6	<ul style="list-style-type: none"> <li>Significant release of radioactive material likely to require implementation of planned countermeasures.</li> </ul>		
Accident with Wider Consequences Level 5	<ul style="list-style-type: none"> <li>Limited release of radioactive material likely to require implementation of some planned countermeasures.</li> <li>Several deaths from radiation.</li> </ul>	<ul style="list-style-type: none"> <li>Severe damage to reactor core.</li> <li>Release of large quantities of radioactive material within an installation with a high probability of significant public exposure. This could arise from a major criticality accident or fire.</li> </ul>	
Accident with Local Consequences Level 4	<ul style="list-style-type: none"> <li>Minor release of radioactive material unlikely to result in implementation of planned countermeasures other than local food controls.</li> <li>At least one death from radiation.</li> </ul>	<ul style="list-style-type: none"> <li>Fuel melt or damage to fuel resulting in more than 0.1% release of core inventory.</li> <li>Release of significant quantities of radioactive material within an installation with a high probability of significant public exposure.</li> </ul>	
Serious Incident Level 3	<ul style="list-style-type: none"> <li>Exposure in excess of ten times the statutory annual limit for workers.</li> <li>Non-lethal deterministic health effect (e.g., burns) from radiation.</li> </ul>	<ul style="list-style-type: none"> <li>Exposure rates of more than 1 Sv/h in an operating area.</li> <li>Severe contamination in an area not expected by design, with a low probability of significant public exposure.</li> </ul>	<ul style="list-style-type: none"> <li>Near accident at a nuclear power plant with no safety provisions remaining.</li> <li>Lost or stolen highly radioactive sealed source.</li> <li>Misdelivered highly radioactive sealed source without adequate procedures in place to handle it.</li> </ul>
Incident Level 2	<ul style="list-style-type: none"> <li>Exposure of a member of the public in excess of 10 mSv.</li> <li>Exposure of a worker in excess of the statutory annual limits.</li> </ul>	<ul style="list-style-type: none"> <li>Radiation levels in an operating area of more than 50 mSv/h.</li> <li>Significant contamination within the facility into an area not expected by design.</li> </ul>	<ul style="list-style-type: none"> <li>Significant failures in safety provisions but with no actual consequences.</li> <li>Found highly radioactive sealed orphan source, device or transport package with safety provisions intact.</li> <li>Inadequate packaging of a highly radioactive sealed source.</li> </ul>
Anomaly Level 1			<ul style="list-style-type: none"> <li>Overexposure of a member of the public in excess of statutory annual limits.</li> <li>Minor problems with safety components with significant defence-in-depth remaining.</li> <li>Low activity lost or stolen radioactive source, device or transport package.</li> </ul>
NO SAFETY SIGNIFICANCE ( <i>Below Scale/Level 0</i> )			

**ANNEX E – GLOSSARY**

---

<b>Action Level</b>	The level of dose rate or activity concentration above which remedial actions or protective actions should be carried out in chronic exposure or emergency exposure situations. An action level can also be expressed in terms of any other measurable quantity as a level above which intervention should be undertaken.
<b>Acute Exposure</b>	An exposure to radiation received in a short period of time, i.e., seconds, minutes, or hours.
<b>Acute Radiation Syndrome</b>	A collection of symptoms caused by receiving a relatively high dose of radiation to the body in a short time (usually minutes). The earliest symptoms are blood cell changes, nausea, fatigue, vomiting and diarrhea. Hair loss, bleeding, swelling of the mouth and throat and general loss of energy may follow. Deterministic effects may be detectable above 0.5 Sv and severe deterministic health effects are possible above 1 to 5 Sv.
<b>ALARA</b>	All reasonable measures are taken to minimize radiation exposure to levels As Low As Reasonably Achievable (ALARA), social and economic factors taken into consideration. For military operations, operational considerations are also taken into consideration.
<b>Background Radiation</b>	Radiation associated with natural sources or any other sources in the environment that are not amenable to control.
<b>Bioassay</b>	Any procedure used to determine the nature, activity, location or retention of radionuclides in the body by direct (in vivo) measurement or by in vitro analysis of material excreted or otherwise removed from the body.
<b>Chronic Exposure</b>	Exposure persisting in time. Normally refers to exposures persisting for many years as a result of long-lived radionuclides in the environment.
<b>Cloud Shine</b>	External exposure from airborne radionuclides.
<b>Controlled Access Area</b>	An area where the dose rate may exceed the level permitted in public access areas and to which access by any person other than a worker is controlled.
<b>Decontamination</b>	The complete or partial removal of contamination by a deliberate physical, chemical or biological process.
<b>Deterministic Effects</b>	A radiation effect for which generally a threshold level of dose exists above which the severity of the effect is greater for a higher dose. Such an effect is described as a 'severe deterministic effect' if it is fatal or life-threatening or results in a permanent injury that decreases the quality of life.



<b>Dirty Bomb</b>	A device designed to spread radioactive material by conventional explosives when the bomb explodes. A dirty bomb kills or injures people through the initial blast of the conventional explosive and spreads radioactive contamination over possibly a large area—hence the term “dirty.” Such bombs could be miniature devices or large truck bombs. See also Radiological Dispersal Device (RDD).
<b>Dose Averted</b>	The dose prevented by the application of a countermeasure or set of countermeasures, i.e. the difference between the projected dose if the countermeasure(s) had not been applied and the actual projected dose.
<b>Dosimetry</b>	Assessment (by measurement or calculation) of radiation dose.
<b>Downwind Sector</b>	The sector 30° on either side of the prevailing wind direction, downwind of the emergency site.
<b>Emergency Classification Level</b>	A simple system that describes the severity scale of an emergency. The emergency class is directly related to risk for the workers and the public. It is used for communicating to the response organizations and the public the level of response needed.
<b>Emergency Worker</b>	A worker who may be exposed in excess of occupational dose limits while performing actions to mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment.
<b>Fission Products</b>	The radioactive elements created by the fission process.
<b>Hull Shine</b>	The external gamma radiation hazard on the exterior of a nuclear powered vessel due to fission products released to and dispersed within the reactor compartment of the vessel.
<b>Noble Gases</b>	A group of gaseous elements (e.g., xenon, krypton, etc.) that do not interact with other elements (i.e., NER team). Radioactive noble gases dissipate quickly and are not retained inside the body even when inhaled, thus pose little threat to an individual (except in a closed-in area).
<b>Nuclear Capable Vessel (NCV)</b>	A ship or submarine that is designed for the transport, storage or deployment of nuclear weapons.
<b>Nuclear Powered Vessel (NPV)</b>	A ship or submarine that is powered wholly or partly by nuclear energy.
<b>Nuclear Weapon Emergency</b>	An unexpected event involving a fire or explosion involving a nuclear weapon.
<b>Off-Site Emergency</b>	A nuclear emergency involving a reactor or nuclear weapon, which has led, or may lead, to a significant release of radioactive material from the facility.

<b>On-Scene Response</b>	This is the portion of the response that takes place within the immediate area of the emergency. There is no fixed or firm definition of what is meant by "immediate". In general, this includes the area that is controlled by the emergency first responders and from which non-essential personnel and persons are evacuated.
<b>On-Scene Controller (OSC)</b>	An Officer who, through their training and experience, is capable of overseeing the on-scene non-radiological response to a nuclear emergency.
<b>On-Scene Authority</b>	In general, this is the Lead MS. The direct on-scene authority is the senior designated officer at or near the emergency site. A designated component of the on-scene authority is responsible for liaison with the off-site authority.
<b>Operational Intervention Levels (OIL)</b>	A calculated level, measured by instruments or determined by laboratory analysis, that corresponds to an intervention level or action level.
<b>Recovery</b>	This involves two concepts. The first one is "back to business", and the second is return to normal. In the first case, measures are taken to render the affected areas safe enough for business activities to resume, though special precautions may need to be taken to reduce the potential exposure of the public or workers. In the second case, longer term measures are taken to return the affected area to its pre-emergency state.
<b>Regional Nuclear/Radiological Coordination Center (RNCC)</b>	This is the centre from which the regional response is coordinated. Normally, this is the CRISIS CENTER operations centre, unless otherwise agreed to by the lead MS and CRISIS CENTER. In this concept of operations, within the context of an RN event, the CRISIS CENTER operations centre is referred to as the RNCC.
<b>Senior Technical Advisor</b>	A person who, through their training and experience, is qualified to advice on all radiological and technical aspects of a RN emergency. This person is normally a post-graduate qualified nuclear engineer or physicist.
<b>Site</b>	Area immediately surrounding the location where an emergency has taken place or can take place. For a fixed facility, this is a geographical area that contains the authorized facility, activity or source, and within which the management of the authorized facility or activity may directly initiate emergency actions. For an event that takes place in the RSA, the site refers to the area controlled by the on-scene emergency response services.
<b>Site Emergency</b>	Events resulting in a major decrease in the level of protection for those on or near the site. Emergency response level adopted when there is a confined nuclear emergency with no radiological threat to the public.
<b>Surveillance</b>	This is part of the prevention phase preceding the discovery of a RN emergency. It involves active and passive measures to detect the present of illicit RN material, or the unexpected presence of radiation in the environment.

**Survey Specialist**

A person who through their training and practical experience is qualified to conduct surveys of radioactive contamination.

**Threat**

An act of coercion wherein a negative consequence is proposed to elicit response.

**ANNEX F – LIST OF ABBREVIATIONS**

---

<b>ACMZ</b>	Automatic Countermeasure Zone
<b>ACP</b>	Access Control Point
<b>AEZ</b>	Automatic Evacuation Zone
<b>ALARA</b>	As Low As Reasonably Achievable
<b>Bq</b>	Becquerel
<b>CAZ</b>	Controlled Access Zone
<b>CC</b>	Crisis Center
<b>CCP</b>	Contamination Control Point
<b>Ci</b>	Curie
<b>cpm</b>	Counts Per Minute
<b>cps</b>	Counts Per Second
<b>CPZ</b>	Contingency Planning Zone
<b>CVN</b>	Nuclear Powered Aircraft Carrier
<b>DCP</b>	Decontamination Control Point
<b>DM</b>	Deputy Minister
<b>dps</b>	Disintegrations per Second
<b>DPZ</b>	Detailed Planning Zone
<b>DRD</b>	Direct Reading Dosimeter
<b>ED</b>	Electronic Dosimeter (see DRD)
<b>EOC</b>	Emergency Operations Center
<b>EPZ</b>	Emergency Planning Zone
<b>ERBS</b>	Environmental Radionuclide Baseline Study
<b>ERL</b>	Emergency Response Level
<b>ERMP</b>	Environmental Radiological Monitoring Program
<b>Gy</b>	Gray
<b>HE</b>	High Explosives
<b>HF</b>	High Frequency
<b>IAEA</b>	International Atomic Energy Agency
<b>ICRP</b>	International Commission on Radiation Protection
<b>IEC</b>	Incident and Emergency Center of the IAEA
<b>IHE</b>	Insensitive High Explosive
<b>KI</b>	Potassium Iodide

<b>LPZ</b>	Longer Term Protective Action Zone
<b>MARPOL</b>	International Convention for the Prevention of Pollution from Ships
<b>MEMAC</b>	Marine Emergency Mutual Aid Center
<b>MS</b>	Member State
<b>mSv</b>	millisievert
<b>MS EOC</b>	Member State Emergency Operations Center
<b>NCV</b>	Nuclear Capable Vessel
<b>NER</b>	Nuclear Emergency Response
<b>NPP</b>	Nuclear Power Plant
<b>NPV</b>	Nuclear Powered Vessel
<b>OIL</b>	Operational Intervention Level
<b>OSC</b>	On-Scene Controller
<b>PA</b>	Public Affairs
<b>PAZ</b>	Precautionary Action Zone
<b>PB</b>	Planning Basis
<b>PIT</b>	Potassium Iodide Tablet
<b>PPE</b>	Personal Protective Equipment
<b>PWR</b>	Pressurized Water Reactor
<b>RAM</b>	Radioactive Material
<b>RCC</b>	Regional Coordination Center
<b>RN</b>	Radiological/Nuclear
<b>RNCC</b>	Regional RN Coordination Center
<b>RNEPC</b>	Regional RN Emergency Preparedness Committee
<b>RNCT</b>	Regional RN Coordination Team
<b>RNERP</b>	RN Emergency Response Plan
<b>RO</b>	Regional Organization
<b>ROPME</b>	Regional Organization for the Protection of the Marine Environment
<b>RSA</b>	ROPME Sea Area
<b>SCBA</b>	Self Contained Breathing Apparatus
<b>SOP</b>	Standard Operating Procedure
<b>SSBN</b>	Nuclear Powered Ballistic Missile Submarine
<b>SSGN</b>	Nuclear Powered Guided Missile Submarine
<b>SSN</b>	Nuclear Powered Attack Submarine
<b>STA</b>	Senior Technical Advisor

**Sv**..... sievert  
**TBD**.....To Be Developed  
**TBP** ..... To Be Promulgated  
**TLD** ..... Thermoluminescent Dosimeter  
**TTX** .....Table Top Exercise  
**UNCLOS**.....United Nations Convention of the Law of the Sea  
**UPZ**.....Urgent Protective Action Zone  
**WMO** .....World Meteorological Organization  
**WSC** .....Working Sub Committee

## **REFERENCES**

- [1] IAEA GS-R-2, *Preparedness and Response for a Nuclear or Radiological Emergency*, 2002