



International Atomic Energy Agency

Topical Issues Conference

*Continuous Improvement of Nuclear Safety in a
Changing World*

Beijing, China 18-22 October 2004

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Section**

Content of the presentation

- **Conference preparation**
- **Participants**
- **Summary of topical issues**
- **Panel discussion**
- **Conference conclusions**
- **DDG summary**
- **IAEA activities**



TOPICS

- **Topical Issue No. 1:** Changing Environments – Coping with Diversity and Globalization
- **Topical Issue No. 2:** Operating Experience – Managing Changes Effectively
- **Topical Issue No. 3:** Regulatory Management Systems — Adapting to Changes in the Environment
- **Topical Issue No.4:** Long Term Operations – Maintaining Safety Margins while Extending Plant Lifetimes



PROGRAMME STRUCTURE

- **Opening session**
- **Four technical sessions**
- **Poster sessions**
- **Panel discussion ‘Safety Management and Safety Culture in Nuclear Installations’**
- **Concluding session**
- **Technical tour-research reactors**



PARTICIPANTS

- 274 participants, two thirds from foreign countries
- 37 countries
- 5 international organizations
- 10 observers
- 10 members of press
- 67 selected contribute papers
- **Valuable TC support**



PARTICIPANTS cont.

- **Opening: H.Zhang-CAEA, T.Taniguchi-IAEA**
- **President: R.A.Meserve USA Carnegie Inst.**
- **5 Keynote addresses: (L.Echavarri-NEA, W.Cavanaugh-WANO, N.J.Diaz-USNRC, S.Matsuura-NSC Japan, G.Li-NNSA China**
- **41 speakers: (IAEA-J. Versteeg, H. Werdine, D.Delattre, R.Havel**



... on Topical Issues

Improvement of Nuclear

全专题国际大会在

International Atomic Energy Agency

Government of China: China Atomic Energy

National Nuclear

... Clear Installation Safety:

in a Changing World

世界中持续改进核安全

国际原子能机构

国家原子能机构, 中国国家核安全局

18

International Conference on
Topical Issues in
Nuclear Safety











Topical issue 1 summary

- Globalization calls for **more harmonization** of regulatory requirements, where appropriate. Efforts in this direction are pursued at the regional levels, acknowledging that harmonization doesn't mean uniformity. The role of the **IAEA Safety Standards** in building an international nuclear safety regime has also increased.

Topical issue 1 summary cont.

- The regulatory community will benefit strongly from cross-fertilization between the regional/multinational efforts and the international developments of **more users friendly safety standards** that take into account the feedback from different users. Consideration should also be given to mapping the coverage and identifying differences and gaps between **IAEA and industrial safety standards**.



Topical issue 1 summary cont.

- There is a need to build on the **IAEA Safety Standards** to provide vendors, operators and regulators with international standards for design and operation of nuclear installations:
 - There is a need to develop a process whereby regulatory bodies can get together to assess and **agree on a design** so that the design can be accepted in any country.
 - There was disagreement as to whether **design certification** was an appropriate way forward. Design certification is only part of the process. Ultimately national regulatory bodies are responsible for licensing the plants.

Topical issue 1 summary cont.

- It was also agreed that globalization and the provision of reactors to states with no ‘vendor’ knowledge need to address the question of **who owns the ‘design’**. That is, there is a need to maintain detailed knowledge for 50-60 years.
- **Communication** with the public was addressed in most presentations as an issue that warrants a dedicated strategy.

Topical issue 2 summary

- The process for identifying **minor events—low level and near misses** is a repository of lessons to be learned, and their use should be stimulated by the IAEA. However, care should be taken in order to avoid an **enormous data bank**, that could be difficult to use.

Topical issue 2 summary cont.

- **Recurring events are taking place. Based on this fact, strong efforts should be made to **share the operating experience about incidents faster and more comprehensively**. The international organizations – IAEA, WANO and NEA should join efforts, to improve or revise the actual processes in place.**



Topical issue 2 summary cont.

- **Self-assessments** are excellent tools for managers and senior executives to verify actual operational safety performance. The international organizations – IAEA and WANO, should more intensively promote the use of the self-assessment process, by both utilities and regulators. International peer reviews such as OSART and WANO Peer reviews and the IAEA service dedicated to this theme, PROSPER, could help.



Topical issue 2 summary cont.

- IAEA is encouraged to promote **workshops and seminars** on the results of the safety reviews concerning operating experience, as well as on the area of recurring events. Such seminars should be timely and include the candid participation of all organizations involved.

Topical issue 3 summary

- The globalization of the energy market and the resulting changes in the structure and the management of the operating organizations lead the regulatory bodies to adapt their **strategies**. Particular attention is requested for ensuring the **qualification** of the operating organizations and reviewing and inspecting the organizational performance in achieving and maintaining a high level of safety for the short term and the long term.

Topical issue 3 summary cont.

- Regulatory bodies are now implementing self-assessment as one methodology toward ensuring continuous improvement. The **IRRT** missions, provide a unique opportunity to stimulate this continuous improvement process. The Conference supported the proposal to develop an advanced IRRT service based on peer-review of self-assessments. It was also presented by the IAEA, that the regulatory bodies of countries with nuclear power programmes should consider inviting an IRRT mission by the end of 2012.

Topical issue 3 summary cont.

- With regards to the use of probabilistic approaches, the presentation and discussions highlighted the progress achieved but also the difficulties encountered, in particular in ensuring an acceptable level of **quality of the PSA studies and in communicating PSA results to the public**. The conference concluded that there is a need to establish a better balance in using, in a **complementary manner**, both deterministic and probabilistic approaches.

Topical issue 4 summary cont.

- **Strengthening international activities between IAEA, Regulatory Authorities and utilities can provide benefits to those countries that are at different stages of addressing the issue of **license renewal and long term operation**. The EBP SALTO can provide adequate guidance on the scope and content of activities to ensure safe long term operation.**

Topical issue 4 summary cont.

- It is of high importance to create **international data bases** on ageing related lessons learned, containing experience gained from the long term operation of nuclear facilities, as well as results from international research programmes.

Topical issue 4 summary cont.

- In addition to technical issues, **loosing the competence** is one of the key future challenges. Conceptual solutions need to be developed.
- Further work and in particular international co-operation is needed to **harmonize requirements** on adequate safety level to be achieved and maintained during long term operation.

Panel discussion

- How to enhance safety consciousness and how to **improve safety culture level and safety culture program**. There are different approaches among Member States to national culture and company culture to influence our effort to promote nuclear safety culture. And how can we overcome these differences.



Panel discussion

- How the IAEA can be more supportive in areas of **experience feedback** and international cooperation.
- How to strengthen our **infrastructure** of nuclear industry. Specifically, we should think about constitutional memory and knowledge management.



Topical Issues Conference Conclusions

The need to harmonize regulatory approaches:

- There is a need to build on the IAEA Safety Standards to provide vendors, operators and regulatory authorities with internationally accepted standards;
- The question of how to harmonize the transition point between safety standards and industrial standards;
- Role of the IRRT to act as a vehicle to promote regulatory consistency. Emphasis on the new IRRT process that addresses self-assessment;



Topical Issues Conference Conclusions

- **The need to establish the right balance in using, in a complementary manner, both deterministic and probabilistic approaches during design, operations and regulatory activities;**
- **Globalization and the provision of reactors to Member States with no vendor knowledge calls into questions who “owns” the design, who is responsible for providing the necessary focus (decision-making and resources) on safety and security.**

Topical Issues Conference Conclusions

Concept of Operational Experience and the need to foster an environment conducive to becoming “learning organizations”:

- **Maintaining a transparent environment is essential, both with other owner-operators, with the regulatory authorities and with the public;**
- **Recurrent events are taking place! How to we ensure that the lessons learned in the past are not forgotten during the present and lost in the future?;**



Topical Issues Conference Conclusions

- **The process for identifying “low level” and “near miss” events must be stimulated and serve as repositories of lessons learned for all members of the nuclear community;**
- **Artificial barriers to sharing safety related information need to be breached. This includes addressing proprietary, technical and political factors that stand in the way of information sharing;**

Topical Issues Conference Conclusions

- **Lessons learned are not unique to any specific period in the life cycle of a nuclear installation or any particular type of nuclear installation. Knowledge must be shared during design, construction operational and decommissioning phases of all facilities;**
- **Likewise, lessons learned are not unique to any particular industry. All sources of lessons relative to material and process safety insights must be pursued.**

Topical Issues Conference Conclusions

The concept of extended operations:

- It was accepted that for safe long term operations, the safety analysis must show that the plant will continue to operate within its design envelope. Thus, there is a need for:
 - Sound knowledge of the current design basis;
 - Accurate knowledge of the actual state of the plant;
 - Verification that adequate safety margins will be maintained;
- Long term operations must consider the concept of ageing management in its broadest context, addressing both material (pumps, valves, etc.) and personnel (knowledge) issues.

DDG Summary

- **We must continue our efforts at developing standards for all safety thematic areas and for all types of nuclear installations.**
- **We must keep them current and user-friendly by actively incorporating feedback to meet the changes in technology and the needs of our Member States.**
- **We will continue to seek ways to assure that the standards are applied effectively and universally throughout the world.**

DDG Summary

- **We must seek out ways to share lessons learned in as deep and wide a manner as possible.**
- **Self-sustaining networks within and between Member States based on strategic knowledge management is a key vehicle to achieve this objective.**
- **The Asian Nuclear Safety Network, supported in China by the BINE, CAEA and NNSA (among others) is the flagship of the IAEA's safety networks. The proceedings and results of this conference will be a key input to this network.**



DDG Summary

- **It is essential that international legal instruments such as the Convention on Nuclear Safety are incorporated into the improvement suggestions on the global safety regime that have been proposed.**
- **The IAEA will share the insights of this conference with the contracting parties and will work to engage them, as appropriate.**

DDG Summary

- **Further enhancement of the IAEA peer reviews, OSART and IRRT in particular, was also widely perceived to be another very effective way to promote the sharing of lessons more in depth.**
- **Finally, all the valuable suggestions and insights of this conference regarding the future activities of the IAEA will be duly reflected in the planning and implementation of the Agency's future programmes.**



IAEA Activities

- **“The identification of the key challenges by these renowned experts at the conference will assist us in providing the support needed to continue the improvement of nuclear safety worldwide”, said Ken Brockman, IAEA Director of the Division of Nuclear Installations Safety .**
- **Develop an action plan to address Conference conclusions**
- **Publication of Conference Proceedings**



IAEA web-sites

- <http://www-ns.iaea.org/home/nis.htm> now includes the updated summary and link,
- <http://www-ns.iaea.org/meetings/nisummaries/top-issues-2004-Oct.htm#documents> is the complete set of conference info, and
- <http://www-ns.iaea.org/meetings/pastmeetings.htm> now includes this major conference in the listing.

