Safety of Nuclear Installations

Objective

To support Member States in improving the safety of nuclear installations during site evaluation, design, construction and operation through the development and maintenance of an up to date set of safety standards and providing for their effective application. To support Member States in establishing and enhancing their safety infrastructure through review services, and in improving the safety of nuclear installations by assisting their adherence to, and facilitating implementation of, the Convention on Nuclear Safety and the Code of Conduct on the Safety of Research Reactors. To support Member States in capacity building through education and training, and by encouraging the exchange of information and operating experience and international cooperation, including enhanced coordination of research and development activities.

Regulatory Infrastructure for Safety

The Agency conducted three virtual expert missions to Egypt, Morocco and South Africa to review the integrated management system of each country's regulatory body.

A working group was established to take forward the lessons learned from previous Integrated Regulatory Review Service (IRRS) missions to review the implementation of the Tailored Module for Countries Embarking on Nuclear Power Programmes. Guidance for the IRRS Tailored Module was also developed to improve its effectiveness.

Convention on Nuclear Safety

The Agency facilitated a meeting for the Officers of the Eighth Review Meeting of the Contracting Parties to the Convention on Nuclear Safety to consider the conduct of the Eighth Review Meeting and all related issues thereto. However, owing to the COVID-19 pandemic travel restrictions, and after extensive consultations the Review Meeting was postponed twice during the year, until 2023.

Design Safety and Safety Assessment

The Agency held a Technical Meeting on Safety Aspects of Using Smart Digital Devices in Nuclear Systems. It also organized a Technical Meeting on Current Practices in Performing Comprehensive Evaluations of Safety and Periodic Safety Reviews of Nuclear Power Plants.

At the virtual Technical Meeting on the Application of the New IAEA Principles for Design Safety of New Nuclear Power Plants, Member States shared their national practices in the implementation of Agency Safety Requirements and supporting Safety Guides

in the design and licensing of new nuclear power plants. The Agency also organized a virtual Technical Meeting on the Enhancement of Methods, Approaches and Tools for Development and Application of Probabilistic Safety Assessments.

The Agency completed a Technical Safety Review of Nigeria's draft regulations for the design and construction, commissioning, safety of operation, and decommissioning of nuclear power plants.

The Agency continued developing publications relating to safety assessment and analysis of small modular reactors and published *Applicability of Design Safety Requirements to Small Modular Reactor Technologies Intended for Near Term Deployment* (IAEA-TECDOC-1936).

Safety and Protection against External Hazards

The Agency held a virtual Technical Meeting on Accident Management for Advanced Reactors where participants discussed the applicability of *Accident Management Programmes for Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-54) to advanced reactor designs, either water cooled or non-water cooled.

The Agency held a Technical Meeting on Protection of Nuclear Installations Against External Hazards. It also published *Methodologies for Seismic Safety Evaluation of Existing Nuclear Installations* (Safety Reports Series No. 103).

Operational Safety of Nuclear Power Plants

The Agency organized a Technical Meeting on Use of Periodic Safety Reviews in Support of Long Term Operation Safety Assessments. It also held a meeting of the International Generic Ageing Lessons Learned (IGALL) Steering Committee as well as nine workshops and eight IGALL meetings to support operators, regulators and other organizations in ageing management and long term operation.

At a virtual technical meeting of the national coordinators of the Incident Reporting System for nuclear installations (co-organized with the Nuclear Energy Agency), participants shared operating experience from significant events reported through the system. The seventh edition of the joint Agency–Nuclear Energy Agency report *Nuclear Power Plant Operating Experience* was published, providing an overview of lessons learned by operators during the 2015–2017 period.

The Agency organized a CANDU Senior Regulators Meeting to share operating and regulatory experience of Canada deuterium–uranium (CANDU) type reactors.

The Agency published *Safety Culture Practices for the Regulatory Body* (IAEA-TECDOC-1895) as well as 'A Harmonized Safety Culture Model', jointly developed with the World Association of Nuclear Operators and the Institute of Nuclear Power Operations. The model is a comprehensive tool intended for all organizations that deal directly or indirectly with ionizing radiation, enabling them to set goals, implement changes and measure progress.

The Agency held the International School of Nuclear and Radiological Leadership for Safety in Tokyo. It also conducted other activities to assist Member States in strengthening leadership, safety management and safety culture for nuclear facilities and regulatory bodies, including an expert mission on leadership and management for safety to the Zaporizhzhya nuclear power plant in Ukraine (Fig. 1) as well as two virtual training courses.

FIG. 1. Agency expert mission on leadership and management for safety to Ukraine in January.

Safety of Research Reactors and Fuel Cycle Facilities

The Agency provided further guidance on the implementation of the Code of Conduct on the Safety of Research Reactors, including a new publication entitled *Reliability Data for Research Reactor Probabilistic Safety Assessment* (IAEA-TECDOC-1922). In addition, the Agency published *Periodic Safety Review for Research Reactors* (Safety Report Series No. 99), providing guidance on and examples of this review process.

The Agency held the eighth Annual Meeting of the Regional Advisory Safety Committee for Research Reactors in Asia and the Pacific as a virtual event. It also conducted a virtual workshop to share information on regulatory review, assessment and inspection of research reactors between the Arab Network of Nuclear Regulators and the African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology.

An eight day Integrated Safety Assessment of Research Reactors (INSARR) mission to the 10 MW LVR-15 research reactor operated by the Research Centre Řež in the Czech Republic was the first Agency peer review and advisory service mission held on-site since the start of the COVID-19 pandemic.

The Agency held a virtual Technical Meeting for the National Coordinators of the Joint IAEA–OECD/NEA Fuel Incident Notification and Analysis System (FINAS). At this meeting, participants discussed important lessons learned from events reported to FINAS and shared their views on further enhancement of operating experience effectiveness. The Agency also issued the new publication *Operating Experience from Events Reported to the IAEA/NEA Fuel Incident Notification and Analysis System (FINAS)* (IAEA-TECDOC-1932), covering the feedback from operating experience of nuclear fuel cycle facilities since the establishment of FINAS.