

Development of the Triage, Monitoring and Treatment Handbook for Members of the Public Affected by Radiological Terrorism - A European Response

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ABSTRACT

European national emergency response plans have long been focused on accidents at nuclear power plants. Recently, the possible threats by disaffected groups have shifted the focus to being prepared also for malevolent use of radiation that are aimed at creating disruption and panic in the society. The casualties will most likely be members of the public.

According to the scenario, the number of affected people can vary from a few to mass casualties. The radiation exposure can range from very low to substantial, possibly combined with conventional injuries. There is a need to develop practicable tools for the adequate response to such acts and more specifically to address European guidelines for triage, monitoring and treatment of exposed people.

Although European countries have developed emergency response plans for nuclear accidents they have not all made plans for handling malevolent use of radioactive material. Indeed, there is a need to develop practical guidance on emergency response and medical treatment of the public affected by malevolent acts. Generic guidance on this topic has been published by international organisations. They are, however, not operational documents to be used in emergency situations. The Triage, Monitoring and Treatment (TMT) Handbook aims to strengthen the European ability to efficiently respond to malevolent acts in terms of protecting and treating exposed people. Part of the Handbook is also devoted to public information and communication issues which would contribute to public reassurance in emergency situations.

The Handbook will be drafted by European and international experts before it is circulated to all emergency response institutions in Europe that would be a part of the handling of malevolent acts using radioactive material. The institutions would be given a 6 months consultation time with encouragement to test the draft Handbook in national exercises. A workshop will allow feedback from these end users on the content, structure and usefulness of the Handbook before a final version is produced.

In order to achieve the project's objectives a consortium has been drawn together including, Belgian Nuclear Research Centre, the Norwegian Radiation Protection Authority, Radiation and Nuclear Safety Authority of Finland, the UK Health Protection Agency, the Central Laboratory for Radiological Protection of Poland and the World Health Organisation. Enviros Consulting is acting as the technical secretariat for the project.

The Handbook will aim to harmonise the approaches to handling malevolent acts across Europe. This harmonisation will have an added value on the public confidence in authorities since differing approaches in neighbouring countries could lead to public confusion and mistrust.

INTRODUCTION

European national emergency response plans have long been focused on accidents at nuclear power plants. This has resulted in well developed, reviewed and exercised plans taking place at these fixed facilities. The evolution of nuclear emergency planning has led to the refinement of response plans away from fixed nuclear sites, such as the accidents involving the transport of radioactive material. The magnitude of these events whilst generally smaller due to the smaller quantities of radioactive material involved pose their own problems due to the difficulties associated with prior planning for location specific factors, high density populations, etc. More recently, the possible threats by disaffected groups have shifted the focus to being prepared for malevolent use of radiation that

are aimed at creating disruption and panic in the society.

Scenarios that fall into this malevolent category host a whole range of issues that require consideration. Historically, the terms accident and emergency have been used interchangeably. Unfortunately, the political landscape has changed to such an extent that in an emergency situation the question “mistake or malicious” has to be asked. Whilst this may not render the actual response at an individual or operational level any differently, there are aspects in the strategic and tactical response that may vary. A whole host of questions are raised and need to be answered, in part to ensure the safety of the emergency responders.

In order to provide practical guidance for responders in the event of the malevolent use of radiation a programme of work has started to develop the Triage, Monitoring and Treatment Handbook (TMT Handbook). This paper reviews the progress on the first stage of the handbook and highlights some of the key aspects identified when trying to coordinate an international response to these events and provide an insight into the European approach to these issues.

REVIEW EXISTING GUIDANCE AND RESEARCH

There are a number of recent internationally recognised publications that have started to address some of the issues raised in responding to malevolent use of radiation, notably, ICRP Publication 96[1], protecting people against radiation in the event of a radiological attack. This document focuses protection criteria for responders and the public. There is a brief foray into Medical intervention the report does state that it does not make recommendations for therapeutic medical treatments of radiation injuries although there is some descriptions of therapies in the Annexes (B). However this is not in the form of an operational manual.

NCRP [2] provides an excellent review of the consequences to improvised nuclear devices (IND) and other malevolent uses of radiation. This assists in providing bounding estimates regarding the scenario and effects but again it is beyond its remit to consider the triage and treatment of people affected.

A number of IAEA publications [3, 4, 5, 6] including the recently published, advice to first responders[7] and the updated EPR-Medical [8] provides useful guidance on the generic treatment options available.

In addition to the published articles in journals on specific medical treatments [9, 10] there are a host of guidance and protocols produced at a national level, although there is a tendency towards individual, generic response.

EC Research Programmes

There are a number of research programmes currently being funded within the EC this includes:

- Coordination Action for Radiation Dosimetry (CONRAD)
- Treatment Initiatives after Radiological Accidents (TIARA)

The UK Health Protection Agency is a task in the EU/EURADOS-sponsored CONRAD project which aims to collect information on emergency personal monitoring methodologies in EU countries. This work will be extended to collect information on the strategic response. Links with this project will provide effective contacts with organisations that have responsibilities in this field, and will be an important source of information for the TMT Handbook.

The TIARA project focuses on provision of guidance on issues relating to efficacy of treatment. As its starting point, it assumes that monitoring measurements on people in the immediate phase have been completed, and in particular that bioassay results (i.e. whole body, urine or faecal measurements) are available. Furthermore, it is concerned only with scenarios that could result in levels of internal contamination that would justify treatment to remove radioactive material from the body (decorporation) and, perhaps most importantly, TIARA is firmly based in Research and development; specifically, the development of a dosimetric method to allow the identification of people who may require decorporation treatment, the review of scientific developments in research into new treatments, and the development of a new chelating agent for uranium.

It is therefore easy to distinguish the differences between the TIARA programme and the TMT handbook, notably, the TMT Handbook will:

- provide practicable guidelines on the management of people from the beginning of an incident involving the malevolent use of radiation or radioactive material

- consider scenarios that involve external irradiation, as well as those involving releases of radioactive material that could result in both external and internal contamination
- make use of existing knowledge and practice to address the specific problems raised by the potential malevolent use of radiation or radioactive material

THE NEED

Due to the focus on “accidental” releases much of the guidance is specifically focussed towards these issues. The “malicious” event is one that is relatively new to our consciousness and therefore there is relatively little established guidance available specific to this situation. Whilst there are numerous overlaps with accidental situations in terms of the public protection a number of specific issues need to be considered,

- How do you ensure the effective triage of members of the public exposed to radiation or radioactive materials?
- What are the best means of monitoring members of the public, what strategies are adopted at a national level and what resources are available?
- Which treatments options are available and offer the most effective response?

This is of particular significance in the malevolent event due to the potential for large numbers of people to be, or suspected to be, exposed. It is also apparent that whilst national plans have been developed to respond to these issues these have been, in the whole, developed in isolation. Any significant event could affect more than one country due to transboundary migration of contaminants, migration of people or transfer of goods.

Generic guidance on this topic has been published by international organisations. They are, however, not operational documents to be used in emergency situations. So whilst according to the scenario, the number of affected people can vary from a few to mass casualties; the radiation exposure can range from very low to substantial, possibly combined with conventional injuries. There is a need to develop practicable tools for the adequate response to such acts and more specifically to address European guidelines for triage, monitoring and treatment of exposed people. The aim of this project is to try and develop consistent guidance on the response to the malevolent use of radiation that affects the public.

AIMS AND OBJECTIVES

The TMT Handbook aims to strengthen the European ability to efficiently respond to malevolent acts in terms of protecting and treating exposed people. Part of the Handbook is also devoted to public information and communication issues which would contribute to public reassurance in emergency situations.

The objective of this project is to develop a harmonised approach for the effective and timely monitoring and treatment of populations exposed as a result of the malevolent use of radiation and radioactive material by utilising existent national and international guidelines in this manner. This is to:

1. ensure the protection of the public;
2. develop a common and consistent response and driving best practice, and
3. add value to former developments of national and European programmes.

The Handbook will aim to harmonise the approaches to handling malevolent acts across Europe. This harmonisation will have an added value on the public confidence in authorities since differing approaches in neighbouring countries could lead to public confusion and mistrust.

CONSORTIUM

The Handbook will be drafted by European and international experts and circulated to emergency response institutions in Europe that would play a part of the handling of malevolent acts using radioactive material. The institutions would be given a 6 months consultation time with encouragement to test the draft Handbook in national exercises. A workshop will allow feedback from these end users on the content, structure and usefulness of the Handbook before a final version is produced.

In order to achieve these objectives a project consortium has been drawn together including, Belgian Nuclear Research Centre, the Norwegian Radiation Protection Authority, Radiation and Nuclear Safety Authority of Finland,

the UK Health Protection Agency, the Central Laboratory for Radiological Protection of Poland and the World Health Organisation. Enviro Consulting is acting as the technical secretariat for the project.

Belgian Nuclear Research Centre (SCK•CEN)

SCK•CEN, is the Belgian Nuclear Research Centre being a foundation of public utility under the tutorial of the Belgian Federal Minister in charge of energy. The statutory mission gives the priority to research on problems of societal concern like safety of nuclear installations, Radiation protection, safe treatment and disposal of radioactive waste, fight against uncontrolled proliferation of fissile materials, education and training, etc.

In order to perform its research programme and to provide its services to industry and third parties, SCK•CEN operates several nuclear facilities, as well as emphasising its educational and training programmes such as coordinating the Belgian and initiated the European Nuclear Engineering Network, International School for Radiological Protection. SCK•CEN has a long tradition in the organisation of off site nuclear emergency response training courses, which in the past were sponsored by the European Commission Research and Training Programme, and thus plays a leading role in assisting the government in nuclear and radiological emergency response related issues.

Norwegian Radiation Protection Authority (NRPA)

NRPA is the Norwegian authority on radiation protection and emergency response. NRPA has been involved in numerous research projects and has good experience in arranging consensus meetings and conferences and will use their expertise in this field to ensure a good communication with end users throughout the project.

NRPA is chairing the National Competent Authorities' Coordination Group (NCACG), whose main role is to cooperate with the member states, to ensure successful implementation of the long term *International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies*.

Enviros Consulting Limited

Enviros is one of the UK's largest environmental consultancies and is highly respected on an international basis for environmental consultancy and software development. Enviro specialises in research development support, site characterisations and remediation, waste management, environmental impacts assessment, planning and permitting and specialist modelling and software services.

Enviros provides consultancy and support services in the nuclear sector to clients in the UK, Europe, Former Soviet Union, Japan and North America. Enviro's expertise is broad covering radiological emergency planning and response, radioactive waste safety assessment and regulatory support services. The Enviro team has been contributing to R&D in European projects and has considerable experience in providing technical secretariat services to a wide range of projects including regulatory support and European funded projects.

The Enviro team includes technical experts in radiation protection, radiation monitoring, emergency planning and response. These skills are augmented by strong project management, training and workshop facilitation skills.

Health Protection Agency (HPA)

The role of the Health Protection Agency (HPA) is to provide an integrated approach to protecting UK public health through the provision of support and advice to the National Health Service, local authorities, emergency services and the Department of Health. Advising on the protection of people in radiological emergencies is a fundamental part of the responsibilities of the Radiation Protection Division of the Health Protection Agency (HPA-RPD, formerly the National Radiological Protection Board (NRPB)).

HPA is responsible for the coordination of monitoring (both personal and environmental) in the UK following any accidental or deliberate release of radionuclides, and also has a significant operational capability for both environmental and personal monitoring. It plays a leading role in national emergency exercises and would play a major role in the national response to such an event.

World Health Organisation (WHO)

The World Health Organization is the United Nations specialized agency for health. The Radiation and Environmental Health Unit (RAD) of the Sustainable Development and Healthy Environments Cluster is involved in several key activities pertinent to the project, notably the coordination of the global Radiation Emergency Medical

Preparedness and Assistance Network (REMPAN). RAD develops, coordinates and disseminates science-based information and guidelines on all issues related to radiation emergency medicine.

RAD is the WHO focal point for the global system of the international response to nuclear and radiological accidents. This is implemented via 32 medical institutions members of REMPAN network, the bulk of which are located in the EU. REMPAN provides consultation and advise on preparedness and response to radiation emergencies to 192 MS of the WHO, assists in treatment of victims, long-term follow-up, research coordination, education and training.

Nuclear and Radiation Safety Authority (STUK)

STUK is a Finnish public agency, whose main objective is to prevent and limit the harmful effects of radiation. STUK is a safety authority for the use of nuclear energy and radiation. Emergency preparedness arrangements have been established within STUK for radiological and nuclear emergencies. Maintaining an effective preparedness for field and laboratory measurements in order to cope with abnormal radiation situations is an important part of research activities. Mobile systems as well as fixed stations for radiation monitoring are developed. In recent years STUK has successfully participated in tens of research projects financed by the European Union.

Central Laboratory Radiological Protection (CLRP)

The statutory responsibility of Central Laboratory for Radiological Protection (CLRP) of Poland is protection of general population, occupationally exposed persons, and the environment against the hazards of ionizing radiation. CLRP has been particularly involved in the national monitoring of radioactive contamination in foodstuffs and environmental components, offering assistance in a radiological emergency or nuclear accident, and supporting the countermeasures against illegal trafficking in nuclear and radioactive materials.

CLRP participated in several national and international research projects, prime among them were those sponsored by the European Union, by bilateral agreements between CLRP and Institute of Transuranium Elements in Karlsruhe (ITU), Germany. With the assistance of the ITU, under the PECO project (Pays Europe Centrale Orientale), CLRP has elaborated and implemented the handbook for the response to illicit trafficking, or inadvertent movement of nuclear and radioactive materials in Poland.

RESULTS

At this early stage in the project, 6 months into a 30 month programme, there are little reportable results. However, it is envisaged that the principles developed in this project, will contribute to the core of international standards applicable beyond the EU. This project also provides excellent opportunity for project outcomes to contribute to international standards and guidelines on emergency response.

One of the initial stages of the project was to carry out a strategic review of response capability of European countries to the threat of the malevolent use of radiation. This task was being co-ordinated by the Health Protection Agency, unfortunately many of these key staff have been deployed in a real life situation regarding the malevolent use of radiation in responding to the use of Polonium-210 to poison the former Russian citizen, Mr Letvenenko. There are of course many lessons that can be learnt from this incident that will be applied to the TMT handbook.

The development of bounding scenarios are also being developed from current and existing work. These are there to identify the range of scenarios to which the Handbook can be used and the reasonable limits that can be applied.

In trying to define the end-users of the handbook “Emergency Response Organisations with specific functions to plan, co-ordinate and execute the national, regional and/or local public-health and medical response for actual, or potential events of malevolent use of radiation.”

In addition we need to ensure there is a clear and defined event that triggers the use of the handbook, hence this handbook should be used where a possible malevolent event has occurred and use of radiation or radioactive contamination has either been confirmed or cannot be ruled out.

Draft Structure

A preliminary structure has been drafted, the current thinking is to structure the handbook in a time critical chronological order. The plan is to make a user friendly format with flow diagrams to guide the users through the appropriate stages with checklists and action plans to ensure the necessary steps are included. These sections will be augmented with more detailed guidance and notes in technical appendices.

Information dissemination

The consultation of emergency response institutions is a vital part of the project. Getting feedback on the content, structure and usefulness of the Handbook is imperative for producing a useful guidance. Hard copies of the Handbook are presumed to be published by the EC. Electronic copies of the final Handbook will be available free of charge on the project's web page. The web page will also be open to the public and important findings and reports will be posted here during the lifetime of the project.

Training is envisaged towards the end of the project. The training will be for both European participants and international participants through the WHO network.

It is believed that the consultation, workshop and training will raise awareness of the topic and the Handbook in many countries across Europe and also beyond.

CHALLENGES AND NEXT STEPS

The key challenges for this project are:

- to develop a useful operational handbook that is applicable at a strategic, tactical and operational level across a number of countries. Ensuring a sufficient level of detail to be useful without being overly prescriptive that might result in its exclusion from use in some areas.
- keeping up with the rapid developments in this field given the rapid developments that are taking place in a number of relevant disciplines. Since starting this project a number of publications have become available. However, to a certain extent this reinforces the need for a co-ordinated and harmonised approach as advocated by the TMT approach.

The next steps are:

- finalisation of the scenario data to provide a scoping boundaries for the rest of the project.
- dissemination of the questionnaire to obtain feedback on the strategic national response and develop national contact points
- initiation of the key sections of the draft handbook.

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