

SUMMARY BY THE PRESIDENT

Nestor Masriera

President of the Conference

BACKGROUND TO THE CONFERENCE

The International Conference on Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security, held in Brussels, Belgium, in October 2018, continued the practice established by the three preceding conferences on this subject that were held, respectively, in Beijing in 2014, in Tokyo in 2010, and in Aix-en-Provence in 2007. Like those of earlier conferences, the outcomes of this conference will play a vital part in the national and international efforts made to ensure the effectiveness of nuclear safety and security regulatory systems. These outcomes will focus in particular on ways to strengthen the actions of TSOs in supporting the enhancement of safety and security worldwide.

The Conference brought together 290 registered participants from both TSOs and regulatory bodies from 54 Member States and 5 international organizations. Throughout the event, 62 posters and 47 presentations highlighted specific areas within each of the six topical sessions and stimulated discussions among participants.

OBJECTIVES OF THE CONFERENCE

The Conference highlighted the importance of scientific and technical capabilities to support regulatory decision making for enhanced nuclear and radiation safety and security. While addressing challenges to the development, maintenance and enhancement of such capacities, the discussions focused on the following objectives:

- Evaluate actions undertaken to address the recommendations from previous TSO conferences;
- Promote understanding of the roles, functions and value of TSOs in enhancing nuclear and radiation safety and security and, in particular, addressing challenges related to embarking, existing or expanding nuclear power programmes, with a particular focus on capacity building;
- Discuss the role and achievements of the Technical and Scientific Support Organization Forum (TSO Forum);
- Present the need for, and benefits of, self-assessment for TSOs to maintain and enhance their technical and scientific capabilities to support regulatory bodies' decision-making process;
- Discuss the significant contribution of the TSOs' safety assessment work to the continuous updating and revision of the IAEA Safety Standards;
- Address the role of TSOs in enhancing nuclear and radiation safety in applications other than nuclear power;
- Highlight the main methods for supporting the development of scientific and technical expertise, including research and development;
- Facilitate the exchange of experience and good practices in capacity building activities, and in the recipient countries' arrangements for identifying areas in which they require assistance;
- Discuss ways to enhance international cooperation through IAEA safety and security networks, bilateral cooperation and Nuclear Security Training and Support Centres (NSSCs) or centres of excellence.

OPENING SESSION

The International Conference on the Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security: Ensuring Effective and Sustainable Expertise, highlighted initiatives to develop and strengthen the capability of TSOs. TSOs are independent organizations that provide expertise and services to national regulatory bodies on scientific and technical issues related to nuclear safety and security.

M. Van haesendonck, Director General of Bel V, the Belgian TSO that conducts inspections as well as safety assessments for nuclear projects and host of the conference, outlined the work of his organization, explaining that

its mission is to contribute towards protecting people and the environment against the danger of ionizing radiation on the basis of experience built up over 50 years.

J. Jambon, Deputy Prime Minister and Minister of Security and the Interior of Belgium, highlighted that competent safety authorities — supported by TSOs — are key to safe nuclear activities. He noted that there is a need for experts passionate about nuclear safety, who work every day to make sure that nuclear technology works for the benefit of the people, and that they do not have to worry about accidents.

J.C. Lentijo, IAEA Deputy Director General and Head of the Department of Nuclear Safety and Security, pointed to the diversity of TSOs in his opening remarks, remarking that there is no ‘one size fits all’ for the organizations. He noted that the Conference would discuss the wide range of formats for the organizations and their cooperation with regulatory bodies.

Other speakers at the opening session included N. Masrera, President of the Board of Directors of Argentina’s Nuclear Regulatory Authority, and M. Huebel, Head of the European Commission’s Unit on Radiation Protection and Nuclear Safety.

N. Masrera, as the President of the Conference, gave a welcome to the participants of the fourth TSO Conference, and highlighted the importance of promoting the understanding of the roles, functions and values of TSOs, explaining the framework focused on regulatory bodies. He also described the design of the conference structure and declared the Conference open.

KEYNOTE SPEECHES

Following their opening addresses, there were keynote addresses:

B. De Boeck, Belgium, President of the TSO Conference 2014, presented an update on the implementation of the conclusions and recommendations of the TSO Conference 2014.

G. Caruso, IAEA, Director of the Office of Safety and Security Coordination, presented an overview of IAEA activities related to TSOs.

OVERVIEW OF TOPICAL SESSIONS

Session 1 — Roles of the TSOs supporting regulatory functions

The presenters discussed various examples of roles and models of cooperation between regulatory bodies and TSOs, including the experience, challenges and opportunities relating to the different existing models of cooperation. It is commonly understood that the existence of core capabilities/technical expertise within the regulatory bodies is a precondition for successful cooperation with domestic and international TSOs.

The principal theme concerned the modalities of cooperation between the regulators and TSOs, including international cooperation with respect to the following challenges:

- Newcomer countries and countries with expanding nuclear power programmes are seeking international cooperation to strengthen regulator and domestic TSO capabilities and to access the expertise not (yet) available domestically.
- Countries with established nuclear programmes are trying to optimize TSO effectiveness. In these cases, the motivation for international cooperation may also be access to cost effective, timely or more specialized expertise.
- The establishment and/or selection of TSOs by a regulatory body was highlighted as a challenge, as it has an impact on the preservation and further development of sustainable national expertise.

Recommendation

- The Conference recommended that the IAEA consider continuing a forum for promoting cooperation among TSOs with special emphasis on the needs of embarking countries seeking international cooperation to strengthen regulator and domestic TSO capabilities.
- Member States are encouraged to look for opportunities to increase the dialogue between civil society and technical experts so as to contribute to the trust and confidence in the technical basis supporting regulatory decisions.

Session 2.1 — Safety assessment

Safety assessment is a fundamental element of nuclear regulation, and TSO support to regulatory bodies plays an important role in this area. After an introductory presentation by the IAEA, six presentations by TSOs and regulatory bodies illustrated different elements of this support.

Work is ongoing by the IAEA to facilitate the application of new safety requirements for advanced water-cooled reactor designs and SMRs and to support sharing of experiences on implementing safety improvements at existing nuclear power plants aiming at minimizing radioactive releases in the event of a nuclear accident.

The presentations covered the following aspects of safety assessment:

- Tools aimed at systematic technical review of licensing documents;
- The increasing use of PSA as a supplement to deterministic analyses;
- The role of experiments to better understand physical and chemical phenomena;
- Development and validation of computer codes;
- Tests of high energy arcing fault events with potential of explosion and ensuing fires;
- Independent confirmatory calculations supporting technical reviews.

The presentations and discussions during this session highlighted the importance of increasing awareness on TSO contributions in support of the regulatory bodies.

Session 2.2 — Radiation and waste management safety

This session covered a wide range of topics linked to radiation and waste management safety. The three presentations discussed the role TSOs can have in enhancing safety by developing new ideas and techniques as well as through collaboration. They covered how to formalize the practical elimination of large releases, the development of an expert network on waste management safety and the modernization of a remote monitoring network.

It is important that TSOs be part of the development of IAEA Safety Standards in these fields.

In summary:

- TSOs play an important role in defining guidance on safety principles;
- There is value in wider networks that include TSOs, regulatory bodies and civil society, especially in the area of waste management;
- In some areas, such as radiation monitoring, there is a need to balance the diverse needs of the regulatory body and the public.

Session 2.3 — International cooperation

International cooperation, whether bilateral or within frameworks and networks, is a necessary tool to enhance the expertise and capabilities of TSOs. The approaches and objectives of these cooperation tools complement each other in order to satisfy the targets of the regulatory bodies and their TSOs.

In this session, the European Commission's Directorate-General for International Cooperation and Development (DG DEVCO), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the ETSO Research Group and the OECD/NEA Multinational Design Evaluation Programme (MDEP) made presentations that demonstrated the significance and value of continuous international collaboration.

Strong cooperation among the international organizations is pertinent and necessary to optimize efforts and to make the best use of the available resources and expertise.

Session 2 summary

- The importance of increasing awareness on TSO contributions in support of the regulatory bodies was highlighted.

- Multilateral cooperation among TSOs, in areas such as international R&D activities involving TSOs (e.g. the European Commission Instrument for Nuclear Safety Cooperation, the OECD/NEA Committee on the Safety of Nuclear Installations, ETSON), or support to MDEP, helps ensure a high level of global nuclear safety. Moreover, these activities are necessary to build up and maintain a high level of competence and expertise in a challenging scientific context to support the respective national regulatory needs.

Session 2 recommendation

The IAEA should consider continuing to promote awareness on TSO contributions in support of the regulatory bodies, and encouraging embarking countries to participate in networks involving TSOs.

Session 3 — Role of the TSOs in emergency preparedness and response

Six presentations were made, by Argentina, France, Germany, Romania, Russian Federation and Thailand.

This session discussed the roles of and challenges faced by TSOs in terms of providing support to government authorities competent in emergency preparedness and response. This support is related to assessment, prognosis and monitoring, including managing or supporting the emergency centres in some Member States during an emergency response or related drills and exercises.

TSOs play a wide range of roles in emergency preparedness and response at the national level. This often goes beyond support to the regulatory body.

Recommendations

- Embarking countries are encouraged to define the role of TSOs in the context of national emergency preparedness and response approaches, taking into account the roles of all involved stakeholders as appropriate.
- The IAEA should consider facilitating the sharing of experience at regional (e.g. ETSON, ASEAN) and international levels, as well as on a bilateral basis. In particular, experience gained through involvement in emergency drills and exercises could be shared at the level of the TSO Forum in a dedicated working group.
- The IAEA should consider developing guidance on the role of TSOs in emergency preparedness and response.

Session 4 — Other challenges of TSOs

This session addressed other areas, such as: public engagement, openness and transparency, communication with stakeholders, interfaces between safety and security, safety and security culture, physical protection and capacity building.

Recommendations

The Conference recognized:

- The need for clarification of the role of TSOs in these other areas: transparency versus security, and safety and security interfaces;
- The useful role of TSO expertise in stakeholder involvement in regulatory body activities, noting that the openness and transparency of the TSO safety expertise may enhance regulatory effectiveness;
- That IAEA international cooperation mechanisms (e.g. TSO Forum, Regulatory Cooperation Forum, Global Safety and Security Network) have proven to be very effective platforms and should be continued to address those challenges.

Session 5 — Key components to develop and maintain the technical and scientific expertise

It was discussed and recognized that there is a need to develop and maintain core competencies.

Examples of key components discussed at the Conference include training, tutoring and strategic planning of workload as necessary guidance for meeting future demands for technical and scientific expertise. Training and tutoring programmes may be internal to TSOs or offered by different qualified national or international providers.

Strong partnership with academia (research and higher education), although not elaborated further during the Conference, may in some circumstances add to the long-term preservation and improvement of the expertise.

Session 6 — How to build your technical and scientific capability

This session emphasized that the availability of a national TSO capacity is a powerful tool to consolidate the medium and long-term sustainability of effective regulatory control, particularly in countries where new-build programmes have benefited from extensive technical support from foreign expertise.

The IAEA TSO Initiative was also presented, including the different tools that are currently being developed to support Member States in the design of a national TSO development strategy.

Recommendations

It was stressed that a national TSO capacity building strategy should:

- Be adapted to the institutional landscape of the country.
- Take into account a realistic evaluation of needs in terms of priorities and time frames.
- Include an open approach to the communication needed to link together stakeholders with different cultures (e.g. mission, language, work practice). These stakeholders include suppliers, the regulator, academia, TSOs, etc.
- Make the best use of available possibilities for international cooperation, including through the IAEA, in order to optimize their TSO development decisions in terms of organization, funding system, technical and scientific priorities, staffing and training methods.

IAEA Member States are encouraged to make the best use of the IAEA TSO Initiative to help design their national strategy for TSO capacity building, and to contribute to the ongoing activities of the TSO Forum.

Conclusions of the Brussels TSO Conference

1. The Conference acknowledges the results of the developments undertaken under the auspices of the IAEA TSO Forum on the basis of past TSO Conference conclusions, notably the TSO Initiative, and encourages further progress on them in the following directions:
 - (a) Based on TECDOC-1835, existing IAEA advisory services (including Integrated Regulatory Review Service missions) could be implemented in such a way as to encompass with appropriate in-depth analysis the contribution of TSOs to the challenges faced by the national regulatory system.
 - (b) The finalization and field test of the draft TSO self-assessment tool should enable Member States to practically perform an assessment of their national TSO strategy in reference to TECDOC-1835.
 - (c) A test of the “national TSO workshop” approach as recommended by the TSO Forum should be carried out in the near future in cooperation with a candidate Member State.
2. The Conference encourages Member States to support the TSO Initiative and to take advantage of the specialized advice on strategic issues relevant to TSOs, in order to contribute to setting up a suitable TSO capability at national level.
3. The Conference recommends that the TSO Forum further address the following aspects of potential TSO contribution to the independence and sustainable effectiveness of the national regulatory system:
 - (a) The role of TSOs in activities of regulatory bodies communicating with stakeholders, noting that the openness and transparency of the safety expertise may enhance nuclear safety.
 - (b) The role of TSO expertise in providing independent advice or recommendations to the regulatory bodies about state of the art safety assessment tools and methodologies, and technical and staff capabilities.
4. The Conference highlighted TSOs’ need for effective and sustainable research, education and training, and knowledge management to feed and sustain expertise in the long term, to better support regulatory systems. The TSO Forum could consider how to encourage embarking countries to address the above-mentioned priorities in the development of strategic plans and roadmaps for building up an independent and sustainable TSO in the long term.