

# Lessons from 40 years of nuclear safety and regulation

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The year 2005 marks 40 years of successful multilateral exchanges through NEA committees concerned with nuclear safety research and regulation. The first multilateral safety committee set up in 1965 under the European Nuclear Energy Agency (forerunner to the NEA) was the Committee on Reactor Safety Technology (CREST). The first CREST meeting covered major technical issues of the time such as depressurisation accidents, shock in reactor structures (TNT tests), hot particle problems (fuel elements) and the initiation and propagation of cracks in pressure vessels. Restructuring took place in 1973 when the Committee on the Safety of Nuclear Installations (CSNI) was set up to replace CREST.

The mandate of the newly created CSNI stated that it was responsible for examining technical aspects of nuclear installations and for establishing a dialogue between regulators and research organisations with the dual purpose of assisting in the definition of research objectives and providing feedback

on research results to nuclear regulators. The CSNI Subcommittee on Licensing was to provide a forum for licensing authorities, covering aspects that were not strictly technical or scientific in nature.

By the end of the 1980s, it became evident that the public was becoming concerned with regulatory practices. In response, there was a growing appreciation among regulators in OECD/NEA member countries of the need to demonstrate that regulatory practices had a consistent technical basis that led to uniformly high standards, and that, in fact, differences in these practices were more apparent than real. In addition, the expanding body of operational experience and lessons learnt could be applied to regulatory practices, and the accumulation of regulatory experience provided a strong basis for exchanging information and understanding on national approaches. Following discussions in the CSNI and other NEA committees, and NEA Steering Committee agreement, the Committee on Nuclear Regulatory Activities

(CNRA) was created in 1989 to guide the NEA's programme concerning the regulation, licensing and inspection of nuclear installations with regard to safety.

## The NEA Safety and Regulation Forum

In commemoration of 40 years of successful co-operation on nuclear safety issues, the CSNI and the CNRA joined together this past June to reflect on what has been learnt; what challenges are foreseen in the future; and whether the NEA arrangements that, in conjunction with other international organisations, have served the international community well in the past, remain appropriate for future challenges. This reflection took place within the NEA Safety and Regulation Forum on Multilateral Co-operation in Nuclear Safety Research and Regulation.

Over 100 participants attended the NEA Forum, which was held on 14-15 June 2005 in Paris. Among the senior-level participants were 13 chief regulators and 7 heads of research organisations from NEA member countries. Prof. Jukka Laaksonen, CNRA Chairman and Director-

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General of STUK, the Radiation and Nuclear Safety Authority of Finland, and Mr. Ashok Thadani, CSNI Chairman and Deputy Executive Director of the Advisory Committees of the United States Nuclear Regulatory Commission, co-chaired the Forum.

Keynote addresses were made by Dr. Nils J. Diaz, Chairman of the US Nuclear Regulatory Commission, on *The Next Forty Years, Multi-national Design Approval Programme*, and Dr. Kazuo Matsunaga, Director-General of Nuclear and Industrial Safety of Japan, on *Today's Challenges: Essence of Changes*. Dr. Serge Prêtre, Former Director of the Swiss Nuclear Safety Authority, set the scene by presenting *Forty Years of Nuclear Safety*.

The Forum sessions were: *What Have We Learnt; Learning from Each Other – International Approaches*; and *The Way Forward*. Delegates also participated in smaller dis-

cussion groups to look more closely at how the safety committees should respond to new information and at ways to improve international harmonisation of nuclear safety practices and approaches. A special discussion group was formed, consisting of experienced committee members and nuclear professionals from the younger generation. This group's goal was to develop an outlook on the future of nuclear safety from different generational viewpoints. Each of the groups derived a number of key findings described in the following paragraphs.

### *Response to new information*

The objective was to explore specific ways in which the committees can respond in a timely manner to their members' needs regarding international regulatory research and sharing regulatory developments. The groups noted that

one of the main challenges was to be able to filter numerous sources of information (e.g. from operational events, research results, PSA results, and so forth) to identify significant safety issues and bring them to the attention of the committees. Raising awareness about these potentially significant safety issues and building consensus among regulators and researchers is an important part of the added value of international committees.

In order to achieve this, it is necessary: to have and maintain key research facilities to deal with current and future problems; to improve knowledge management by disseminating and sharing information; to ensure proper project management and long-term planning, including adequate resource allocation; and to base these research programmes on industry needs and safety concerns.

### *International harmonisation*

The main objective in this area was to look at how the committees could contribute, together with other organisations, to furthering the international harmonisation of nuclear safety standards. The groups defined the need to have common technical and legal grounds across markets globally, including a high level of safety principles for both existing and new plants. While the bases for this should be the IAEA Safety Guides, the NEA committees should also use and build upon work currently being performed, such as that by the Western European Nuclear Regulators Association (WENRA). In addition, new initiatives were presented like the Multinational Design Approval Programme (MDAP), that may contribute to convergence of national regulatory practices.

The processes used for reviewing and comparing international safety standards and safety issues help lead to a common safety level among countries. The groups reflected a positive attitude towards future convergence in this area.

### *The younger generation*

The goal of this group was to have a cross-generational discussion on important areas of nuclear safety which will need to be dealt with in the future. The group recognised that up until now, the main issues and decisions relating to nuclear safety have been determined by the older generation. The challenges as well as responsibility concerning nuclear safety in the future will increasingly be managed by the new, younger generation of nuclear experts. It was clear from the discussions that nuclear safety must be guaranteed in competitive electricity markets. It was also noted that new safety requirements to be developed must consider current requirements as a basic premise, in other words, it is not necessary to “reinvent the wheel”.

It was also considered important that, in developing new requirements, technical expertise must be valued on every level. As it was pointed out by the group, not everyone can be a manager, but useful results can be derived from all levels of expertise. The group also recommended that the committees strive to obtain more international participation by younger members.

### **Celebrating 40 years of co-operation**

The Special Session Celebrating 40 Years of Multilateral Exchange in Nuclear Safety at the Nuclear Energy Agency

was co-chaired by Prof. Lars Högberg, Former CNRA and NEA Steering Committee Chairman, and Prof. Adolf Birkhofer, former CSNI Chairman. The panel for this session consisted of former members of the CSNI and the CNRA who recalled personal experiences in the nuclear safety area, and the key issues that have been subject to international co-operation in nuclear safety research and regulation.

In particular, the panel looked at how the CSNI and the CNRA had handled these issues, concentrating on what happened and sharing some anecdotes. This included how the committees responded to major events, such as Three Mile Island and Chernobyl, as well as their responses to significant safety concerns (risk assessment, fire protection, international reporting systems) and to the evolution from purely technological issues to those that now concern policy as well. The discussions in this panel also provided a unique opportunity to pass on messages to the younger generation.

### **The way forward**

While a wide array of insights were obtained by the participants throughout the Forum, the preliminary conclusions focused on four main issues:

- the need to continuously improve operating experience feedback;
- the need to obtain convergence between countries in nuclear safety practices;
- the need to conserve nuclear safety research; and
- the need to ensure good knowledge transfer.

The fact that both the CSNI and the CNRA have been at

the forefront of these issues is indicative of their search to meet the needs of member countries and of their accomplishments in this regard. Some examples of what the NEA is doing in these areas, and how, are:

- The CNRA is preparing an overview of regulatory challenges in using operating experience, and an international conference is scheduled to take place in May 2006 in Cologne, Germany to discuss ways to improve nuclear safety through operating experience feedback.
- The NEA is also engaged in ongoing discussions concerning convergence of safety practices in relation to the US Nuclear Regulatory Commission proposal on a Multinational Design Approval Programme (MDAP).
- The CSNI is conducting a new study on safety research and research facilities, aiming to provide the necessary strategy for maintaining key research facilities.
- As a follow-up to past work on maintaining competence, a Workshop on Human Resource Management in Safety and Regulation was organised in October 2005.

While final conclusions still need to be developed, it can already be said that there are higher expectations on the safe use of nuclear energy today than in the past, and that nuclear safety concerns many actors and stakeholders. Listening to them is the new challenge, and many different experts need to be consulted (pluralistic expertise). In doing so, however, essential safety goals cannot be jeopardised as we move into the next 40 years of nuclear safety and regulation. ■