

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 of safety standards and providing for their application. To support Member States in establishing and strengthening the safety infrastructure including through safety reviews and advisory services. To assist adherence to, and facilitate implementation of, the CNS and the Code of Conduct on the Safety of Research Reactors. To support Member States in capacity building through education and training, encouraging the exchange of information and operating experience as well as international cooperation including the coordination of research and development activities.

Regulatory Infrastructure for Safety

The Agency promotes the sharing of regulatory knowledge and experience to help Member States fulfil their responsibilities. In this regard, it organized the annual plenary meeting of the Regulatory Cooperation Forum (RCF), held in Vienna, and conducted five missions, to Bangladesh, Belarus, Morocco, Nigeria and Poland, to review the current status of regulatory infrastructure development for a new nuclear power programme and to identify RCF support plans (Fig. 1).

Participants in a technical meeting on building a regulatory framework for the oversight of new nuclear power plants, held in Vienna, shared national experience. The Agency also held a regional workshop on the Integrated Review of Infrastructure for Safety (IRIS) self-assessment methodology and software tool, in Hanoi, and an Interregional Training



FIG. 1. Participants in the Regulatory Cooperation Forum meeting with the Bangladesh Atomic Energy Regulatory Authority.

Course on Promoting Effective Interaction Among Nuclear Industry, Regulatory Body and Stakeholders in Countries Introducing or Expanding Nuclear Power Programmes, in Tokyo and Tsuruga, Japan.

Two workshops organized for the Europe region were aimed at developing facility inspection skills. Participants in the first workshop, held in Vienna, evaluated a project on enhancing inspection capabilities. The second workshop, held in Skopje, focused on conducting interviews during inspections. The Agency also held a Workshop on Safety Review and Inspection Methodologies for Quality Assurance for the Asia and the Pacific region, in Daejeon, Republic of Korea.

Other activities organized during the year included two regional workshops held in Jakarta: on the establishment of an integrated management system in regulatory bodies, and on the management of training systems for nuclear and radiological safety. In addition, the Agency conducted a workshop in Vienna to develop a nuclear safety knowledge management programme for regulatory bodies.

Technical meetings held focused on developing case studies and country specific examples on the safety and security interface for the oversight of nuclear power plants, and stakeholder involvement and communication for new and expanding nuclear power programmes. The Agency also organized the CANDU Senior Regulators' Meeting, in China, and a meeting of the Steering Committee on Regulatory Capacity Building and Knowledge Management, in Vienna.

Convention on Nuclear Safety

Officers of the Seventh Review Meeting of the Contracting Parties to the Convention on Nuclear Safety (CNS) shared experience and feedback on the preparations and conduct of the previous review meetings with the Officers elected for the CNS Eighth Review Meeting, scheduled for 2020.

At an additional CNS Officers' Meeting, held in Vienna, Officers discussed the organization of topical sessions on safety culture and aging management, and considered the possibility of using an electronic tool for handling questions.

Design Safety and Safety Assessment

The Agency issued revised Technical Safety Review (TSR) service guidelines, developed to consolidate the services provided and to streamline, harmonize and formalize the process of conducting TSRs.

At a Technical Meeting on Multi-Unit Probabilistic Safety Assessment (MUPSA), held in Vienna, participants exchanged information regarding current practices and provided feedback on a draft Safety Report on the MUPSA methodology. The Safety Report was finalized in December.

The Agency also held a Technical Meeting on the Safety Demonstration and Licensing of Passive Safety Features in Water Cooled Reactors in Vienna.

Participants in a technical meeting on the management of direct current power systems in safety electrical systems for nuclear power plants, held in Vienna, exchanged experiences on their operation, maintenance and use. The Agency also held a regional workshop on the application of digital instrumentation and control systems at nuclear power plants in Bucharest. Participants shared experiences in design modifications, ageing management, obsolescence and operating experience.

At a technical meeting on safety assessment of small modular reactors, held in Vienna, participants shared experiences and provided feedback for the development of a Safety Report. A workshop on design, safety assessment and site evaluation of small modular

reactors was held for the Europe region in Vienna. The Agency also facilitated two meetings of the Small Modular Reactor Regulators' Forum; the Forum approved the interim reports of the working groups on licensing issues, design and safety analysis, manufacturing, commissioning and operation.

Safety and Protection against External Hazards

The Agency held an Asian Nuclear Safety Network Regional Meeting on Seismic Hazard Analysis for Nuclear Installation Sites in Hanoi and a Technical Meeting on Safety in Site Evaluation and Design to Protect Nuclear Installations against External Hazards in Vienna.

At a technical meeting held in Vienna, participants provided feedback for the revision of the publication *External Human Induced Events in Site Evaluation for Nuclear Power Plants* (IAEA Safety Standard Series No. NS G 3.1).

Operational Safety of Nuclear Power Plants

In cooperation with the Nuclear Energy Agency, the CANDU Owners Group and the World Association of Nuclear Operators, the Agency held a technical meeting on sharing operating experience and highlighting lessons from events reported through the Incident Reporting System in Paris. Also, with the CANDU Owners Group, the Agency held a technical meeting on exchange of operational safety experience of pressurized heavy water reactors in Gyeongju, Republic of Korea.

To support operators, regulators and other organizations in ageing management and long term operation, the Agency conducted 3 technical meetings, 22 workshops and supporting missions, as well as 8 meetings in the framework of the International Generic Ageing Lessons Learned (IGALL) programme.

Other technical meetings addressed current practices in the transition from emergency operating procedures to severe accident management guidelines and strengthening leadership and management for the safety of nuclear facilities and regulatory bodies.

A joint course with the Abdus Salam International Centre for Theoretical Physics, held in Trieste, Italy, explored scientific novelties in the phenomenology of severe accidents in water cooled reactors.

Safety of Research Reactor and Fuel Cycle Facilities

The Agency continued to help Member States in fulfilling their safety obligations through activities aimed at sharing information and experience. This included the organization of a meeting on the application of the Code of Conduct on the Safety of Research Reactors for the Europe region, held in Brussels. The Agency also organized the International Conference on Research Reactors, held in Buenos Aires. The conference provided a forum for sharing information on the effectiveness and sustainability of research reactors.

Five Agency technical meetings held in Vienna addressed topics relating to the safety of research reactors and fuel cycle facilities. Among them were meetings on digital instrumentation and control systems for research reactors, and for the national coordinators of the Incident Reporting System for research reactors. At a meeting on the safety of research reactors, participants discussed safety performance indicator reports and explored options to enhance safety. Another meeting focused on areas where safety and security aspects need to be managed at different phases in a nuclear fuel cycle facility's lifetime, and shared national experience in regulatory capabilities. Participants in a meeting on ageing

management for nuclear fuel cycle facilities discussed safety aspects and shared national experience on the establishment of systematic programmes.

The Agency held the annual meeting of the Regional Advisory Safety Committee for Research Reactors in the Asia and the Pacific region, in Sydney, Australia, and the annual meeting of the European Advisory Safety Committee for Research Reactors in Warsaw. It also organized an Asian Nuclear Safety Network regional meeting on periodic safety reviews for research reactors, in Chicago, United States of America, and a regional meeting on self-assessment of research reactor safety, in Cairo.