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IEM 8: Strengthening the Effectiveness of Research and Development to Support EPR

From 16 to 20 February 2015, 150 experts from 35 Member States and five international organizations gathered at IAEA Headquarters for an International Experts Meeting (IEM) on *Strengthening Research and Development Effectiveness in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant*. Organized in cooperation with the OECD/NEA, the meeting was the eighth in a series of IEMs held since 2012 in connection with the implementation of the IAEA Action Plan on Nuclear Safety.

The main objective of IEM 8 was to provide a forum for the exchange of information and experience on research and development (R&D) work undertaken in light of the Fukushima Daiichi accident, with a view to assisting Member States in the planning and implementation of R&D activities. The meeting consisted of an opening session and six technical sessions, with Session 4 dedicated to discussing the role of R&D in enhancing the capabilities of emergency preparedness and response (EPR) to contribute effectively to the decision making process during an emergency.

Session 4 of IEM 8 was dedicated to discussing R&D in Emergency Preparedness and Response (Photo Credit: P. Kenny/IAEA-IEC)

The session on EPR identified a number of key points with regard to the need for assessment and prognosis during nuclear emergencies. The capabilities of Member States to perform these activities were seen as essential, and emphasis was placed on their possible utilization through the IAEA Response and Assistance Network (RANET).

Another key point that was highlighted during the presentations was the need for R&D in helping to improve some of the tools and methodologies used in the assessment and prognosis process. In addition, attention was called to the need for Member States and operators to be prepared to exchange dynamic data during an emergency.

The presentations included discussions of R&D activities, including those already conducted and those still ongoing,

in the area of Atmospheric Transport and Dispersion Modelling (ATDM), with the view to further enhancing these models to take into account the effects of precipitation and dry deposition. The need to focus modelling on those radionuclides that are dominant in respect to public health (e.g. ^{131}I) was highlighted. The application of R&D in the areas of source term reconstruction and inverse modelling was also emphasized.

There have been ongoing R&D activities in the application of monitoring technologies to provide harmonized data during and following an accident. Recent progress was reported on the development of spectroscopic detector systems. Nuclide specific data, especially in the vicinity of a nuclear power plant, combined with the results of ATDM, will contribute significantly to the improvement of the source term reconstruction.

This information, combined with plant specific data, will greatly facilitate the assessment and prognosis of an accident and, in turn, contribute to the decision making process and the implementation of protective actions.

Different research activities are currently ongoing, and their coordination at the international level could optimize the efforts and harmonize outputs, along with the application of the research results.

At the meeting, it was acknowledged that RANET has an important role to play in supporting the international assistance to Accident States and affected States. The harmonization of measurement techniques, strategies and data exchange will help to further enhance the international response and assistance mechanisms.

As with previous IEMs, the IAEA has made the presentations given at IEM 8 available on its public web site and will publish a report summarizing the key points, conclusions and recommendations of the meeting.

More information on IEM 8 is available at: http://www-ub.iaea.org/iaeameetings/48908/International-Experts-Meeting-on-Strengthening-Research-and-Development-Effectiveness-in-the-Light-of-the-Accident-at-the-Fukushima-Daiichi-Nuclear-Power-Plant.

Internal IAEA Full Response Exercise

The IAEA's Incident and Emergency Centre (IEC) conducts regular exercises to ensure that its response to a possible emergency at a nuclear installation or other radiological emergency is effective and commensurate with the nature and magnitude of the event.

Upon invitation, the IAEA Secretariat participates in emergency exercises hosted by Member States. However, the IAEA also regularly conducts its own internal Full Response Exercises.

On 25 March 2015, more than 50 staff members from all over the IAEA participated in such an internal Full Response Exercise in the IEC. The exercise involved a simulated emergency at a nuclear power plant in Europe that caused a release of radioactivity into the environment, with potential effects that crossed national borders. Since this exercise did not involve any external agency or organization, a number of IEC staff members served as a 'simulation cell', providing details of the simulated emergency on behalf of the Accident State, other States and international organizations to their IAEA counterparts. For this exercise, the staff successfully utilized a new information management system; completed an assessment and prognosis of the presumed accident conditions; and effectively shared event information with national counterparts.

IAEA staff during the internal Full Response Exercise, 23 March 2015 (Photo Credit: W. Gruenwald/IAEA-IEC)

The IEC uses these exercises to make sure of the operation of its tools and resources for emergency response. They also represent valuable opportunities for IAEA staff members to maintain their training and qualification in the Centre. In this way, Full Response Exercises demonstrate how the IEC stands ready to perform its mission as the IAEA's focal point for response to any nuclear or radiological incident or emergency.

Board of Governors establishes Safety Requirements in EPR as an IAEA Safety Standard

The Board of Governors, at its meeting on 3 March 2015, established the draft text in English of the revised Safety Requirements on Preparedness and Response for a Nuclear or Radiological Emergency as an IAE safety standard. The Board also authorized the Director General to promulgate these Safety Requirements and to issue them as a General Safety Requirements publication (No. GSR Part 7) in the IAEA Safety Standards Series.

The Safety Requirements No. GSR Part 7 are expected to be published by the end of 2015. They will be jointly sponsored by thirteen international intergovernmental organizations. In addition to the IAEA, they include: the Food and Agriculture Organization of the United Nations (FAO), the International Civil Aviation Organization (ICAO), the International Labour Organization (ILO), the International Maritime Organization (IMO), INTERPOL, the OECD Nuclear Energy Agency (OECD/NEA), the Pan American Health Organization (PAHO), the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), the United Nations Environment Programme (UNEP), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the World Health Organization (WHO) and the World Meteorological Organization (WMO).

ConvEx-2a

The effective communication, in a timely manner, of emergency related information is essential to ensure that States can easily understand the nature of an event, so as to determine the appropriate actions they need to take and to ensure that consistent advice is provided to the public. The communication of emergency information in accordance with the Convention on Early Notification of a Nuclear Accident and the Operations Manual for Incident and Emergency Communication (EPR-IEComm 2012) is intended to help meet the relevant requirements and expectations of the international community.

To support this endeavour, a ConvEx-2a exercise was conducted on 18 March 2015. The main objective of this exercise was to test the ability of National Competent Authorities (NCAs) to complete the appropriate reporting forms to communicate incident and emergency information to the IEC and IAEA Member States, as described in EPR-IEComm 2012. The exercise also tested the effectiveness of the communication channels between the IEC and the participating NCAs.

In 2015, more than 40 Member States took part in the exercise, which was a significant increase from 32 participants in 2014. During the exercise, the IEC provided the participating NCAs with inputs related to scenarios that involved two different emergencies (one nuclear and one radiological). The NCAs used the information supplied to report the emergencies to the IEC, using the exercise website of the Unified System of Information Exchange in Incidents and Emergencies (USIE) and the primary fax channels. The scenarios also involved requests for assistance designed to provide the NCAs with the opportunity to become more familiar with the process of requesting international assistance.

The IEC will perform an evaluation of the exercise and make the report available on the USIE website.

EURDEP Meeting

The cooperation between the IAEA and the EC in the development of the International Radiation Monitoring Information System (IRMIS) was acknowledged at the meeting of the European Radiological Data Exchange Platform (EURDEP), which took place in Varese, Italy, from 9 to 13 March 2015. The meeting focused on the progress of European and international collaboration in the area of radioactivity data monitoring and sharing. Special attention was given to the two major EURDEP developments that had taken place after the Fukushima Daiichi accident in March 2011: the further expansion of data exchange about airborne concentration and the enhancement of the communication of data to the general public. The delegate from the IEC reported on the IAEA's role in EPR and briefed the meeting participants on the status of the IRMIS project.

The IAEA development of IRMIS and the implementation of the International Radiological Information Exchange (IRIX) communication standard continue to be supported by the EURDEP project group through the provision of technical assistance for the collection of monitoring data from Member States participating in the testing phase of IRMIS. The EURDEP project groups are also developing and making available various data converters that support the sharing of data in routine and emergency situations.

The use of the IRIX communication standard (and the associated web services) in both the IAEA (USIE, IRMIS)

and the EC (ECURIE[1], EURDEP) was recognized as a viable approach for future developments of communication and data sharing in nuclear or radiological emergencies.

Train the Trainers Workshop on Medical Aspects of EPR

Twenty-one medical experts gathered in Vienna, Austria, from 16 to 20 March to attend the Inter-regional Training Workshop on Medical Response to Radiation Emergencies.

The event was organized by the IAEA jointly with the U.S. Department of Energy's Oak Ridge Institute for Science and Education (ORISE) and its Radiation Emergency Assistance Centre/Training Site (REAC/TS). During the five-day training workshop, the participants attended lectures and took part in practical activities aimed at strengthening EPR medical capabilities in participating countries.

The final session of the training workshop, 20 March 2015 (Photo Credit: Alessandra Scalia/IAEA-IEC)

IEC Staff News

The IEC welcomes Adriana Baciu (Romania) and Rosina Kerswell (UK) as Consultants, and Prudence Willats (UK), Alessandra Scalia (Italy) and Uranchimeg Tsegmed (Mongolia) as Interns.

[1] European Community Urgent Radiological Information Exchange

A practical session of the workshop at the Vienna International Centre's medical facilities (Photo Credit: Alessandra Scalia/IAEA-IEC)

EPR-Medical 2005 Review Process

The review process of the publication EPR-Medical 2005: *Generic Procedures for Medical Response during a Nuclear or Radiological Emergency* is being implemented by the IEC in cooperation with experts from several Member States and international organizations.

The initial stage of the review process consisted of the distribution of a survey to medical experts from universities, hospitals and medical associations worldwide. Members from RANET, experts from the WHO's Radiation Emergency Medical Preparedness and Assistance Network (WHO/REMPAN) and the International Federation of the Red Cross took part in the process.

The first Consultancy Meeting, aimed at analysing the results of the survey and working on updating the publication, was held in Vienna from 11 to 13 March. In the next months, participants in the review process will be updating and modifying the structure of the reviewed document.

EPRIMS

As announced in 2014 in several forums — such as the Seventh Meeting of the Member States' Competent Authorities, the Technical Meeting on Lessons Learned from Past Emergency Preparedness Review (EPREV) Missions and the meetings of the Emergency Preparedness and Response Expert Group (EPREG) — in 2015, the IEC

will launch its new Emergency Preparedness and Response Information Management System (EPRIMS).

EPRIMS is an interactive, web-based tool for Member States to share at the preparedness stage information on their preparedness and response capabilities for nuclear and radiological emergencies. It offers a number of innovative features as compared to previous systems used to share information on EPR in non-emergency situation.

First, EPRIMS allows multi-user entry of data, with dialogue capabilities to ensure a broad involvement of EPR professionals in each Member State in the assessment of its own EPR capabilities. Second, it offers a higher assessment resolution by allowing distinct input for different emergency preparedness categories, thereby reflecting differences in EPR arrangements for nuclear power plant and other activities. Third, the system allows each Member State to decide with which other Member State(s) it would like to share its information. And fourth, the system is capable of on-line analysis of the data to provide an overview by country, sub-region, region or inter-regionally. Most importantly, EPRIMS can be used by each Member State to conduct its own EPR self-assessment.

In addition to knowledge sharing of EPR capabilities, EPRIMS will also contain a knowledge management database of static nuclear reactor technical information (RTI). During preparedness activities, Member States will be able to provide technical information regarding their nuclear power reactors, including technical schematics and figures.

EPRIMS is also linked to the IAEA Power Reactor Information System (PRIS) database to avoid the need for Member States to enter the same information is two systems.

Member State Preparedness

To assist Member States with applying IAEA guidance in the area of EPR, nine training events at inter-regional and national levels, as well as four expert missions at national level, were conducted during the first quarter of 2015.

Inter-Regional Level:

- Train the Trainers Workshop on Medical Aspects of Emergency Preparedness and Response (Austria, Vienna, 16–20 March)

National Level:

- National Workshop on Notification, Reporting and Requesting Assistance to the IAEA (Oman, Muscat, 2–4 February)
- National Training Course on Emergency Preparedness and Response (Emergency Medical Response - At the Hospital) (Sri Lanka, Colombo, 5–7 February)
- National Training Course on Emergency Preparedness and Response for First Responders (Sudan, Khartoum, 15–26 February)
- National Training Course on First Response to Radiological Emergencies (Thailand, Rayong Province, 9–13 March)
- National Training Course for First Responders in Radiation Emergencies (Honduras, Tegucigalpa, 23–27 March)

The IEC participated in the lecture on Safety Standards in EPR at the Training Course on IAEA Safety Standards organized by Tokai University (Japan, Tokyo, 21–27 February). In addition, the IEC implemented EPREV missions in Ghana (13–14 January), Kenya (1–10 March) and the United Arab Emirates (21–31 March), and participated in the Integrated Regulatory Review Service (IRRS) mission to India (15–27 March).

The IEC participated in missions and events related to EPR, including: an expert mission for the development of the National Emergency Preparedness and Response Plan–Version 0.2 for Oman (Muscat, 25–29 January); an expert mission to support the setting up of a Radiation Monitoring System in the Philippines (Quezon City, 2–6 February); an expert mission for the evaluation of potential reference hospitals in Sri Lanka on medical response to radiological emergencies (Colombo, 3–4 February); and an LEU expert mission to review EPR arrangements for conventional hazards at the Ulba fuel processing facility (Kazakhstan, 16–20 February).

The IEC also attended the tenth meeting of the Working Group on emergencies (WGE) of the Heads of European Radiological protection Competent Authorities (HERCA) (Switzerland, Brugg, 21–23 January); the workshop on Effective Inter-Agency Interoperability and Coordinated Communication in Case of Chemical and/or Biological Attacks, hosted by the Organisation for the Prohibition of Chemical Weapons (The Netherlands, The Hague, 19–20 February); and the Workshop on Decision Making for Implementation and Termination of Protective Measures in Case of a Nuclear Accident (Pakistan, Islamabad, 16–20 March).

Participants of the EPREV Mission to Kenya (Photo Credit: M. Breitinger/IAEA-IEC)

Upcoming Activities

Information about upcoming training events for Member State Emergency Preparedness is available at: http://www-ns.iaea.org/training/calendar.asp?rg=&aoe=er&yr=2015&lg=&s=9&l=73&submit.x=16&submit.y=14.

EPREV Mission to Kenya

In March 2015, the IEC conducted an Emergency Preparedness Review (EPREV) mission to Kenya. The mission included 12 site visits and five interviews with stakeholders in Nairobi and Mombasa over a ten-day period. The review was conducted based on General Safety Requirement (GSR) Part 7, Preparedness and Response for a Nuclear or Radiological Emergency, which was approved by the IAEA Board of Governors while the mission was underway. This was the first peer review mission to use GSR Part 7 as the basis for the findings, including its recommendations, suggestions and good practices. The review team, consisting of experts from Croatia, The Netherlands, Slovenia, South Africa and the IEC, noted many benefits resulting from the new document, especially the increased consistency of terminology and the clarity of the requirements. The EPREV Report is now being reviewed and finalized before it will be published.

RENEB Meeting

From 4 to 6 March, the fourth annual RENEB (Realizing the European Network on Biological Dosimetry) meeting took place at the ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) Headquaters in Rome, Italy. Seventy-four participants from 30 European and international organizations discussed the progress of the RENEB network. The focus was on the recent activities of the network performed in 2014, such as the performance of an intercomparison with different biological and biophysical assays, comprising up to 43 laboratories worldwide for a single technique.

At the meeting, the establishment of a quality assurance programme for the identification and integration of new techniques and new partners and different training activities was presented. To effectively contribute to emergency preparedness systems, strong links to national and international radiation emergency and preparedness organizations have been established. To this end, the IAEA and WHO are represented on the RENEB Advisory Board.

During the open session of the meeting, Mr. Eduardo Herrera Reyes gave a presentation on the role of the IEC in radiation emergencies and the latest accidents in Latin America. Further presentations were given by Ms. Zhanat Carr (WHO), Ms. Maria Antonia Lopez Ponte (CIEMAT[2], Spain, on behalf of the European Radiation Dosimetry Group) and Ms. Ulrike Kulka (Bundesamt für Strahlenschutz, Germany, on behalf of RENEB).

The RENEB project, which is funded by the European Union through EURATOM, aims at establishing a sustainable European network of biological and retrospective dosimetry. It was first launched on 1 January 2012, and is planned to be carried out until the end of 2015. The project is coordinated by the Bundesamt für Strahlenschutz, the German Radiation Protection Authority.

Update by Finland of its RANET Registration

The Finnish Radiation and Nuclear Safety Authority (STUK) updated its registration in the IAEA Response and Assistance Network (RANET) on 18 March 2015. It registered 14 new National Assistance Capabilities (NACs) in five RANET Functional Areas and removed one previously registered NAC. The updated registration of NACs helps to provide a greater depth to the number and quality of capabilities registered in RANET.

All States registered in RANET need to continually review their NACs to determine if new capabilities may be registered in RANET or to remove any that may no longer be available. States Parties to the Assistance Convention who have not yet registered in RANET are encouraged to register any NACs that are deemed suitable for providing international assistance.

[2] Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

Recent Events

In the first quarter of 2015, six INES Level 2 events were communicated by France, the United States of America and Poland on USIE/NEWS. Poland also communicated an INES Level 1 event involving the theft of 22 containers with Category 4 and 5 ^{60}Co sources. For the INES Level 1 event communicated by Poland, the IEC provided its counterpart in WHO with the plain language descriptions of the low level of risk associated with Category 4 and 5 sources, as provided in Appendix II of Safety Guide RS-G-1.9, Categorization of Radioactive Sources (http://www.pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf).

Two events involving moisture/density gauges were communicated by the counterparts in Kenya and Mauritius. A Standard Report Form (SRF) was used for this purpose by the counterpart in Kenya, while an Event Notice Form (ENF) was used by Mauritius. Although for the specific information shared by Mauritius, the use of the ENF form was considered adequate, the recent ConvEx-2a exercise has revealed that some counterparts are inclined to use ENFs in situations where SRFs should be used.

Counterparts are encouraged to choose the communication forms according to Attachment 1 of the Operations Manual for Incident and Emergency Communication, available on USIE.

Upgraded IEC videoconferencing infrastructure

The IEC has recently upgraded its videoconference infrastructure by implementing a dedicated video domain, which is especially secured by firewall rules and which allows direct incoming videoconferencing traffic. Thanks to this upgrade, any external videoconferencing system can reach all of the IEC's systems with H323, E.164, SIP and H320 protocols.

The Centre is also currently able to provide several virtual meeting rooms that can host various video and audio participants.

The IEC encourages all contact points to make their video conferencing details, including information about mobile video conference applications, available in the USIE address book.

EPREG Meeting

The fourth meeting of the IAEA Emergency Preparedness and Response Expert Group (EPREG) took place in Vienna, Austria, from 15 to 17 December 2014 at the invitation of the Deputy Director General Denis Flory, Head of the Department of Nuclear Safety and Security.

Representatives from ten EPREG members attended the meeting. The meeting's objective was the discussion of issues and challenges in emergency preparedness and response. In particular, the meeting focused on: (1) the process for the assessment of potential radiological consequences in a nuclear emergency and the possible progress of the event; (2) next steps to be taken concerning the safety and security interface in EPR; (3) emergency preparedness and response in transportation emergencies involving radioactive (nuclear) material; (4) communication with the public in an emergency; and (5) quality management in emergency preparedness and response.

Based on the discussions, EPREG recommended preparing a fact sheet on the assessment and prognosis process in case of an emergency at a nuclear power plant to address objectives, scope and limitations; information required; capabilities of the IAEA Secretariat; capabilities of Member States to assist; and examples of how the process would work. The information sheet would have to be distributed to all competent authorities. EPREG also recommended the establishment of a new committee under the Commission of Safety Standards.

The fifth meeting of EPREG is scheduled to be held from 17 to 18 June 2015.

International Conference on Global Emergency Preparedness and Response

The IAEA has continuously supported the work of its Member States in Emergency Preparedness and Response (EPR), in particular since the accident at the Chernobyl nuclear power plant (NPP) in 1986. The accident at the Fukushima Daiichi NPP in 2011 again emphasized the need to strengthen emergency preparedness and response at the national as well as at the international levels.

From 19 to 23 October 2015, the IAEA's Headquarters in Vienna will host the International Conference on Global Emergency Preparedness and Response.

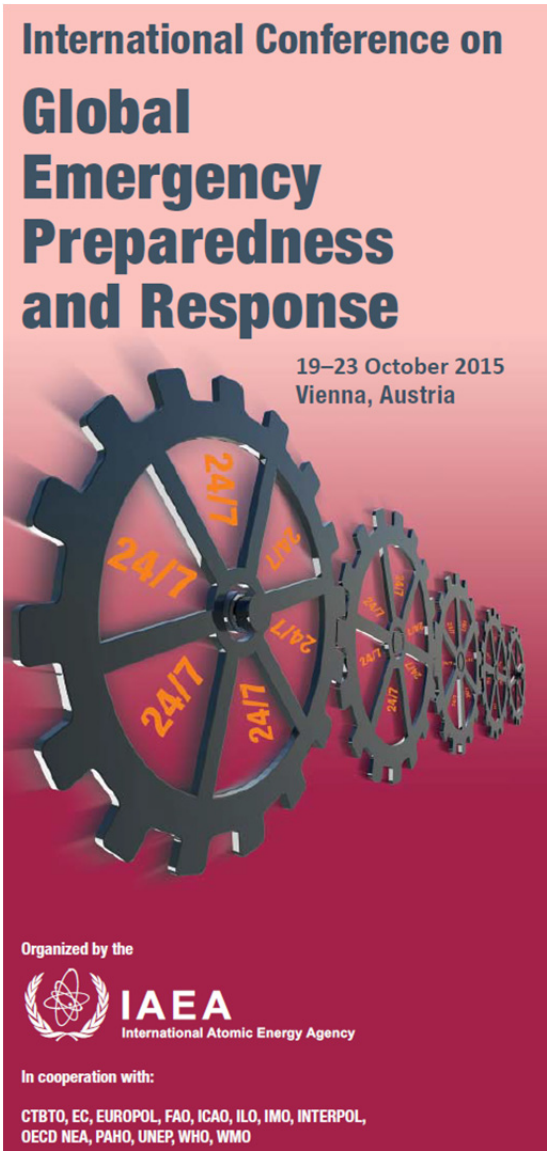
Organized by the IAEA in cooperation with numerous international agencies and organizations, the EPR conference will bring together emergency responders as well as relevant stakeholders in order to achieve the following:

- Present contemporary EPR solutions;
- Exchange information on national EPR arrangements and capabilities;
- Share strategies, experiences and good practices in EPR; and
- Discuss challenges and priorities in further strengthening readiness to respond to any nuclear or radiological incident or emergency.

The topics covered will include: emergency management, protection strategies, communications, public health and medical response, waste, international cooperation, education and training and past experiences.

The conference is targeted at governmental officials with responsibilities in EPR, experts in EPR as well as in nuclear security matters, representatives of response and operating organizations, emergency responders, public information officers and others involved in EPR for nuclear and radiological incidents and emergencies.

More information is available at:
http://www-pub.iaea.org/iaeameetings/45986/International-Conference-on-Global-Emergency-Preparedness-and-Response



Impressum

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