

# **Main Conclusions and Recommendations of International Conference on Topical Issues in Nuclear Installation Safety: Ensuring Safety for Sustainable Nuclear Development**

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### **1. INTRODUCTION**

In 1991, the IAEA organized an International Conference on the Safety of Nuclear Power: Strategy for the Future. Recommendations from that conference prompted actions in subsequent years that advanced the safety of nuclear installations worldwide, and included the establishment of the Convention on Nuclear Safety, which entered into force in October 1996.

In 1998, the IAEA sponsored an International Conference on Topical Issues in Nuclear, Radiation and Radioactive Waste Safety. In response to the concerns identified and the recommendations provided by the conference, actions were taken to improve the monitoring of safety by: developing performance indicators; furthering the use of probabilistic safety insights to complement and help optimize the prescriptive nature of regulations in the field of radiation protection and addressing actions needed to ensure the future availability of competent professionals.

In 2001, the IAEA sponsored an International Conference on Topical Issues in Nuclear Safety. The findings were again essential in providing the IAEA and the nuclear industry with insights as to where future activities should be focused. Recommendations addressed: the need to develop international guidance on the use of probabilistic safety insights; the potential negative impacts on safety from natural and man-made external factors; the need for emergency preparedness; guidance for fuel cycle facilities; the safety challenges associated with poor utilization programmes at research reactors; and the need to develop simple indicators of safe operating performance.

In 2004, the IAEA organized in Beijing, China, a conference on Topical Issues in Nuclear Installation Safety with focus on Continuous Improvement of Nuclear Safety in a Changing World. The conference provided valuable input for the development of IAEA nuclear safety programmes. The participants stressed the need for harmonization of regulatory approaches, and inclusion of operational experience in all safety programmes and maintenance of a transparent environment, which is essential for owners-operators, regulators and the public. It was agreed that information technology methods need to be pursued to leverage resources to the maximum degree possible. It was noted that for safety assessments the right balance of deterministic and probabilistic methods during design, operation and regulatory activities is needed.

Safe, secure, peaceful and efficient use of nuclear energy requires sustainable tools, including infrastructure that provides legal, regulatory, technological, human and industrial support for the nuclear programme. A country planning a nuclear programme or currently operating nuclear facilities must develop, maintain or improve safety through the mechanisms of international connectivity, sustainable knowledge transfer and synergy among important programmes to safely and reliably operate and maintain the nuclear power programme. These efforts are necessary to protect the citizens within the country, within neighboring countries, the region and the world.

## **2. OBJECTIVE**

The objective of the conference was to foster the exchange of information on topical issues in nuclear safety, especially on issues that ensure safety for sustainable nuclear development. The conference will identify foundations for international consensus on the basic approaches for dealing with these issues, and will propose recommendations concerning:

- The vital role of national regulators and international organizations in the global harmonization of nuclear safety;
- Opportunities for nuclear development: the perspectives of vendors and operators;
- Safety infrastructure for nuclear programmes;
- Safety management and operational experience feedback; and
- The relationship between safety and security requirements.

## **3. TOPICS**

The main part of the conference was devoted to the following key topical issues which have been identified as subjects for the contributed papers.

### **Topical Session 1: Safety Infrastructure for Nuclear Programmes**

#### **Part 1: Challenges to Safety Infrastructure from Expanding Nuclear Power**

- Legislation and legal instruments
- Regulatory infrastructure
- Nuclear safety infrastructure
- Stakeholders' involvement

#### **Part 2: New Entrants to the World Nuclear Community:**

##### **How do we get there?**

- Considerations before taking the decision to launch a nuclear power programme
- Assessment of infrastructure development status
- Milestones in the development of a national nuclear power programme
- Sharing nuclear infrastructure
- Managing the first nuclear power plant
- The role of research reactors: safety issues and trends

### **Topical Session 2: Safety Management and Operational Experience Feedback:**

#### **How to get better ?**

##### **Part 1: Safety Management and Technical Aspect**

- Building sustainable learning programmes: mutual learning
- Safety culture: overcoming the barriers
- Safety assessment and advances in technology programmes: learning more, getting better

##### **Part 2: Operational Experience Feedback**

- Operational experience: a comprehensive system to improve safety
- Analysing operational experience
- Sharing and implementing the lessons learned from operational experience

## **4. MAIN CONCLUSIONS AND RECOMMENDATIONS**

Over 200 participants from 33 countries and three international organizations came and actively participated and contributed to focused discussions and the success of the conference. The following

points summarize the key conclusions and recommendations of the conference with respect to nuclear safety.

1. The nuclear safety approach is based on the philosophy developed in the 60's: defense in depth principles and deterministic criteria. When properly applied and completed by probabilistic analyses and operational experience feedback, it continues to be a successful approach. However, guarding against the risk of accidents requires constant vigilance and high technical competence and a never ending fight against complacency. In this context, having a strong leadership with a commitment to continuous improvement and a vision of sustained excellence is a key element of nuclear safety. Continuous improvement in safety also should be pursued through scientific research and operational experience feedback.

2. An accident anywhere is of concern to all Member States. Therefore, it is in the interest of all Member States to share and collaborate on safety matters. Participation of all Member States in international nuclear safety instruments and conventions, including liability for nuclear damage, is considered beneficial to global safety. The Convention on Nuclear Safety, the Joint Convention, international cooperation through IAEA and other organizations, bilateral or multilateral arrangements are important elements for establishing networks for sharing and transferring knowledge. It is acknowledged that the IAEA's Safety Fundamentals and Safety Requirements provide a sound foundation for high level nuclear safety.

IAEA Safety Standards should be the basis for the establishment and maintenance of safety infrastructure. The IAEA's peer reviews and services such as IRRS, OSART, Site Evaluation and Reactor Safety Reviews provide also a valuable platform for sharing experience and harmonising safety approaches among Member States. However there is still a need to build on international cooperation in order to promote sharing of experience and knowledge for practical enhancement of nuclear safety.

3. Countries embarking on nuclear power programmes assume very important safety responsibilities that cannot and must not be delegated. Therefore, the establishment of a sustainable national safety infrastructure is an essential foundation for ensuring safe design, construction, operation and decommissioning of nuclear power plants. The process involves the development of a strong governmental, legal and regulatory framework as well as the necessary education and training, technical capacity building and integrated approach to safety, and safety management for all nuclear stakeholders.

Vendor countries (vendors and regulators) that are supplying nuclear technology, materials and equipment to the new entrants have moral responsibility and common interest towards these countries and as such should contribute to the creation of strong safety infrastructures in the recipient countries. IAEA should support this process. Specific IAEA safety guides for countries embarking on nuclear power should be enhanced or developed and tailored safety reviews should be prerequisite at different stages of newcomer programme development. IAEA should also develop and provide to the newcomers appropriate training programmes to assure development of safety capacity. Other countries could also provide useful input particularly if they are involved in similar projects.

4. Operating Experience Feedback is an important element of the continuous safety improvement process for nuclear power plants. OEF databases should be analyzed and used more extensively and the lessons learned disseminated and applied among the Member States.

All Member States, through their regulatory bodies, have the joint responsibility to adopt the OEF lessons learned in their respective nuclear programmes. National safety authorities could take the initiative of organizing international workshops on how OEF has been used and implemented. Moreover, lessons learned from new construction should be provided and shared between all countries embarking and considering new build.

5. It is vital in today's environment that the synergies between safety and security are maximized, and that culture be developed that integrates safety and security requirements. Safety and security have the same purpose: protecting people, society, environment and both could be based on similar principles even if there are some differences in implementation such as openness and transparency. There are important advantages from integrating the regulation of safety and security as much as possible.
6. The quality of the supply chain is an emerging issue. Harmonization of safety requirements, design codes and quality standards within the supply chain is acknowledged as requiring further collaboration among Member States, international organizations and supplier companies. Multinational Design Evaluation Programme (MDEP) is an important first step towards this goal.
7. Transparency, collaboration, information sharing and openness is responsibility of all Member States to assure not only safety but to foster confidence and trust among all stakeholders.
8. Despite NPPs high level of safety, emergency preparedness and response is an important issue in the context of developing nuclear energy. Through international cooperation, emergency and response plans need to be developed and well coordinated within all relevant entities.
9. In the context of developing nuclear energy the generation gap in education and training as well as the necessity to build technical capacity to properly address safety issues has been acknowledged by the Conference. Therefore, adequate education and training programmes should be developed and implemented.