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Contents

Prepared To Respond International Conference on Global EPR

As Yukiya Amano, Director General of the IAEA, pointed out in his opening remarks, the International Conference on Global Emergency Preparedness and Response, which took place in Vienna from 19 to 23 October, was "the largest international gathering of experts in emergency preparedness and response" ever held by the IAEA. Organized by the IAEA in cooperation with 13 international agencies (CTBTO, EC, Europol, FAO, ICAO, ILO, IMO, INTERPOL, OECD NEA, PAHO, UNEP, WHO, WMO), the conference attracted more than 420 participants from 82 Member States and 18 international organizations, providing a unique forum to exchange information in EPR, share strategies and experiences and discuss challenges and priorities in preparedness for and response to nuclear and radiological emergencies.

His recently issued report of the Fukushima Daiichi accident, Mr Amano added, has shown that "weaknesses in emergency preparedness and response, and in planning for the management of a severe accident," were among the important factors that contributed to the complex chain of events during the accident. He emphasized that, since the possibility of a radiation related emergency cannot be excluded, "it makes an efficient emergency preparedness and response system essential".

Participants at the opening session of the Global EPR conference (Photo: D. Calma/IAEA).

Juan Carlos Lentijo, IAEA Deputy Director General and Head of the Department of Nuclear Safety and Security, stated that, while creating and maintaining emergency preparedness and response systems are a national responsibility, active cooperation among countries is also required. "We all know that emergencies do not respect borders," Mr Lentijo stressed, "hence international efforts in building efficient emergency preparedness and response are needed."

Elena Buglova, Head of the IEC, highlighted the role played by the IAEA, and especially the IEC, in helping Member States to improve their emergency and response capabilities and in acting as the global focal point for 24/7 coordination of international communication, assistance and response. She

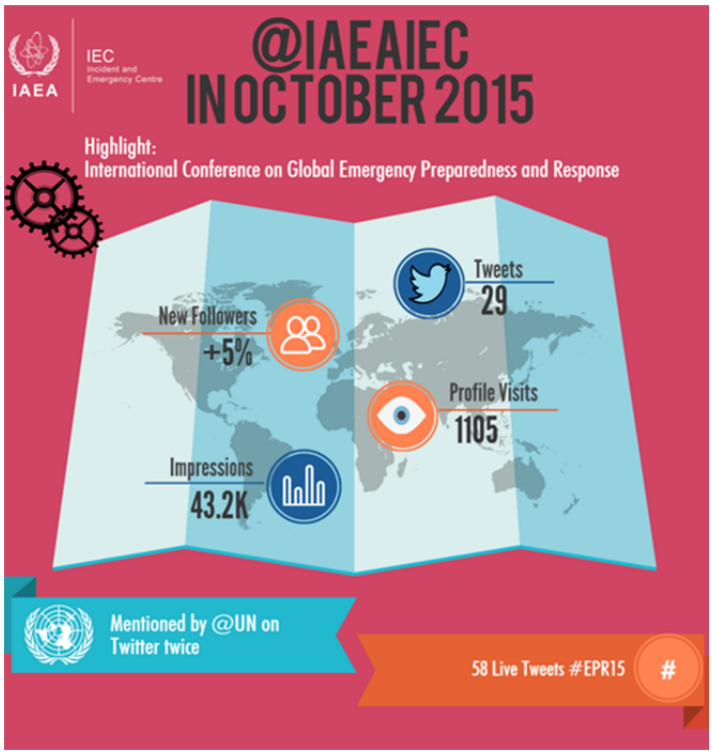
also drew attention to the fact that acting quickly and responding properly to an emergency requires extensive preparation: "Emergency response," Ms Buglova pointed out, "begins with preparedness."

In his opening statement, the conference president, Ramzi Jammal, Executive Vice-President and Chief Regulatory Operations Officer of the Canadian Nuclear Safety Commission, commented on the "very high level of interest and participation" in the conference, which was "a testament to the commitment of the international community to global emergency preparedness and response". He outlined the main topics of the conference, covered in its seven major sessions: international cooperation; communications in an emergency; emergency management; past emergencies; protection strategy; education and training; and public health and medical response.

Among the key issues to be addressed at the conference, Mr Jammal mentioned the need for emergency planning at multi-unit plants; clarity on the roles and responsibilities of regulators and all levels of government; unambiguous criteria on the protection of the public and emergency workers, based on factual information relating to the risks of radiation exposure and its attribution to health effects; and close communication with the public and all relevant stakeholders not only during an emergency but well before its occurrence in order to build up and maintain trust and credibility. Mr Jammal also commented on the ongoing debate concerning the need to integrate safety and security measures in emergency response. "When it comes to any emergency," he pointed out, "the objectives of the response are to protect human life and health and the environment. These objectives are what safety and security measures have in common, hence the need for continuous discussion about their integration during an emergency."

In total, 152 presentations were given on a variety of aspects of the seven major conference topics. Of these, 52 were oral presentations and 81 were provided in the form of poster presentations. Seven senior experts were asked to deliver keynote addresses, and there were another 12 invited speakers. In addition to the topical sessions, the conference featured three round-table discussions, which explored key issues in specific EPR areas: nuclear security/safety integration in an emergency; risk communication and what is 'safe'; and EPR — the way forward and priorities.

Four refresher workshops were held to provide participants with the opportunity to update their knowledge in the following areas: protection strategy for a nuclear or radiological emergency; communication in an emergency; public communication; and medical management in a nuclear/radiological emergency. In addition, six visits to the Incident and Emergency Centre were organized, and about 120 conference participants availed themselves of the opportunity to listen to presentations from IEC staff and discuss with them the role of emergency response centres.



Infographic: IAEAIEC Twitter performance in October 2015.

At the closing of the conference, Mr Jammal summarized its major achievements in six recommendations:

- The need to define what is 'safe', in clear and plain language and based on scientific evidence and reasoning, in order to be able to respond to simple questions from the public about radiation safety. The IAEA should develop, in consultation with other international organizations, a framework (including dose limits) that would help eliminate the current confusion among the public and help to uphold and re-inforce the credibility of experts and the trustworthiness of authorities and organizations responsible for protecting the public.
- The need to develop methods for communicating risks to the public during the preparation phase as well as following a nuclear or radiological emergency. The IAEA, through the new Emergency Preparedness and Response Standards Committee (EPReSC), should develop communication material for use by decision makers, relevant authorities and organizations to provide scientifically based information in simple and clear language to the public on issues relating to a nuclear or radiological emergency. The use of a single reference document would ensure that consistent and credible information was being communicated worldwide.
- The need to review and, if appropriate, address the observations and lessons arising from the assessment of emergency preparedness and response in the

IAEA Director General's report on the Fukushima Daiichi accident.

- The need to further promote the effective integration of safety and security aspects in EPR. The IAEA should continue to implement activities advancing this objective, and Member States should take steps to harmonizing emergency arrangements and regulatory reviews in order to identify and resolve potential conflicts. The establishment of a unified command system — on-site and off-site — and the conduct of joint exercises would help to better coordinate safety and security aspects of the response.
- The need for a holistic approach in implementing a protection strategy. The current lack of guidance for the termination of a nuclear or radiological emergency and the transitioning to recovery, including remediation, should be remedied, and the IAEA should continue to address this issue.
- The need for harmonization of protection strategies and communication among countries, particularly neighbouring countries. International cooperation is fundamental in achieving harmonized EPR arrangements and in building capacity in Member States. Arrangements for improving consultations and the sharing of information among Member States on protective actions need to be strengthened through the framework of the IAEA relating to EPR, and broad compliance with the international safety standards in EPR is a key step in achieving harmonization. In addition, Member States should educate and train their emergency planners and responders, using material available in international safety standards, and perform exercises, including those at the regional and international levels.

Mr Jammal emphasized that is incumbent upon regulators and operators, as well as national and international organizations, to implement these "reasonable and achievable" recommendations. In view of the value of the present conference, he recommended that the IAEA organize another conference on EPR that would allow Member States to report on their implementation of the recommendations.

"Enhancing nuclear safety," he concluded, "is an ongoing process." While nuclear safety has been strengthened since the Fukushima Daiichi accident, "much remains to be done."

Launch of EPRIMS

At the 59th General Conference of the IAEA in September 2015, the IEC organized a side event to launch its Emergency Preparedness and Response Information Management System (EPRIMS). EPRIMS allows all Member States to collect and share information about EPR arrangements and capabilities. It also provides information required by the IAEA for its expanded role in the assessment and prognosis during nuclear and radiological emergencies.

EPRIMS is an interactive, web-based tool that offers a number of innovative features: First, it allows multi-user entry of data, with dialogue capabilities within each country, thus enabling the appropriate experts in the country to be directly involved. Second, it makes it possible to provide distinct input for different emergency preparedness categories, thereby reflecting differences in EPR arrangements for NPP and other activities. Third, it allows each Member State to decide with which other Member States to share its information. Fourth, it is capable of on-line analysis of the data 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.

Launch of EPRIMS during a side event at the 59th IAEA General Conference (Photo: V. Fournier/IAEA).

Delegates to the General Conference who attended the EPRIMS launch agreed that the systems seemed to provide an excellent way to share information and to assess their countries' own capabilities. Moreover, those experts who had been able to work with a prototype of the system found it a very user friendly and intuitive tool.

In addition to allowing knowledge sharing on 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.

For enquiries or to obtain access to EPRIMS, please contact: EPRIMS.Contact-Point@iaea.org.

First meeting of EPR Standards Committee

The first meeting of the new Emergency Preparedness and Response Standards Committee (EPReSC), under the IAEA's Commission on Safety Standards (CSS), was held in Vienna from 30 November to 2 December. The committee will make recommendations on the EPR aspects of the IAEA's programme for the development, review and revision of safety standards and on the activities to support the use and application of these standards. EPReSC, established in June 2015, brings the total number of IAEA Safety Standards Committees to five.

"The creation of the EPReSC reflects the importance that we give to the cross cutting nature of emergency preparedness and response," said Mr Juan Carlos Lentijo, Deputy Director General, Head of the Department of Nuclear Safety and Security of the IAEA. Members of EPReSC are senior experts in the area of nuclear or radiological emergency preparedness and response. They formally represent IAEA Member States as well as international organizations who maintain an interest in EPR. With the establishment of EPReSC, the effective integration of emergency preparedness and response consideration in IAEA safety standards and nuclear security guidance documents has been significantly enhanced.

Fifty-six Member States and 11 international organizations have nominated a total of over 105 representatives, including attending members, alternates and observers. "This is a clear reflection of the importance that the Member States afford to emergency preparedness and response," Lentijo pointed out.

At its first meeting, EPReSC members reviewed the processes for developing and approving IAEA safety standards, discussed the on-going work within other safety standards committees and adopted a strategic work plan for the work ahead. As Ms Ann Heinrich from the USA, the chairperson of EPReSC, emphasized in her introductory remarks to the committee members: "The fact that this standards committee is newly created is a culmination of a significant effort from many of you. It represents an investment of time, discussions, thought and effort by leaders in emergency preparedness and response, experts in other areas that contribute to nuclear safety and security, and by the IAEA who all wanted to ensure that this subject area is addressed thoroughly and consistently across all safety standards."

The preparation and review of the safety standards involves the IAEA Secretariat and five safety standards committees, for emergency preparedness and response (EPReSC) (as of 2016), nuclear safety (NUSSC), radiation safety (RASSC), the safety of radioactive waste (WASSC) and the safe transport of radioactive material (TRANSSC). The CSS oversees the IAEA safety standards programme.

IEC and French experts test assessment and prognosis arrangements

As approved by the Member States in the IAEA Action Plan on Nuclear Safety, the response role of the IAEA during a nuclear or radiological emergency has been expanded to include an assessment and prognosis function. A prerequisite to assessing the severity of a radiation emergency and to developing a prognosis on how it might develop is the availability of data. Together with representatives from the French Institut de Radioprotection et de Sûreté Nucléaire (IRSN) and the Autorité de Sûreté Nucléaire (ASN), with observers from the Permanent Mission of France to the United Nations and International Organizations, the IEC conducted an exercise to test the exchange of such data on November 17.

French experts and IEC staff test assessment and prognosis arrangements (Photo: IAEA-IEC).

"We are very grateful that our French counterparts gave us the opportunity to test the assessment and prognosis arrangements and to practice the exchange of information to fulfil our mission," said Elena Buglova, Head of the Incident and Emergency Centre. Sylvie Supervil, Head of the Emergency Response Division at IRSN, emphasized the significance of joint exercises. "Both the French competent authority and the French technical support organization," she pointed out, "acknowledge the importance of supporting the Incident and Emergency Centre in the development of the assessment and prognosis process."

During the exercise, the participants simulated a general emergency at the Chinon nuclear power plant following a loss of coolant accident (LOCA). With the data provided by the IRSN, the IEC response team was able to confirm that the emergency classification and the measures taken were in line with international safety standards and guidelines. The participants agreed that, although the exercise lasted for just a few hours, its comprehensive and detailed technical nature made it both challenging and instructive. Aside from gathering and analysing data to develop a substantiated assessment and prognosis, the adequacy and the timely provision of information and various aspects of public communications were part of the exercise.

"The involvement of France's technical support organization and its competent authority, as well as the detailed scenario they developed, provided a valuable opportunity to test procedures and cooperation," concluded Ms Buglova. "It makes exercises like this a win-win situation for all participants and an example for Member States on how the assessment and prognosis process can be supported."

IEC and Swiss counterparts conduct an assessment and prognosis drill

Following the offer of Switzerland to test the mechanism of assessment and prognosis, the IEC continued its series of ConvEx-2e exercises, which are dedicated to the implementation of the assessment and prognosis function assigned to the IAEA in the Action Plan on Nuclear Safety. The IEC sought to further test the assessment tools developed for this purpose, while its Swiss counterparts, the National Emergency Operations Centre (NEOC) and the Swiss Federal Nuclear Safety Inspectorate (ENSI), intended to examine specific aspects of their response arrangements and their capability to provide concise technical dynamic information supporting the assessment and prognosis process for the early phase of a nuclear power plant accident. The exercise, which was based on an accident scenario at the Gösgen NPP, took place on 15 September and involved staff from the technical teams of the IAEA, NEOC and ENSI.

The exercise had been well prepared in advance through numerous discussions held with NEOC experts and through the visit of an IAEA staff member to ENSI for an extensive brief on the IAEA approach to the assessment and prognosis process. Due to this preparation and the clear response procedures that existed at the level of all organizations involved, the exercise proved that a timely exchange of technical information can be achieved in the early phase of an NPP accident. The technical dialogue carried out between the IAEA and ENSI teams gave the IAEA access to the relevant data regarding the status of the nuclear facility, which constitute the basis for the IAEA's assessment and prognosis.

The most important findings of the exercise involved the need for the IAEA to continue to develop and share with Member States its assessment tools, while the Swiss counterparts need to further refine their internal arrangements and roles for assessment and prognosis at the level of partner organizations involved in the response.

Consultancy on the development of CANDU-specific EALs

The IEC held a consultancy meeting to develop emergency action levels (EALs) for CANada Deuterium Uranium (CANDU) reactors. This consultancy was part of an emergency preparedness and response enhancement project for Romania, funded by the government of Norway and implemented in cooperation with the IAEA. CANDU accident phenomenology differs significantly from that of pressurized water reactors.

Taking into account these differences is key to ensuring that any emergency response is optimized and justified. The group of 15 experts reviewed the plant parameters that could be used as the basis for determining the emergency classification and thereby trigger response actions. As pointed out by the IEC's Pascal Dumont, this was the first in a series of consultations that are expected to involve all CANDU owner countries and will lead to the publication of practical IAEA guidance on EALs for CANDUs.

Regional workshops

- Notification, Reporting and Requesting Assistance took place for Member States in the Latin America Region, which took place from 6 to 8 July 2015 in Santiago de Chile, hosted by the Chilean Nuclear Energy Commission (CCHEN). The workshop was devoted to enhancing the knowledge of, and the ability to use, the IAEA's arrangements and resources for official communication between Member States and the IAEA during a nuclear or radiological emergency, including arrangements for international notification and requests for assistance. Ten participants from seven Latin America countries participated in the three day workshop, which offered various topical lectures as well as several practical sessions.

- First Regional Workshop on Medical Preparedness and Response to Radiation Emergencies for Member States in the African Region in Windhoek, Namibia, held from 24 to 28 August. Organized jointly with the IAEA Department of Technical Cooperation and the Government of Namibia, which hosted the event, the workshop focused on the medical response to nuclear or radiological emergencies by providing medical tools and the latest knowledge about the diagnosis, medical management and initial treatment of persons involved in these emergencies. The topics included: radioprotection concepts, radiobiology, acute radiation syndrome, local radiation injuries, medical preparedness at the pre-hospital and hospital levels, as well as treatment and medical follow-up. In addition, case analyses from several accidents in industrial, medical and other fields were discussed. Thirty-three medical doctors from 22 African countries participated in the workshop, which concluded with a visit to the facilities of the Geological Survey of Namibia in Windhoek and the Namibian Uranium Institute and its Hospital in Swakopmund.

Recently reported events

In the third quarter of 2015, six events — most of them involving radiation sources — were communicated by national contact points via the IEC's USIE information exchange website. The two most significant of these events are outlined below.

- On 16 July, Polish authorities reported the loss or theft of an industrial radiography source (IAEA category 2) at a construction site in Zabrze. The event was initially rated at INES level 2. The IEC contacted the competent authority with an offer of the IAEA's good offices. It also pointed out the possibility of Poland requesting assistance through the IAEA Response and Assistance Network (RANET) in source search and recovery and in medical response. On 23 July, the Polish national officer reported that the radiography source had been found and recovered intact, and that no one was suspected to have been exposed to the source. As a result, the event was subsequently downgraded to INES level 1.
- The INES national officer of the United States reported an event on 26 August that involved the exposure to radiation of a technician in an isotope manufacturing facility in Idaho Falls during the transfer of a category 1 ^{60}Co source from a source drawer into a therapy head (shielding container). According to the INES report, preliminary calculations estimated the whole body dose to 169 mSv and the extremity dose to 2.4–9.5 Sv. As a result, the event was rated at INES level 3, which is warranted for the occurrence or likely occurrence of non-lethal deterministic effects. No actions were requested from or initiated by the IEC in this event.

In addition, on 7–8 August, the IEC monitored the passage of cyclone Soudelor in the Asian region and its potential impact on the nuclear power plants in the area. There was no damage to the power plants following the passage of the cyclone.

The IEC also took note of seven national exercises, in which the following countries exercised, among other things, the communication with the IEC and utilized the IEC's USIE exercise website: Brazil, Czech Republic, France, Russian Federation, Switzerland, and United States of America (twice).

Member State preparedness

To assist Member States with applying IAEA guidance in the area of EPR, one inter-regional workshop, two regional training courses and six national training events were conducted during the third quarter of 2015.

Inter-regional level:

- Train the Trainers Workshop on Emergency Preparedness and Response for Major Public Events (USA, Washington DC, 20–24 July)

Regional level:

- Regional Training Course on Medical Preparedness and Response to Radiation Emergencies (Namibia, Windhoek, 24–28 August)
- School of Radiation Emergency Management (pilot version) (Italy, Trieste, 14–25 September)

National level:

- National Training Course on First Response to Radiological Emergencies (Bolivia, Santa Cruz, 13–17 July)
- National Training Course on Medical Response to Radiation Emergencies (Paraguay, Asuncion, 20–24 July)
- National Training Course on Early Warning Environmental Radiation Monitoring (Austria, Vienna, 27–31 July)
- CNCAN 5: Workshop on Extended Response to Radiological Emergencies for Romania (Romania, Bucharest, 27–31 July)
- National Workshop on Strengthening National Capabilities for Response to Radiological Emergencies (Qatar, Doha, 23–27 August)
- National Training Course on Conduct, Implementation and Evaluation of Exercises to Test Preparedness for a

Nuclear or Radiological Emergency (United Arab Emirates, Abu Dhabi, 26 September–1 October)

The IEC delivered lectures on safety standards in EPR at the joint IEC-NSNS training course on Operational Response to a Radiological Emergency Resulting from a Nuclear Security Event, in cooperation with EUROPOL (Poland, Warsaw, 7-11 September). In addition, the IEC conducted an EPREV mission in Jamaica (13–17 July) and participated in an Integrated Regulatory Review Service (IRRS) mission to Indonesia (2–14 August).

The IEC also participated in missions and events related to EPR, including: an expert mission to support the identification of Reference Hospitals for Response to Radiological Emergencies (Paraguay, Asuncion, 13–17 July); an expert mission on Mesenchymal Cell Processing and Quality Control for Patients with Severe Skin Lesions (Peru, Lima, 13–24 July); an expert mission on EPR Fundamentals and Updating the Uganda National Self-Assessment (Uganda, Kampala, 10–14 August); and an expert mission to assist in the conduct of a workshop for stakeholders to discuss, identify and finalize hazard assessment (Qatar, Doha, 6–10 September).

The IEC also attended the annual meeting of the Health Physics Society (USA, Indianapolis, 13–16 July); the Train the Trainers Workshop on Emergency Preparedness and Response for Major Public Events (USA, Washington, 20–24 July); the workshop on NPP Public Protective Actions and OILs (Argentina, Buenos Aires, 24–28 August); the workshop on Regional Cooperation in EPR for ASEAN Countries, organized by the European Commission (Thailand, Chiang Mai, 21–25 September); and the 11th meeting of the Working Group on Emergencies (WGE) of the Heads of European Radiological Protection Competent Authorities (HERCA) (Hungary, Budapest, 24–25 September).

IEC Staff News

The IEC welcomes James Beavers (USA) as Nuclear Power Plant Emergency Preparedness Officer; Sinéad Harvey (Ireland) as IEC Outreach Officer; Sanjoy Mukhopadhyay (USA) as Emergency Response Data Officer; Dewi Apriliani (Indonesia) as a consultant; Mazzammal Hussain (Pakistan) and Marton Keresztes (Hungary) as fellows; and Mariana Mykhailyshyna (Ukraine), Zixi Li (China) and Jelena Vucicevic (Serbia) as interns.

IEC welcomes young visitors on Bring Your Children to Work day

Science for Sustainable Development was the theme for the second annual IAEA 'Bring your Children to Work' day on 26 November. The children of IAEA staff members participated in discussions on how the IAEA is contributing to the achievement of the newly adopted Sustainable Development Goals.

Staff members from the IEC welcomed groups of students into the Centre for an interactive look at its work on emergency preparedness and response. During the visit to the Centre, the children had a practical demonstration of equipment used in missions to the field, including protective gear, offering a taste of some of the work being carried out by the IEC.

Nuclear or radiological emergencies can have serious consequences for the public and the environment, and can hinder the advancements made in achieving sustainable development. Raising awareness with the younger generation of careers in science, technology, engineering and mathematics (STEM) is one aim of this annual day. The IEC staff welcomed the opportunity to demonstrate the role of science in preparing Member States for responding to, and mitigating the consequences of, nuclear or radiological emergencies.

IEC staff demonstrate the use of protective equipment to young visitors at the Centre (Photo: IAEA-IEC).

Impressum

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