

expecting the unexpected

by Warren Stern and Elena Buglova

The IAEA's Incident and Emergency Centre helps prepare States to face radiological emergencies

The IAEA works with its partners worldwide to promote safe, secure and peaceful nuclear technologies.

The IAEA's Statute assigns functions to the Secretariat in relation to radiation emergencies, including fostering international cooperation in the area of emergency preparedness and response. The Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (often called the "Emergency Conventions") place specific legal obligations on the IAEA with regard to emergency preparedness and response.

In 2005, the IAEA established a fully integrated Incident and Emergency Centre (IEC) which acts as the global focal point for international preparedness, communication and response to nuclear and radiological incidents or emergencies irrespective of their cause. In this role, the IEC stands at the centre of coordinating effective and efficient activities worldwide. While emergency response capabilities have existed within the IAEA since concluding the Emergency Conventions in the 1980s, the decision to create an integrated Centre within the IAEA became more pressing with the growing use of nuclear applications worldwide as well as increasing concern over malicious use of nuclear or radioactive materials.

Today, the IEC provides around-the-clock assistance to States dealing with nuclear and radiological events. Under the Emergency Conventions, the IEC coordinates actions of global experts and efforts within the IAEA. It also helps coordinate the responses of States as well as other international organizations, such as the WHO (World Health Organization), FAO (Food and Agricultural Organization) or WMO (World Meteorological Organization) in case of a nuclear or radiological emergency.

Response to incidents and emergencies can involve exchange of information, provision of advice and/or coordination of field response. The IEC ensures that the IAEA's incident and emergency arrangements are fully operational, efficient and effective. This includes training a broad range of IAEA staff to respond to emergencies as well as training external experts.

In order to coordinate global response, the IEC hosts a Response Assistance Network (RANET) under which IAEA Member States and Parties to the Emergency Conventions register their response capabilities. This network aims to facilitate assistance in case of a nuclear or radiological incident or emergency in a timely and effective manner.

Strengthening Capabilities

A central focus of the Centre is helping States by continuously refining standards and guidance for strengthening preparedness. The IEC has developed practical tools and training programmes to assist in promptly applying standards; and organizes and supports a variety of training mechanisms and exercises. The IEC continually updates documents that can be used by governmental authorities.

Through regional and national training courses using standardized teaching materials, the IEC exchanges information and assists in applying guidance. These include international requirements for emergency preparedness, guidance for first responders, medical responders, radiological assessors and national planners preparing exercises. The Centre also conducts appraisal missions (Emergency Preparedness Review missions) to IAEA Member States to

help develop national capabilities for response consistent with international requirements.

Preparing First Responders

The IEC trains and prepares first responders (i.e. police, fire fighters, medical) for radiological incidents and emergencies, including scenarios involving terrorist acquisition and use of radioactive materials. Radiological emergencies continue to occur throughout the world in unexpected places—often involving lost, stolen, damaged, discarded or found sources. Experience shows that even relatively minor radiological emergencies can have a severe social, economic and psychological impact nationally and internationally. In order to minimize these impacts, effective action by first responders is essential.

In almost all radiological emergencies, first responders and local officials (supported by national officials), perform the initial response. Since radiological emergencies are rare, local responders have little or no experience in dealing with this type of emergency and inexperience often leads to an inadequate response. The level of preparedness required at the local and national levels to respond adequately to radiological emergencies is modest.

The IEC has found the best approach for assisting States is to develop an adequate response capability. To this end, the IEC provides States with detailed practical procedures (and associated training) that can be readily adapted for local use. To support States in their training, a *Manual for First Responders to a Radiological Emergency* has been published providing practical guidance for emergency personnel who would respond within the first few hours of a radiological emergency (i.e. fire brigade, police, forensic investigation, local medical team would initially respond at the local level and national officials would support this early response). The guidance is co-sponsored by the International Association of Fire and Rescue Services (CTIF), the Pan American Health Organization (PAHO) and the WHO.

The *Manual for First Responders* guides States in their response to a radiological emergency. The information within—action guides, instructions, practical procedures and tools—can be easily adapted by a State to build a basic capability to respond to a radiological emergency and prepare first responders to appropriately handle such emergencies.

Lessons Learned from Drills

The IEC has conducted several drills to test its capabilities to respond to calls for help and quickly coordinate international assistance. For example, a recent “mock” incident

was staged at a nuclear power plant. The exercise lasted over 40 hours straight and involved over 60 countries and seven international organizations.

Through exercises such as this—and analysis of responses to real-life emergencies—the IEC is able to draw lessons learned. These are lessons which should be kept in mind when developing arrangements for effective first response:

① Clearly allocate tasks and responsibilities

◆ Failure to have a single person clearly assigned to direct the entire response and failure to clearly assign other responsibilities have contributed to an ineffective first response and resulted in avoidable negative health, economic and psychological effects.

◆ National officials have not been effective in directing the first response. Only local officials should direct the first response with support from the national authorities if required.



Radiation experts successfully track down radioactive material during a “dirty bomb” training exercise in Indonesia in 2005.

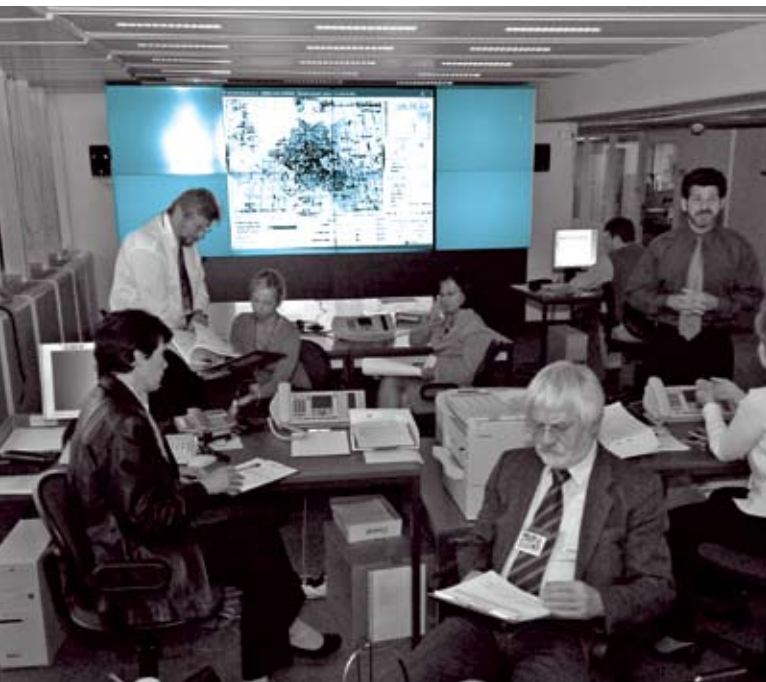
Photo: T. McKenna/IAEA

◆ The arrival of un-requested and unplanned resources and volunteers can interfere with the response.

◆ Only a radiological assessor can fully assess the radiological conditions.

② Keep the public informed

◆ Failure to have a single source of all official information and failure to promptly address public and media concerns in a coordinated, understandable and consistent manner have contributed to major negative



Drills test the IEC's capabilities to respond to calls for help and quickly coordinate international assistance. A recent training scenario was a simulated accident at a nuclear power plant. The mock emergency lasted over 40 hours straight, in an exercise involving over 60 countries and seven international organizations.

Photo: D.Calma/IAEA

economic and psychological consequences. Such failures in public communication have led to the public taking unwarranted actions doing more harm than good.

- ◆ Media interest, including reporters arriving at the scene within hours, should be expected and effectively handled.
- ◆ Uninformed people, acting as experts (e.g. local medical practitioners, school science teachers, etc.), may give wrong or misleading information, resulting in people taking unwarranted actions.
- ◆ Lost or stolen dangerous radioactive items have been safely recovered following public announcements describing the items and associated hazard.

③ Managing the medical response

- ◆ Medical professionals (local doctors) are often the first to discover a radiological emergency when they recognize symptoms indicating the possibility of radiation exposure in their patients.
- ◆ Some medical specialists may be reluctant to treat potentially contaminated victims because of not being properly informed about the risks involved and personal protection to be taken.

- ◆ People who are not exposed, contaminated or injured, but have concerns about their health (“the worried-well”) may go to local hospitals on their own, thus interfering with the ability of the hospitals to treat those who are injured (especially if those injured arrive later).

- ◆ Thousands of people (about 10% of the local population) may ask to be monitored following the media announcement that there has been a radiological emergency in a public place.

④ Manage the law enforcement/ forensic evidence

- ◆ Evacuation points, staging areas, etc. have been identified in the past by terrorists or criminal groups as the ideal location for booby traps or secondary devices.
- ◆ Terrorists or criminal suspects could be among the public and could be a threat to those conducting treatment or monitoring.
- ◆ There is the potential of losing important intelligence and information if all items found and/or recovered from the scene are not treated as evidence. Valuable forensic evidence has been lost or destroyed because responders were unaware that many of their actions (e.g. not tagging and retaining contaminated items or conducting decontamination) can destroy evidence.

⑤ Communicate during an emergency

- ◆ Local telephone systems (including mobile/cell phone systems) have failed during emergencies due to overloading once the public becomes aware of the emergency.
- ◆ Mobile phones may be jammed at the scene for security reasons.

Whether due to an accident or an intentional terrorist act, radiological incidents and emergencies will continue to occur throughout the world. The ability of national first responders to competently deal with such events will have a critical impact on the extent of damage. In the case of a terrorist attack, an effective first response could mean the difference between a small incident with minimal impact and a major catastrophe with significant social and psychological impacts. As such, preparing national first responders will remain a high priority for the IAEA Incident and Emergency Centre.

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Step by Step

The IEC Provides Help for “First Responders”

When an emergency hits, the first people on the scene — called “First Responders” — are local services, including paramedics, police, and fire brigades. They have important roles in the early response to a radiological or other kind of emergency. What they do in the first few hours can save lives.

The IAEA—through its Department of Nuclear Safety and Security—is issuing guidance to front line emergency response teams that would respond in the event of a nuclear or radiological incident.

“Since radiation emergencies are rare, responders generally have no experience handling these kind of events,” says Warren Stern, who heads the IAEA’s Incident and Emergency Centre (IEC). “First responders can benefit a lot from practical guidance about what’s known about radiation and how to deal with accidents and incidents involving nuclear or radioactive materials.”

The IEC’s *Manual for First Responders* covers all the basic concepts and terms needed by first responders and uses language that can be easily translated into national guidelines for use by first responders. The first section targets actions to be taken by the incident commander (IC) and the overall direction of the first response. Subsequent sections contain actions for specific responders and teams that will quickly take action under the direction of the IC.

The Manual also offers instructions on how to perform specific tasks. This information is presented in cards that summarize, in bullet form, the detailed action guides presented in previous sections. These cards are to be used in the field by emergency services personnel during an actual response.

Appendices offer 1) a registry form for persons involved in a radiological emergency; 2) sample media and public statements for different radiological emergencies; 3) a description of emergency preparedness arrangements that need to be in place to use guidance effectively; 4) answers to frequently asked questions in case of a radiological emergency; and 5) a brief description of the basis for the radiological criteria used in this guidance.

The document was developed with the understanding that the responses to radiological and chemical emergencies are similar, albeit characterized by some specific differences. In both radiological and chemical emergencies, the

major goals of the response are the same, namely 1) to protect the public; and 2) to protect emergency personnel during response. In both cases, our senses (e.g. smell or sight) may not be able to detect hazardous levels of the material. Therefore, the initial response is often carried out based on secondary indications of the hazards. These can include labels and signs indicating the presence of hazardous material, the appearance of medical symptoms in exposed individuals or readings from specialized instruments.

However, there are the following differences:

- ◆ Responders generally have no experience with radiation emergencies as they are very rare.
- ◆ Even very low levels of radiation that pose no significant risk can be detected rapidly with simple, commonly available instruments.
- ◆ Radioactive materials can cause radiation exposure even when persons are not in contact with them.
- ◆ The health effects resulting from radiation exposure may not appear for days, weeks or even years (chemicals may also cause delayed effects, such as cancer induction, although the immediate health effects are often the main concern).
- ◆ The public, media and responders often have an exaggerated fear of radiation.

With both chemical and radiological emergencies, first responders at the initial stage of response are the same (typically local officials and emergency services personnel). Furthermore, in general, the basic actions of first responders to radiological emergencies should not differ from those taken in response to emergencies involving other hazardous materials.

For more information on the *Manual for First Responders* visit the IAEA’s website at www.iaea.org

