EPR-
RANET
2006

EMERGENCY PREPAREDNESS
AND RESPONSE

IAEA Response Assistance Network

Incident and Emergency Centre

DATE EFFECTIVE: **1 MAY 2006**

IAEA
International Atomic Energy Agency

EPR-
RANET
2006

EMERGENCY PREPAREDNESS
AND RESPONSE

IAEA Response Assistance Network

Incident and Emergency Centre

DATE EFFECTIVE: **1 MAY 2006**

IAEA
International Atomic Energy Agency

This publication has been prepared by the:

Incident and Emergency Centre
International Atomic Energy Agency
Wagramer Strasse 5
P.O. Box 100
A-1400 Vienna, Austria

IAEA RESPONSE ASSISTANCE NETWORK
IAEA, VIENNA, 2006
EPR-RANET (2006)

Printed by the IAEA in Austria
March 2006

Foreword

The Parties to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention) have undertaken to cooperate between themselves and with the IAEA to facilitate the prompt provision of assistance in the case of a nuclear accident or radiological emergency, in order to mitigate its consequences.

In September 2000 the General Conference of the IAEA in resolution GC(44)/RES/16: *"encouraged Member States to implement instruments for improving their response, in particular their contribution to international response, to nuclear or radiological emergencies as well as to participate actively in the process of strengthening international, national and regional capabilities for responding to nuclear or radiological emergencies and to make those capabilities more consistent and coherent."*

The Secretariat, as part of the IAEA's strategy for supporting the practical implementation of the Assistance Convention, established in 2000 a global Emergency Response Network (ERNET) of teams suitably qualified to respond rapidly and, in principal, on a regional basis, to nuclear or radiological emergencies. The Secretariat published the IAEA Emergency Response Network, ERNET, EPR-ERNET in 2000, which set out the criteria and requirements to be met by members of the network. An updated edition was published in 2002.

The Second Meeting of Competent Authorities identified under the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, held in Vienna in June 2003, recommended that the Secretariat of the IAEA convene a Technical Meeting to formulate recommendations on steps to be taken to overcome problems in the network participation. Participants of a Technical Meeting held in March 2004 developed a new concept for the network and a completely new draft of the report.

At the IAEA Board of Governors meeting held in June 2004, an international Action Plan, GOV/2004/40 (Corrected), was approved for strengthening the international preparedness and response system for nuclear and radiological emergencies. Action B.7 of that action plan is to review and develop the assistance network concept, with the aim of having enhanced arrangements necessary to ensure the efficient, effective and safe implementation of IAEA brokered assistance through the network concept of registering, in advance of an emergency, qualified capabilities to provide certain types of assistance through the IAEA should the need arise. The present revision of the report is seen as a major step that will contribute to completion of Action B.7.

In February 2005, the Director General of the IAEA approved the establishment of the Incident and Emergency Centre (IEC) to serve as the Agency's focal point for responding to nuclear or radiological incidents and emergencies. It will, inter alia, provide for an integrated system through which States, their competent authorities, international organizations, technical experts and the Secretariat can effectively coordinate the provision of assistance for response to incidents or emergencies. The new report has been worded on the assumption that it can be used to provide assistance to incidents as well as emergencies.

In July 2005, the Third Meeting of Competent Authorities identified under the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency accepted the new draft of the assistance as resolving the critical issues that had been hindering participation.

This resulting publication is, therefore, the third edition of the main assistance network document. It is a complete revision of the previous edition either with all relevant sections updated, withdrawn or replaced with new material to reflect a new operational and broader concept for the network and to better meet competent authorities'

expectations. To reflect the new concept of the network it was also decided to rename the network to: **Response Assistance Network (RANET)**.

The publication is worded on the assumption that a State's Competent Authority designated as the body responsible for responding to nuclear or radiological emergencies that occur outside the jurisdiction of their own State, the Competent Authority (Abroad), CA(A), will 1) additionally be responsible for receiving and acting on requests for assistance in the case of a nuclear or radiological incident, and 2), if party to the Assistance Convention, be the State's competent authority authorised to make and receive requests for and to accept offers of assistance under the Convention in the event of a nuclear accident or radiological emergency.

In September 2004, the General Conference in resolution GC(48)/RES/10 encouraged Member States to *"put in place arrangements for effective response to requests made under the Assistance Convention and, within their respective capabilities, to make resources available for responding to such requests, and to consider joining the IAEA response network, ERNET"*. All States parties to the Assistance Convention are therefore invited to join the RANET to facilitate the prompt provision of assistance in the case of nuclear or radiological incidents or emergencies.

EDITORIAL NOTE

The views expressed do not necessarily reflect those of the governments of States that are IAEA Member States and/or Parties to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, or of other relevant international intergovernmental organizations, or of the governments of other States.

Although great care has been taken to maintain the accuracy of information contained in this manual, neither the IAEA nor its Member States assume any responsibility for consequences that may arise from its use.

NOTES FOR THE USER

This publication enters into effect on 1 May 2006. It supersedes all previous versions of the EPR-ERNET publication. All copies of previous editions of EPR-ERNET should be removed from operational response systems and either archived or destroyed.

This edition contains major changes in the concept, organization and name of network as well as in the requirements for its membership. In addition, the structure of the EPR-ERNET (2002) edition was modified and appendices were removed. The network was also renamed. EPR-RANET (2006) has three attachments, which are issued separately: a) Attachment 1 – Assistance Action Plans; b) Attachment 2 – Registry and c) Attachment 3 – Technical Guidelines.

The IAEA's Incident and Emergency Centre is ready to provide any clarification on the implementation of the arrangements described here.

Contents

Section 1

1. INTRODUCTION

1.1. Objectives

This publication is intended to serve as a tool for supporting the provision of international assistance in the case of nuclear or radiological incident or emergency, cooperation between States, their Competent Authorities and the IAEA, and harmonization of response capabilities of States offering assistance.

1.2. Scope

The publication is issued under the authority of the Director General of the IAEA:

(1) under the auspices of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention) [1], to promote, facilitate and support cooperation between States Parties to coordinate and/or provide assistance to a State Party and/or Member State; and

(2) in the case of an incident or emergency, as statutory functions, to provide for the application of its safety standards, upon request by a Member State, and to act as an intermediary for the purposes of securing the performance of services or the supplying of materials, equipment or facilities by one Member State for another.

The publication sets out the following:

a) the RANET concept and the organizational structure for providing assistance;

b) functions, responsibilities and activities within the RANET;

c) the RANET response operations and arrangements needed for preparedness; and

d) the prerequisites for RANET membership and conditions of registration.

1.3. Structure

The RANET is divided into four sections. After the introduction in Section 1, the RANET concept, objectives and scope are described in Section 2. Section 3 presents the concept of operations of the RANET and Section 4 describes expected tasks, capabilities and resources.

In addition, EPR-RANET (2006) has three supporting documents, which are issued separately, as follows:

1. *Assistance Action Plans* with samples of Assistance Action Plans for providing international assistance.

2. *Registry* with the details of the registry and instructions on how to register national assistance capabilities for the RANET.

3. *Technical Guidelines* with detailed technical characteristics suggested for assistance capabilities and resources.

1.4. Definitions

Assistance Mission — Normally consists of a small group of qualified experts to address lesser nuclear events providing advice, assessment, training, medical, monitoring or other specialized assistance. It can also be an evaluation, assessment or fact-finding mission.

Assistance Mission Leader — The individual appointed by the IAEA and/or by the relevant Competent Authority to head an Assistance Mission

Assistance Action Plan — A plan for the provision of assistance, including all financial, diplomatic, organizational and logistical aspects, formulated and proposed by the IAEA in coordination with the requesting State, Competent Authority(ies) providing assistance and relevant international organizations as appropriate.

Competent Authority — A contact point that is authorized to issue a notification, advisory[1] message, request for assistance or other emergency information as appropriate, and to reply to requests for information or assistance.

Emergency — A non-routine situation or event that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human health and safety/security, quality of life, property or the environment; it includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard.

[1] As described in IAEA Emergency Notification and Assistance Technical Manual - ENATOM.

External Based Support	Technical advice and analytical expertise to address nuclear or radiological events provided from home offices or other offsite locations. This support is not deployed to the event scene.
Field Assistance Team	A group of technically qualified and equipped personnel from a State Party that may be called upon to provide in situ assistance in a requesting State.
Field Assistance Team Leader	The individual appointed by the relevant Competent Authority to head a Field Assistance Team.
IAEA Field Response Team	A group of qualified and equipped IAEA personnel that may be deployed to provide in-situ assessment and assistance in a requested State.
Incident	Any event or situations that may have actual or threaten radiological consequences to health, property or the environment, or that may be of concern to the media or public, and that could require timely action; any event that is not an emergency and requires a coordinated and timely response.
Incident and Emergency Centre	Serves as a centre for management and coordination of the IAEA's response to nuclear or radiological incidents and emergencies. The Incident and Emergency Centre (IEC) is located at the IAEA's Headquarters in Vienna, Austria.
Intercomparison exercise	Measurement campaign organized to check the quality of different monitoring teams or laboratories.
Joint Assistance Team	A team composed of the IAEA Field Response Team and one or more Field Assistance Team(s).
Joint Assistance Team Chairperson	A Chairperson, who is identified and agreed upon before deployment, heads the Joint Assistance Team Command. He/she manages the on-scene international assistance within the context of the RANET and coordinates its implementation with the requesting State.
Joint Assistance Team Command	The coordinating body on scene composed of all Field Assistance Team leaders and the IAEA Field Response Team leader.
National Assistance Capabilities Coordinator	An individual appointed by the CA(A) to coordinate assistance activities. He or she is the IEC's single official RANET contact in case assistance is requested.
National Assistance Capability	A State's identified experts, equipment and materials that can be made available by a State's Competent Authority (Abroad) either by deployment to the event scene or from home offices or other offsite location.
National Warning Point	A contact point that is staffed or able to be alerted at all times for promptly responding to, or initiating a response to, an incoming notification, advisory message, request for assistance or request for verification of a message as appropriate, from the IAEA.
Orphan source	A radioactive source that is not under regulatory control, either because it has never been under regulatory control, or because it has been abandoned, lost,

misplaced, stolen or transferred without proper authorization.

Qualified expert An individual who, by virtue of certification by appropriate boards or societies, professional licences or academic qualifications and experience, is duly recognized as having expertise in a relevant field of specialization, e.g. medical physics, radiation protection, occupational health, fire safety, quality assurance or an engineering or safety speciality.

Quality assurance Planned and systematic actions necessary to provide adequate confidence that an item, process or service will satisfy given requirements for quality.

1.5. Abbreviations

CA Competent Authority

ConvEx A regime of emergency exercises organized by the IAEA in co-operation with Member States to verify the arrangements for responding under the Early Notification and/or Assistance Conventions.

ENATOM IAEA Emergency Notification and Assistance Technical Operations Manual

EPR According to context, Electron Paramagnetic Resonance or the IAEA's Emergency Preparedness and Response series of publications, of which this report is one.

ERNET IAEA Event Response Network

FAT Field Assistance Team

FRT IAEA Field Response Team

IAEA International Atomic Energy Agency

ICRP International Commission on Radiological Protection

IEC IAEA's Incident and Emergency Centre

RANET IAEA Response Assistance Network

JAT Joint Assistance Team

NAC National Assistance Capabilities

CA(A) Competent Authority for an emergency abroad

NWP National Warning Point

REMPAN Radiological Emergency Medical Preparedness and Assistance Network of the World Health Organization

Section 2

2. RESPONSE ASSISTANCE NETWORK

2.1. Background

The current international framework for response to a nuclear accident or radiological emergency includes but is not limited to the following:

- Statute of the International Atomic Energy Agency
- The Early Notification and Assistance Conventions [1];
- 'International Basic Safety Standards' [2];
- IAEA Safety Requirements GS-R-2 [3];
- IAEA Safety publications on emergency preparedness and response [4–17];
- IAEA Emergency Notification and Assistance Technical Operations Manual – ENATOM [18];
- Joint Radiation Emergency Management Plan of the international organizations – JPLAN [19]; and
- Relevant documents of other international organizations such as the World Health Organization [20], the World Meteorological Organization, the Food and Agriculture Organization of the United Nations and the United Nations Office for Coordination of Humanitarian Affairs; and bilateral/multilateral agreements and arrangements.

Assistance provided in the past included:

- Provision, by the IAEA, of official information to requesting States about a nuclear or radiological emergency;

- Provision, by States and the IAEA, of technical advice on emergency planning, preparedness and response;

- Provision, by States and the IAEA, of means to facilitate the implementation of: a) radiological surveys; b) source recovery; and c) in-situ verification of radiological conditions and the respective technical advice;

- Provision, by States and the IAEA, of medical advice and assistance in cases of a real or suspected radiation exposure.

In order to meet States Parties' obligations and the IAEA functions in relation to the Assistance Convention it has been recognised that appropriate mechanisms need to be organized. The Response Assistance Network (RANET) is intended, inter alia, to strengthen the worldwide capability to provide assistance and advice and/or to coordinate the provision of assistance as specified within the framework of this Convention including nuclear or radiological incidents.

2.2. Objectives of RANET

The aim of RANET is to facilitate:

- The provision of requested international assistance;

- The harmonization of emergency assistance capabilities; and

- The relevant exchange of information and feedback of experience.

In addition, RANET complements other IAEA initiatives to promote emergency preparedness and response among its Member States in accordance with the Safety Requirements GS-R-2 [3].

2.3. Concept of RANET

RANET is designed to provide a compatible and integrated system for the provision of international assistance to minimise the actual or potential radiological consequences of an incident or emergency for health[2], environment and property.

RANET serves to facilitate response to specific requests for assistance in accordance with the Assistance Convention and also applies to nuclear and radiological incidents. However, it does not affect the co-operation arrangements defined in any bilateral and/or multilateral agreements between States.

[2] The in-depth diagnosis, treatment, rehabilitation and follow-up of overexposed persons are addressed within the framework of the World Health Organization, which has established the network of collaborating centres for radiation emergency medical preparedness and assistance (REMPAN).

2.4. Scope of RANET

RANET is a system for providing timely assistance in the following areas: advisory, assessment and evaluation, monitoring and recovery. These areas of assistance would be applied in nuclear accidents or radiological emergencies[3] in the context of the Early Notification and Assistance Conventions, in nuclear or radiological incidents[4], and where the radiological consequences exceed a State's response capabilities.

2.5. Responsibilities within RANET

2.5.1. Requesting State

The requesting State, in accordance with Article 3 of the Assistance Convention, is responsible for the overall direction, support and supervision of any assistance within its territory. In addition, the requesting State is expected to:

- Identify and evaluate nuclear accidents and radiological emergencies or other nuclear or radiological events;
- Notify the IAEA's Incident and Emergency Centre (IEC) of an event that may have actual or potential radiological consequences for another State;
- Submit, if deemed appropriate, an official request for assistance to the IAEA;
- Participate in the development of the Assistance Action Plan for the requested assistance and accept the proposed Assistance Action Plan for implementation;
- Ensure that the implementation of the Assistance Action Plan will be conducted in a safe and secure manner; and
- Provide, as necessary, technical, financial, diplomatic, organizational, and logistical support as designated in the Assistance Action Plan for the requested assistance.

2.5.2. Member States' Resources

Member States are expected, within the limits of their capabilities, to identify qualified experts, equipment, and materials that could be made available to assist another State in a nuclear or radiological incident or emergency. These experts, equipment, and materials comprise of the Member State's National Assistance Capabilities (NAC) that can be activated by a State's CA(A) to provide assistance either by deploying or from an external base.

---

[3] Related to any nuclear reactor wherever it is located; any nuclear fuel cycle facility; any radioactive waste management facility; the transport and storage of nuclear fuels or radioactive wastes; the manufacture, use, storage, disposal and transport of radioisotopes for agricultural, industrial, medical and related scientific and research purposes; and the use of radioisotopes for power generation in space objects.

[4] For example, involving loss, unauthorized removal, misuse or abuse of radioactive/nuclear material; involving health effects and provision of medical care; involving spill or spread of radioactive material.

The CA(A) is expected to:

- Formally identify and maintain NAC resources to be included in the RANET;
- Provide periodic information on continued availability of NAC resources;
- Ensure that appropriately qualified staff are maintained for NAC resources;
- Inform the IEC of resources available for activation;
- Place NAC resources on standby, if requested;
- Participate in the development of the Assistance Action Plan including the identification of an Assistance Mission Leader and Joint Assistance Team Chairperson, as appropriate, in coordination with all parties;
- Provide on-scene and/or External Based Support assistance according to the Assistance Action Plan;
- Identify any terms, especially financial, for the provision of assistance;
- Ensure coordination with the requesting State, IEC, and any External Based Support;
- Demobilize NAC resources upon termination; and
- Participate, as appropriate, in IAEA meetings concerning the RANET.

Member States participating in RANET are expected to designate a NAC Coordinator. The NAC Coordinator is expected to ensure that these tasks are carried out as appropriate.

2.5.3. The International Atomic Energy Agency

In the framework of the RANET the IAEA's IEC:

- Evaluates the situation and may deploy an IAEA Field Response Team (FRT) to the requesting State to further assess the emergency/event;
- Recommends activation of specific RANET capabilities, if appropriate;
- Alerts appropriate National Warning Points (NWP) and requests coordination with Member States' CA(A);
- Ensures development of an Assistance Action Plan including identification of an Assistance Mission Leader or Joint Assistance Team Chairperson, as appropriate, in coordination with all parties;
- Liaises with the requesting State to reach agreement on the Assistance Action Plan and coordinates any proposed changes;
- Establishes and maintains communications links with Joint Assistance Team Command;
- Provides financial, organizational and logistics support, as appropriate;
- Declares the official termination of assistance; and
- Establishes follow-up mechanisms if deemed appropriate.

Additionally, the IEC serves as the focal point for the following RANET preparedness activities:

- Performs official registration of the Member State's NAC;

- Maintains the RANET Registry;
- Biennially requests Member State's CA certification of continued NAC resource availability;
- Periodically provides information on RANET's status and activities.

These roles are more clearly delineated in the following sections.

Section 3

3. CONCEPT OF OPERATIONS

The RANET consists of a network of Competent Authorities (CAs) that is capable and willing to provide, upon request, specialized assistance by appropriately trained, equipped and qualified personnel with the ability to respond in a timely and effective manner: to a) nuclear or radiological emergencies or b) other nuclear or radiological incidents.

3.1. Operations

Whether an incident or emergency originates on a State's territory or other area under its jurisdiction or control, a State may, in accordance with provisions of the Assistance Convention, request assistance from the IAEA.

Upon receiving an official assistance request, the IAEA through its IEC becomes the focal point for the facilitation and coordination of international assistance. The IEC assesses the request and provides initial advice to the requesting State. The IEC may deploy an IAEA Field Response Team (FRT) to perform an initial evaluation of the situation and to recommend whether activation of RANET capabilities is necessary. RANET response will be then tailored to the specific situation e.g. it may include deployment of assets as well as provision of advice or assistance from an external base.

If the activation of NAC resources is recommended, the IEC will alert the appropriate NWPs and request coordination with appropriate CAs. The CAs will inform the IEC regarding the availability of their resources for assistance and, if required, the resources will be placed on standby. This concept is outlined in Figure 1.

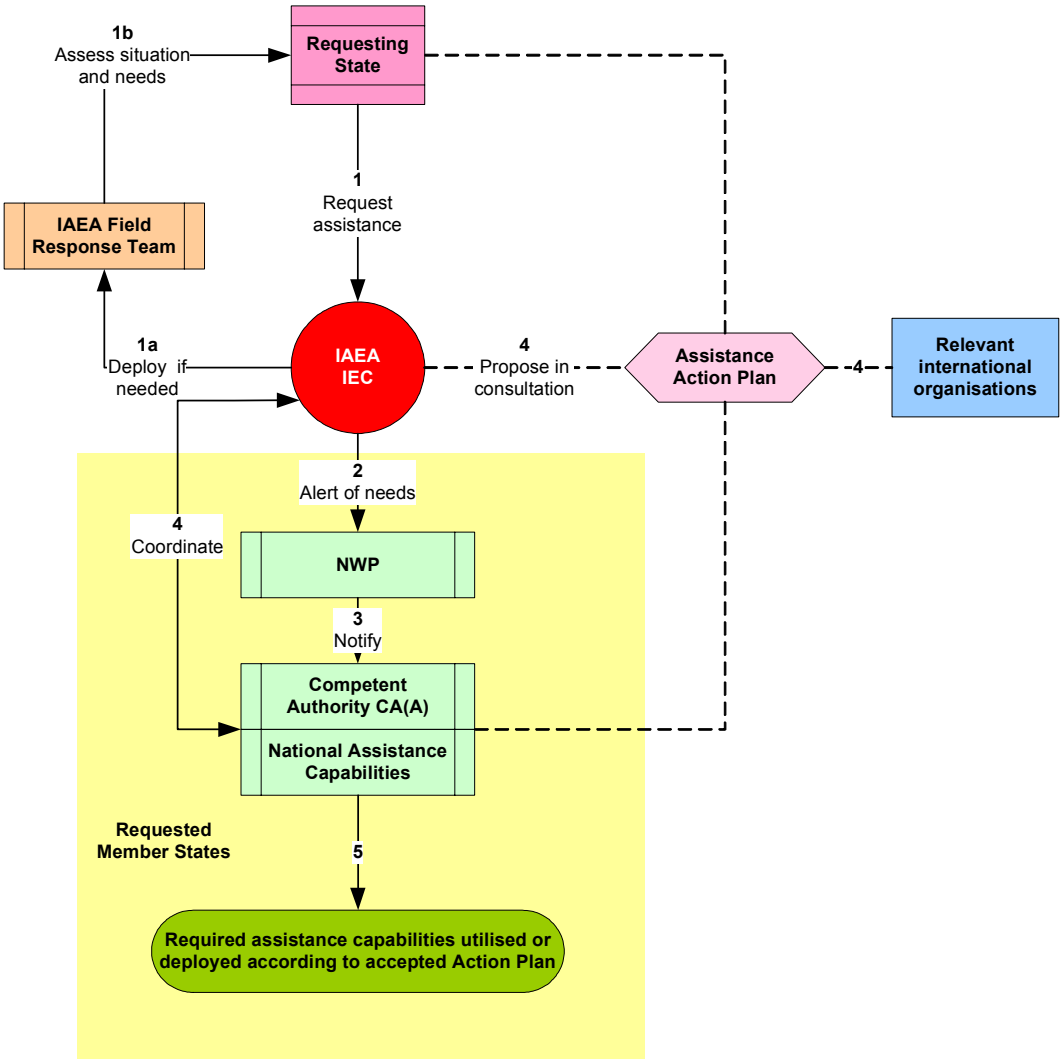

Figure 1: Outline of the RANET concept. State sends request for assistance to the IEC (1). The IEC may deploy an IAEA Field Response Team (1a) to assess situation and needs (1b). If activation of RANET assets is deemed necessary the IEC alerts NWPs (2), which notify Competent Authorities (Abroad) (3). CA(A)s then coordinate provision of assistance with the IEC (4). The IEC proposes an Assistance Action Plan in consultation with participating CA(A)s and international organisations (4). Required assistance capabilities are utilized or deployed according to accepted Assistance Action Plan (5).

3.2. Assistance Action Plan

An Assistance Action Plan for the requested assistance will be developed by the IEC in coordination with the requesting State, CAs providing assistance and other international organizations, as appropriate. This plan will specify the responses needed and whether they will be deployed and/or provided from an external base. The Assistance Action Plan should include all technical, financial, diplomatic, organizational and logistical aspects of the assistance to be provided. Templates for Assistance Action Plans are issued in Attachment 1 of this publication.

Upon acceptance of the Assistance Action Plan by the requesting State, the IEC will notify the assisting States' CAs and request activation of NAC resources. The

Assistance Action Plan should contain provisions for inclusion of other CA's NAC resources, if needed. Changes to the Assistance Action Plan must be coordinated with all parties before the changes are implemented.

3.3. NAC activation

NAC activation could involve one or more of the following: an Assistance Mission, a Field Assistance Team (FAT) as part of the Joint Assistance Team (JAT) and/or an External Based Support. The type of assistance will be specified in the Assistance Action Plan. The following defines different types of capabilities that can be activated.

3.3.1. Assistance Mission

The Assistance Mission consists of a group of qualified experts to address nuclear or radiological incidents providing advice, assessment, training, medical, monitoring or other specialized assistance. It can also be an evaluation, assessment, or fact-finding mission. The exact nature of the Assistance Mission will be specified in the Assistance Action Plan developed and agreed upon for that mission.

A team leader, who is identified and agreed upon before deployment, leads the Assistance Mission. The team leader is responsible for all on-scene assistance activities and ensures coordination with the requesting State, IEC and any External Based Support.

The concept of an Assistance Mission is outlined in Figure 2.

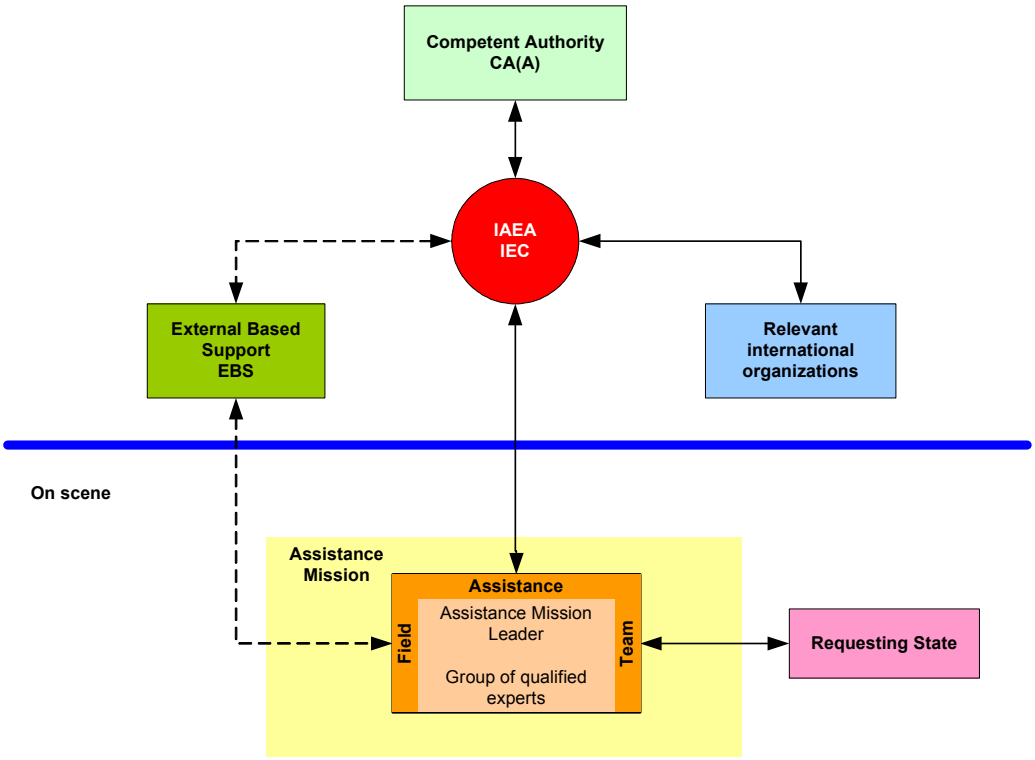

Figure 2: The concept of an Assistance Mission.

3.3.2. Joint Assistance Team (JAT)

A Joint Assistance Team is normally requested to address more complex assistance. The exact nature of the JAT will be specified in the Assistance Action Plan developed and agreed upon for that mission. The JAT consists of IAEA Field Response Team and all deployed FAT(s).

A Joint Assistance Team Command, composed of all FAT leaders and an IAEA FRT leader, manages all on-scene JAT assistance and ensures coordination with the requesting State, IEC and External Based Support.

A Chairperson, who is identified and agreed upon before deployment, heads the JAT Command.

The concept of JAT is outlined in Figure 3.

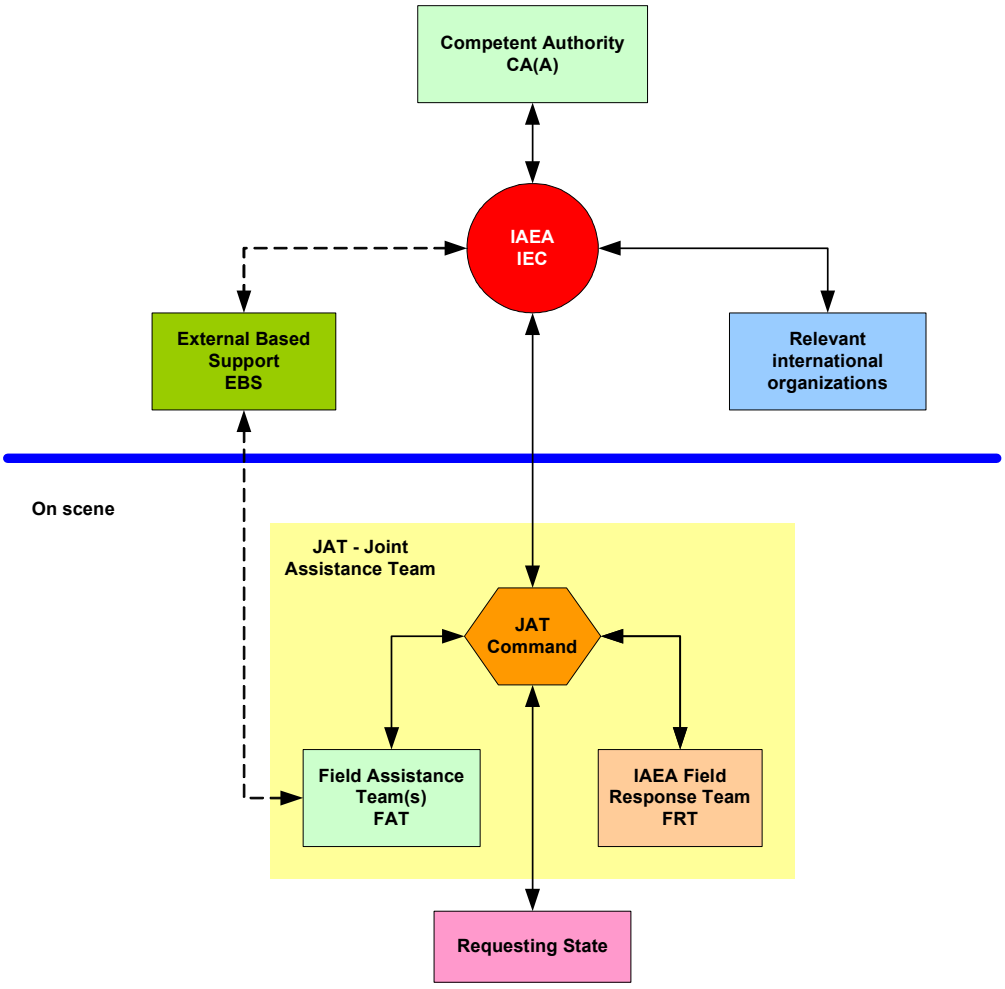

Figure 3: The concept of the Joint Assistance Team.

3.3.3. External Based Support

External Based Support is any support to an Assistance Mission, a JAT, IEC or to a requesting State. Such support can be expert advice on assessment, monitoring, analytical, and medical or other specialized emergency response function. This

support is not deployed to the event scene but is provided from another location, such as the donor country offices.

3.4. Field operational safety

The Assistance Mission leader or JAT Command should implement the activities set by the Assistance Action Plan. They are responsible to ensure that all activities are performed in a safe manner by following procedures, which at a minimum should meet appropriate IAEA safety standards. In an emergency response, priority will be placed on the safety of personnel and members of the public. Unsafe or possible unsafe conditions, operations and/or activities should not be conducted until JAT Command or the Assistance Mission leader have provided an acceptable, safe solution.

3.5. Assistance termination

The requesting State or the assisting party may at any time, after appropriate consultations and by notification in writing, request termination of assistance received or provided under the Assistance Convention. Once such a request has been made, the parties involved should consult with each other to make arrangements for the proper conclusion of the assistance.

Termination of assistance could be through any of the following:

1. All Assistance Action Plan tasks are certified as completed by the parties.

2. The requesting State may declare at any time the end of the requested IAEA assistance.

3. The IEC may declare at any time the end of assistance due to failure to resolve unsafe or unsecured conditions or practices, or the failure of the requesting State to comply with the Assistance Action Plan or JAT Command/NAC has completed all Assistance Action Plan items.

4. JAT Command/NAC considers individual Assistance Action Plan tasks completed. JAT Command can release certain assets as Assistance Action Plan tasks are completed.

Upon termination of assistance NAC resources will be demobilized. Partial demobilization of resources can occur as the individual Assistance Action Plan tasks are completed.

3.6. Financial arrangements

The financial principles of the response operations to a nuclear or radiological emergency must be in accordance with Article 7 of the Assistance Convention, and it is expected that these principles will also be applied in response to incidents.

Some financial support for RANET activities may be provided through the IAEA's regular budget or from other IAEA resources. The IAEA may cover the expenses for the initial mobilization and deployment of the Assistance Mission or Joint Assistance Team. If the IAEA cannot cover these initial expenses (for reasons of timing, for example), the CAs may cover the expenses, which may be reimbursed at a later stage.

It is expected that the State that is a member of RANET will provide financial support to maintain its national preparedness and response capabilities that may be available for any international assistance.

States are responsible for maintaining basic insurance for, or otherwise assume financial liability, for responders and equipment that they deploy. The IAEA assumes no liability for personnel or equipment.

Section 4

4. NATIONAL ASSISTANCE CAPABILITIES

4.1. Competencies of the NAC

To ensure an effective RANET, NAC resources of the States should be able to provide the following functional elements: advice, assessment and evaluation, monitoring and recovery.

The general tasks are:

1. To assess the current event;
2. To predict possible evolution of the radiological situation;
3. To provide technical advice as appropriate;
4. To initiate stabilization activities, including, where appropriate, source recovery;
5. To provide medical advice and/or consultation, medical assistance as necessary and advice on public health; and
6. To provide laboratory analysis, modelling and prognosis.

The following will support the performance of these tasks[5].

4.1.1. Aerial survey

Functions

- To detect, locate and identify radioactive material or lost or orphan sources over a wide area; and/or
- To obtain information on ground contamination over a wide area.

[5] See Attachment 3 for specific technical guidelines on equipment and other resources.

Resources An airborne detection system (radionuclide specific and/or dose rate) and a ground based capability for analysis and evaluation.

Expected output Detection, location and identification of radioactive material(s) or lost or orphan radiation source(s) and/or measured data, such as ground contamination, dose rates and integrated doses that can be displayed on contour maps.

Mode of utilization
Deployed: The Field Assistance Team.
External support: Analysis and evaluation (optional).

Application Radiological survey over a wide area.

4.1.2. Radiation monitoring

Functions

- To search for source(s) by ground survey;
- To monitor area(s) by ground survey;
- To detect, locate and demarcate contaminated area(s) or area(s) with elevated dose rates and to perform sampling if necessary;
- To identify a radionuclide;
- To measure dose rates by ground survey;
- To identify the need for immediate protective actions, if necessary; and
- To monitor personnel, equipment and other objects for external contamination.

Resources Hand held radiation survey instruments and radionuclide identifiers and/or vehicle-borne dose rate and/or radionuclide identification survey system; sampling equipment.

Expected output Detection, location and identification of lost or orphan radiation source(s) and/or measured data, such as ground contamination, dose rates and integrated doses that can be displayed on contour maps; detection and location of external contamination on persons, equipment and objects.

Mode of utilization
Deployed: The Field Assistance Team.
External support: Survey evaluation (optional).

Application Situations for which elevated levels of dose rate or contamination are suspected.

4.1.3. Environmental measurements

Functions

- To identify and quantify specific radionuclides in the environment;
- To sample environmental media;
- To prepare samples for measurement; and
- To measure concentration of radionuclide(s) in samples.

Resources In-situ gamma ray spectrometry system; laboratory spectrometry systems (possibly mobile); hand held radiation survey instruments; sampling (and sample preparation) equipment.

Expected output Identification of radionuclide composition and concentrations in various environmental samples.

Mode of utilization
Deployed: The Field Assistance Team.
External support: Laboratory analysis of samples and evaluation (optional).

Application Situation for which detailed analysis is needed of radionuclide composition and concentrations for ground contamination and/or environmental samples.

4.1.4. Source search/recovery

Functions
- To develop a plan for searching for a source or sources;
- To conduct the search operation on the basis of the plan;
- To provide advice on source recovery, transportation and secure/safe storage; and
- To organize/conduct source recovery operations, if necessary.

Resources Hand held radiation survey instruments; specialised tools for source handling.

Expected output Safety and security of source(s).

Mode of utilization
Deployed: The Field Assistance Team.
External support: Advice and planning for source search and recovery (optional).

Application Source(s) over which control has been lost.

4.1.5. Assessment and advice

Functions
- To assess and evaluate radiological consequences of an incident or emergency;
- To assess possible evolutions of an incident or emergency; and
- To give recommendations on the following subjects: monitoring strategies; mitigatory actions; protection of workers; management of medical response; protection of public health including urgent protective actions, agricultural countermeasures, countermeasures against ingestion and longer term protective actions; public information; recovery operations and management of waste resulting from an event.

Resources Plume dispersion models, dose assessment tools, data processing and presentation systems.

Expected output

Assessment of radiological consequences of an event; prognosis of the evolution of an event; expert advice/recommendations in areas of competence.

Mode of utilization

Deployed: The Field Assistance Team (optional).
External support: Developing recommendations, executing modelling tools and providing prognoses (optional).

Application

Nuclear or radiological incident or emergency.

4.1.6. Medical support

Functions

- To collect all information needed for analysis of medical consequences;
- To recommend adequate analysis;
- To advise and/or manage the collection of adequate samples (if required);
- To achieve specialized radiopathology consultation including medical examination and interpretation of analysis;
- To provide advice and recommend treatment, if necessary;
- To provide specific drugs, if necessary, and
- To recommend and possibly coordinate the transfer of the patient(s) to a specialized centre(s) outside the requesting State, in consideration of the potential impact on the patient's psychological status[6] (if required).

Resources

Medical instrumentation and drugs as necessary.

Expected output

Adequate medical care for overexposed and/or contaminated patients; analysis of medical consequences.

Mode of utilization

Deployed: The Field Assistance Team to the event scene or the location of the patients (optional).
External support: Support in patients' treatment and/or advice; treatment of patients (optional).

Application

Cases of overexposure and/or contamination (externally and/or internally) and cases in which medical care is needed for persons with: (1) clinical signs and symptoms of acute radiation syndrome, (2) external contamination, (3) internal contamination, (4) local radiation injuries, and/or (5) combined injuries (radiation injuries plus conventional injuries).

4.1.7. Public health protection

Functions

- To provide advice and recommend actions if necessary for the prevention of further radiation exposures to the population; and
- To provide advice on public health actions.

[6] The written informed consent of the patient(s) is required prior to transferal to another country.

Resources Well-qualified personnel in public health issues.

Expected output Advice and recommendation on public health protection; public health follow-up (epidemiology).

Mode of utilization

Deployed: The Field Assistance Team (optional).
External support: Advice and recommendations.

Application Suspected or actual exposure to radiation when public health actions may be warranted.

4.1.8. Biodosimetry

Functions

- To obtain and prepare appropriate samples (blood, bone or tooth enamel);
- To handle samples in a timely manner; and
- To conduct sample analysis and evaluation (data interpretation).

Resources For cytogenetic-based biodosimetry: cell culture facility; microscope slides preparation well-established techniques; microscopes, reference curves; for Electron Paramagnetic Resonance (EPR) biodosimetry: counting instrumentation.

Expected output Dose estimates obtained through cytogenetic-based biodosimetry and EPR dosimetry; prepared and archived biodosimetry samples cross-referenced to specific patients.

Mode of utilization

Deployed: The Field Assistance Team (optional).
External support: Laboratory analysis, EPR dosimetry.

Application Suspected or actual exposure to radiation requiring dose evaluation by biological dosimetry.

4.1.9. Internal dose assessment

Function

- To identify radionuclides giving rise to internal contamination;
- To assess the level and location of internal contamination;
- To estimate the reduction of internal contamination by decorporation; and
- To interpret the data in terms of committed effective dose and risks using appropriate models.

Resources Whole body counter(s), organ counter(s), wound counter(s); dose assessment model(s) endorsed by the IAEA or the ICRP; individual retention functions.

Expected output Assessments of committed effective dose and dose to critical organs.

Mode of utilization	*Deployed:*	The Field Assistance Team (optional).
	External support:	Laboratory analysis, dose assessment.

Application Internally contaminated individual(s).

4.1.10. Bioassay

Function

- To identify and determine levels of specific radionuclides in excreta and in other biological materials such as nasal mucus, hair, blood;
- To interpret the data in terms of committed effective dose, using appropriate models; and
- To interpret data during decorporation treatment, evaluate the efficiency of treatment and to assess consequent committed doses.

Resources Counting instruments; hand held radiation survey instruments; dose assessment model(s) endorsed by the IAEA or the ICRP; individual retention functions.

Expected output Assessed levels of specific radionuclides in biological samples and estimates of committed effective dose.

Mode of utilization	*Deployed:*	The Field Assistance Team (optional).
	External support:	Analysis, advice, dose assessment (optional).

Application Internally contaminated individual(s).

4.1.11. Histopathology

Function

- To obtain the appropriate tissue samples through biopsy or autopsy procedures;
- To prepare samples for histopathological analysis; and
- To conduct analysis and evaluation of the samples.

Resources Biopsy and/or autopsy instruments, histopathology laboratory

Expected output Timely and detailed radiopathological evaluation; prepared and archived radiopathological samples cross-referenced to specific individuals.

Mode of utilization	*Deployed:*	The Field Assistance Team (optional).
	External support:	Sample analysis and evaluation.

Application Accidental exposure of individuals requiring radiopathological evaluation.

4.1.12. Dose reconstruction

Function

- To collect information needed for dose reconstruction; and
- To conduct dose reconstruction with special attention to critical organs.

Resources

Dose assessment tool(s) and model(s).

Expected output

Estimates of external and internal dose by all exposure pathways and of dose distribution throughout the body and doses to critical organs.

Mode of utilization

Deployed: The Field Assistance Team (optional).
External support: Dose reconstruction.

Application

Exposure of individual(s).

4.2. Guidelines for the NAC

Each CA(A) is responsible for ensuring that NAC responding personnel are qualified to perform the functions and duties they are assigned. The CA(A) is expected to ensure that responders are equipped with all items necessary for the efficient performance of emergency tasks in compliance with Attachment 3.

Responders must use appropriate methods and procedures for all emergency tasks, medical management and related activities within its competence, including monitoring, dose assessment, personnel protection, sampling, sample handling and preparation, estimation of uncertainty of measurements and analysis of results.

Where possible, methods selected should be consistent with IAEA publications [6–8].

4.3. Training, drills and exercises

In addition to their national training, NAC members must be trained on and be aware of international guidelines and other aspects of international assistance and be prepared to respond.

Effective drills and exercises focusing on the international aspects of assistance should be developed and conducted as appropriate by the participating organizations of the NAC.

When possible and appropriate, participating organizations of NAC should participate in international exercises such as CONVEX or intercomparison exercises.

4.4. Registration

4.4.1. Prerequisites

The following are prerequisites for the RANET registration:

a) The State or International Organisation must be a Party to the Assistance Convention.

b) The State's Competent Authority (Abroad) must complete and submit the application for registration.

4.4.2. Information needed for registration

Parties should provide the following information:

a) Statement of endorsement by the State Competent Authority (Abroad);

b) Information on resources and areas of expertise of the NAC. This may include a nominal list of generalized experience and equipment lists, a statement of ability, quality and timeline for deployment of FAT and activation of External Based Support.

The application for the registration should be sent to the IAEA through official channels.

4.4.3. Registration update

If resources and areas of expertise undergo significant changes, the IAEA's IEC must be immediately notified.

Details of the RANET Registry and instructions how to register are presented in Attachment 2.

References

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Legal Series No. 14, IAEA, Vienna (1987).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL LABOUR ORGANISATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, IAEA Safety Series No. 115, IAEA, Vienna (1996).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL LABOUR ORGANISATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UN OFFICE FOR THE CO-ORDINATION OF HUMANITARIAN AFFAIRS, WORLD HEALTH ORGANIZATION, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Requirements No. GS-R-2, IAEA, Vienna (2002).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency, EPR-METHOD 2003, IAEA, Vienna (2003).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Intervention Criteria in a Nuclear or Radiation Emergency, IAEA Safety Series No. 109, IAEA, Vienna (1994).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Assessment Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA, Vienna (1997).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Assessment and Response during a Radiological Emergency, IAEA-TECDOC-1162, IAEA, Vienna (2000).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Procedures for Monitoring in a Nuclear or Radiological Emergency, IAEA-TECDOC-1092, IAEA, Vienna (1999).

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Planning and Preparedness for Accidents Involving Radioactive Materials Used in Medicine, Industry, Research and Teaching, IAEA Safety Series No. 91, IAEA, Vienna (1989).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), IAEA Safety Standards Series No. TS-R-1, IAEA, Vienna (2000).

[11] INTERNATIONAL ATOMIC ENERGY AGENCY, Explanatory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (1985 Edition) – Second Edition (As Amended 1990), IAEA Safety Series No. 7, IAEA, Vienna (1990).

[12] INTERNATIONAL ATOMIC ENERGY AGENCY, Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (1985 Edition), Third Edition (As Amended 1990), IAEA Safety Series No. 37, IAEA, Vienna (1990).

[13] INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Planning and Preparedness for Re-entry of a Nuclear Powered Satellite, IAEA Safety Series No. 119, IAEA, Vienna (1996).

[14] INTERNATIONAL ATOMIC ENERGY AGENCY, Assessment and Treatment of External and Internal Radionuclide Contamination, IAEA-TECDOC-869, IAEA, Vienna (1996).

[15] INTERNATIONAL ATOMIC ENERGY AGENCY, Medical Handling of Accidentally Exposed Individuals, IAEA Safety Series No. 88, IAEA, Vienna (1988).

[16] INTERNATIONAL ATOMIC ENERGY AGENCY, Diagnosis and Treatment of Radiation Injuries, IAEA Safety Reports Series No. 2, IAEA, Vienna (1998).

[17] INTERNATIONAL ATOMIC ENERGY AGENCY, Planning the Medical Response to Radiological Accidents, IAEA Safety Reports Series No. 4, IAEA, Vienna (1998).

[18] INTERNATIONAL ATOMIC ENERGY AGENCY, Emergency Notification and Assistance Technical Operations Manual, EPR-ENATOM 2004, IAEA, Vienna (2004).

[19] INTERNATIONAL ATOMIC ENERGY AGENCY, Joint Radiation Emergency Management Plan of the International Organizations, EPR-JPLAN 2004, IAEA, Vienna (2004).

[20] WORLD HEALTH ORGANIZATION, Proc. Seventh Co-ordination Meeting of World Health Organization Centres in Radiation Emergency Medical Preparedness and Assistance Network — REMPAN, WHO/IRD, Rio de Janeiro (1997).

CONTRIBUTORS TO DRAFTING AND REVIEW

Aaltonen, H.	Radiation & Nuclear Safety Authority (STUK), Finland
Allenet-Le Page, B.	Institut de Radioprotection et de Sûreté Nucléaire (IRSN) France
Crick, M.	International Atomic Energy Agency
Buglova, E.	International Atomic Energy Agency
Dos Santos, R.	Comissao Nacional de Energia Nuclear do Brasil, Brazil
Galer, R.	International Emergency Management and Co-operation, NNSA-Office of Defense Nuclear Nonproliferation, U.S. Department of Energy (USDOE), United States of America
Gayral, J. P.	Commissariat à l'Energie Atomique (CEA), France
Gravier, S.	Chargee d'affaires, Direction Générale de la Sûreté Nucléaire et de la Radioprotection, France
Heinrich, A.	International Emergency Management and Co-operation, NNSA-Office of Defense Nuclear Nonproliferation, U.S. Department of Energy (USDOE), United States of America
Hug, M.	International Atomic Energy Agency
Jerez Veguería, P.	Especialista Principal, Centro Nacional de Seguridad Nuclear de Seguridad Nuclear (CNSN), Cuba
Martinčič, R.	International Atomic Energy Agency
McClelland, V.	International Emergency Management and Co-operation, NNSA-Office of Defense Nuclear Nonproliferation, U.S. Department of Energy (USDOE), United States of America
Muralidhar K.	Department of Atomic Energy Chatrapati Shivaji Maharaj Marg, India

Nogueira de Oliveira, C.	International Atomic Energy Agency
Tóth, K.	Hungarian Atomic Energy Authority (HAEA), Hungary
Ugletveit, F.	Norwegian Radiation Protection Authority, Norway

No. 20, August 2005

IAEA
International Atomic Energy Agency

Where to order IAEA publications

In the following countries IAEA publications may be purchased from the sources listed below, or from major local booksellers. Payment may be made in local currency or with UNESCO coupons.

Australia
DA Information Services, 648 Whitehorse Road, MITCHAM 3132
Telephone: +61 3 9210 7777 • Fax: +61 3 9210 7788
Email: service@dadirect.com.au • Web site: http://www.dadirect.com.au

Belgium
Jean de Lannoy, avenue du Roi 202, B-1190 Brussels
Telephone: +32 2 538 43 08 • Fax: +32 2 538 08 41
Email: jean.de.lannoy@infoboard.be • Web site: http://www.jean-de-lannoy.be

Canada
Bernan Associates, 4611-F Assembly Drive, Lanham, MD 20706-4391, USA
Telephone: 1-800-865-3457 • Fax: 1-800-865-3450
Email: order@bernan.com • Web site: http://www.bernan.com

Renouf Publishing Company Ltd., 1-5369 Canotek Rd., Ottawa, Ontario, K1J 9J3
Telephone: +613 745 2665 • Fax: +613 745 7660
Email: order.dept@renoufbooks.com • Web site: http://www.renoufbooks.com

China
IAEA Publications in Chinese: China Nuclear Energy Industry Corporation, Translation Section, P.O. Box 2103, Beijing

Czech Republic
Suweco CZ, S.R.O. Klecakova 347, 180 21 Praha 9
Telephone: +420 26603 5364 • Fax: +420 28482 1646
Email: nakup@suweco.cz • Web site: http://www.suweco.cz

Finland
Akateeminen Kirjakauppa, PL 128 (Keskuskatu 1), FIN-00101 Helsinki
Telephone: +358 9 121 41 • Fax: +358 9 121 4450
Email: akatilaus@akateeminen.com • Web site: http://www.akateeminen.com

France
Form-Edit, 5, rue Janssen, P.O. Box 25, F-75921 Paris Cedex 19
Telephone: +33 1 42 01 49 49 • Fax: +33 1 42 01 90 90 • Email: formedit@formedit.fr

Lavoisier SAS, 145 rue de Provigny, 94236 Cachan Cedex
Telephone: + 33 1 47 40 67 02 • Fax +33 1 47 40 67 02
Email: romuald.verrier@lavoisier.fr • Web site: http://www.lavoisier.fr

Germany
UNO-Verlag, Vertriebs- und Verlags GmbH, Am Hofgarten 10, D-53113 Bonn
Telephone: + 49 228 94 90 20 • Fax: +49 228 94 90 20 or +49 228 94 90 222
Email: bestellung@uno-verlag.de • Web site: http://www.uno-verlag.de

Hungary
Librotrade Ltd., Book Import, P.O. Box 126, H-1656 Budapest
Telephone: +36 1 257 7777 • Fax: +36 1 257 7472 • Email: books@librotrade.hu

India
Allied Publishers Group, 1st Floor, Dubash House, 15, J. N. Heredia Marg, Ballard Estate, Mumbai 400 001,
Telephone: +91 22 22617926/27 • Fax: +91 22 22617928
Email: alliedpl@vsnl.com • Web site: http://www.alliedpublishers.com

Bookwell, 2/72, Nirankari Colony, Delhi 110009
Telephone: +91 11 23268786, +91 11 23257264 • Fax: +91 11 23281315
Email: bookwell@vsnl.net

Italy
Libreria Scientifica Dott. Lucio di Biasio “AEIOU”, Via Coronelli 6, I-20146 Milan
Telephone: +39 02 48 95 45 52 or 48 95 45 62 • Fax: +39 02 48 95 45 48

Japan
Maruzen Company, Ltd., 13-6 Nihonbashi, 3 chome, Chuo-ku, Tokyo 103-0027
Telephone: +81 3 3275 8582 • Fax: +81 3 3275 9072
Email: journal@maruzen.co.jp • Web site: http://www.maruzen.co.jp

Korea, Republic of
KINS Inc., Information Business Dept. Samho Bldg. 2nd Floor, 275-1 Yang Jae-dong SeoCho-G, Seoul 137-130
Telephone: +02 589 1740 • Fax: +02 589 1746
Email: sj8142@kins.co.kr • Web site: http://www.kins.co.kr

Netherlands
De Lindeboom Internationale Publicaties B.V., M.A. de Ruyterstraat 20A, NL-7482 BZ Haaksbergen
Telephone: +31 (0) 53 5740004 • Fax: +31 (0) 53 5729296
Email: books@delindeboom.com • Web site: http://www.delindeboom.com

Martinus Nijhoff International, Koraalrood 50, P.O. Box 1853, 2700 CZ Zoetermeer
Telephone: +31 793 684 400 • Fax: +31 793 615 698 • Email: info@nijhoff.nl • Web site: http://www.nijhoff.nl

Swets and Zeitlinger b.v., P.O. Box 830, 2160 SZ Lisse
Telephone: +31 252 435 111 • Fax: +31 252 415 888 • Email: infoho@swets.nl • Web site: http://www.swets.nl

New Zealand
DA Information Services, 648 Whitehorse Road, MITCHAM 3132, Australia
Telephone: +61 3 9210 7777 • Fax: +61 3 9210 7788
Email: service@dadirect.com.au • Web site: http://www.dadirect.com.au

Slovenia
Cankarjeva Zalozba d.d., Kopitarjeva 2, SI-1512 Ljubljana
Telephone: +386 1 432 31 44 • Fax: +386 1 230 14 35
Email: import.books@cankarjeva-z.si • Web site: http://www.cankarjeva-z.si/uvoz

Spain
Díaz de Santos, S.A., c/ Juan Bravo, 3A, E-28006 Madrid
Telephone: +34 91 781 94 80 • Fax: +34 91 575 55 63 • Email: compras@diazdesantos.es
carmela@diazdesantos.es • barcelona@diazdesantos.es • julio@diazdesantos.es
Web site: http://www.diazdesantos.es

United Kingdom
The Stationery Office Ltd, International Sales Agency, PO Box 29, Norwich, NR3 1 GN
Telephone (orders): +44 870 600 5552 • (enquiries): +44 207 873 8372 • Fax: +44 207 873 8203
Email (orders): book.orders@tso.co.uk • (enquiries): book.enquiries@tso.co.uk • Web site: http://www.tso.co.uk

On-line orders:
DELTA Int. Book Wholesalers Ltd., 39 Alexandra Road, Addlestone, Surrey, KT15 2PQ
Email: info@profbooks.com • Web site: http://www.profbooks.com

Books on the Environment:
Earthprint Ltd., P.O. Box 119, Stevenage SG1 4TP
Telephone: +44 1438748111 • Fax: +44 1438748844
Email: orders@earthprint.com • Web site: http://www.earthprint.com

United Nations (UN)
Dept. I004, Room DC2-0853, First Avenue at 46th Street, New York, N.Y. 10017, USA
Telephone: +800 253-9646 or +212 963-8302 • Fax: +212 963-3489
Email: publications@un.org • Web site: http://www.un.org

United States of America
Bernan Associates, 4611-F Assembly Drive, Lanham, MD 20706-4391
Telephone: 1-800-865-3457 • Fax: 1-800-865-3450
Email: order@bernan.com • Web site: http://www.bernan.com

Renouf Publishing Company Ltd., 812 Proctor Ave., Ogdensburg, NY, 13669
Telephone: +888 551 7470 (toll-free) • Fax: +888 568 8546 (toll-free)
Email: order.dept@renoufbooks.com • Web site: http://www.renoufbooks.com

Orders and requests for information may also be addressed directly to:

Sales and Promotion Unit, International Atomic Energy Agency
Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria
Telephone: +43 1 2600 22529 (or 22530) • Fax: +43 1 2600 29302
Email: sales.publications@iaea.org • Web site: http://www.iaea.org/books

06-10641

EPR-
RANET
2006

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA