Meeting Report

Preparatory Consultancy for the International Conference on Knowledge Management in Nuclear Facilities (18-22 June 2007)

8-10 February 2006, IAEA, Vienna, Austria

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Background

In recent years, a number of new issues have emerged in Member States, including ageing facilities and personnel, nuclear phase-out policies, the expectation of nuclear growth in some regions, the objective to further improve the economic competitiveness of nuclear energy and shrinkage of government support in some Member States. In response to these challenges, the IAEA General Conference in 2002 adopted a new resolution on "Nuclear Knowledge", emphasizing the importance of nuclear knowledge management in that context. The resolution was reiterated in subsequent years (GC(46)/RES/11B, 2002, GC(47)/RES/10B, 2003 and GC(48)/RES/13, 2004).

Following these resolutions, the IAEA has developed, supported and initiated a number of dedicated projects in the areas of preservation of knowledge, education and training and information exchange and has started to develop methodologies and guidance for use in Member States. In 2004, the IAEA organized the *International Conference on Nuclear Knowledge Management: Strategies, Information Management and Human Resource Development* in France, supported by the Government of France. The conference was attended by 250 experts, scientists and officials from 54 Member States and 9 international organisations.

By 2005, nuclear knowledge management has become an important element of the organizational behavior in the nuclear industry. In support of the nuclear community and all stakeholders in nuclear facilities, and in response to General Conference Resolution GC(48)/RES/13, the Agency is planning to organize the *International Conference on Knowledge Management in Nuclear Facilities* under programmes C.3 and J.2, 18-22 June 2007 in Vienna, Austria.

Objectives

The objective of the consultancy were:

1. to discuss the objectives, scope and content of the conference and to identify adequate ways to meet the objectives set, in particular,

2. as key outcome, to discuss and work out the programme structure of the conference (e.g. panel sessions, plenary and thematic sessions, poster presentations etc);

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3. to compile a list of potential members of the Scientific Committee for the conference (which will be in charge of reviewing the scientific and technical content of conference papers and posters);

4. to discuss and propose options for publishing the conference proceedings and other technical or organizational matters related to the conference.

Work Done

The meeting was chaired by Mr. Alonso. Consultants addressed the issues as planned and outlined above. Invited presentations were given by Messrs. Alonso and Beraha as starting points for the discussion, including proposals for conference objectives and scope. Presentations were also given by Messrs. Speranzini and Nasellu. Selected initial considerations and proposals are given in Annex 1.

Recommended conference objectives

The consultancy recommended the following objective for the conference:

- to reach a clear and common understanding of the benefits of nuclear knowledge management in promoting excellence in safety and operation of nuclear facilities,

- to take stock of the recent developments in nuclear knowledge management, and

- to promote using nuclear knowledge management in nuclear organizations and industry.

The conference will provide a forum for decision makers and professionals in the nuclear industry, from regulators, governments and academia, including in particular all nuclear facilities in all phases of their life cycle, and from other bodies concerned with the topic

- to exchange information and share experience on the application of nuclear knowledge management in nuclear facilities;

- to review and share the achievements, lessons learned and best practices;

- to guide the nuclear community in using knowledge management in nuclear facilities to stimulate innovation, to contribute to economic competitiveness, to increased efficiency and to maintaining a high level of safety.

Recommendations on conference programme and overall organization

A conference programme was worked out based on these objectives and is given in Annex 2.

The consultancy also made recommendations on the setup and overall organization of all sessions, including proposed keynotes, panels, compilation of findings, side lectures and the closing session. Those recommendations are included in Annex 3.

Recommended organisations for cooperation

The following organisations should be considered for cooperation: WANO; EC; WNA/WNU; FORATOM; NEA/OECD; JAEA/JAIF; NEI; EPRI and AECL.

Recommended committee members

The following organisations and persons should be considered as members of the Steering Committee: VGB (Germany); UNESA (Spain); Chakraborty (Switzerland); Ahmand (Pakistan); China; India; CEA (France); Japan; AECL (Canada); EdF (France); NRC (USA); WENRA (Europe); GRS (Germany); INSN (France); ENEN (Europe); ANENT (Asia); ENRESA (Spain); ANDRA (France); British Energy (UK); ROSATOM (Russia) and Brazil. The final selection should have regional distribution and the selection should include major nuclear actors.

The following personalities are recommended for the Scientific Committee: Prof. Nonaka (Japan); Jean Luis Ermine (France); Andre Maisseu (France); Georges van Goethem (EU); Jorge Lan Lengton (Spain); Peter de Regge (Belgium) and K. W. Han (ROK).

Results Achieved

The consultancy recommended conference objectives and a detailed conference programme, including sessions and their content. The consultancy also recommended members of related committees, e.g. the conference Steering Committee and made general recommendations for the conference, e.g. on overall duration and related panels and keynotes.

The most important recommendation is the conference objective as follows:

- to reach a clear and common understanding of the benefits of nuclear knowledge management in promoting excellence in safety and operation of nuclear facilities,
- to take stock of the recent developments in nuclear knowledge management, and
- to promote using nuclear knowledge management in nuclear organizations and industry.

Conclusions and Recommendations

The recommendations made by the consultancy should form the basis for the conference announcement, which is planned to be prepared by the first meeting of the Steering Committee scheduled for June 2006.

Annex 1: Initial considerations

- A general emphasis of the conference should be on practical solutions and approaches (as opposed to NKM theory and general strategic issues).

- There is a need to distinguish between global, national and corporate *goals* in the NKM field.

- Duration: three days, with special events before and after, so that the three days are equally important to everybody.

- There should be panels at the end of each session. A final panel should be conducted at the end, including all session chairs or rapporteurs. The conference chairman will present a final statement on the conference.

- A clear distinction can be made between regular and ongoing activities supported by the Agency in the areas of training and capacity building (e.g. training courses and TC support) and NKM activities to support the education and training processes (rather than the training event itself).

Annex 2: Conference programme

The consultancy recommended a conference programme with the following technical sessions:

Knowledge Management Goals, Strategies and Processes

- The understanding of KM in the nuclear field depends on the activities and responsibilities of the organization. Through the presentation from different actors - authorities, regulators, plant owner/operators, waste processor, designers, suppliers and service companies - the session will address such differences with the aim of reaching a common understanding on KM and its advantages.

- The defined goals and chosen strategies and processes in the different organizations will be discussed with reference to the needs to be addressed.

- The responsibility of senior managers to implement KM goals, strategies and processes will be discussed.

Safety, Performance and Economic Benefits of Knowledge Management

- Nuclear knowledge management is expected to produce tangible benefits in safety of the nuclear installations and to efficiencies in regulatory activities and lead to improved performance and economics. Presenters will demonstrate the link between knowledge management activities and improved safety and regulation, and performance and economics.

- Best practices and internationally recognized safety standards and guides should be shared. This includes international experts networks of excellence, peer reviews and technical meetings to share best practices and lessons learned.

- The role of knowledge transfer from the supplier of nuclear facilities to the operator including the role of the national regulatory bodies in bringing the regulator of importing countries to the same level of knowledge to ensure safety.

- Demonstrate the links between knowledge management and improved safety culture including intangible benefits.

- Consider changing relationships in the face of retirements and economic pressures, for example between vendors, owners, suppliers and maintenance organisations.

Implementation of Knowledge Management – Best Practices and Lessons Learned

- Steps of implementing KM in a nuclear facility including the decision of management, kick off meeting, organizational structure, gathering the relevant

experience and knowledge, and selection and implementation of KM tools. Feedback, difficulties, lessons learned.

- Consideration of a life cycle approach to knowledge management in nuclear facilities and of the need for information to flow seamlessly during the different phases of installation life. For example, on-going or finished projects or measures in operating facilities in terms of reducing incidents, improving safety and performance.

- New build projects and decommissioning projects using KM as a support tool in the field of strategy and work planning.

Infrastructure Supporting Nuclear Information and Knowledge Management

The session focus is on practical examples of methods, techniques and tools in the nuclear field, such as,

- methods for identifying competence areas, and key experts; assessment of knowledge gaps and critical knowledge losses,

- techniques for eliciting and capturing knowledge from leaving experts, and for sharing and transfer of relevant knowledge,

- portal and document management technologies for effectively storing and retrieving nuclear information. Collaboration and communication platforms and tools,

- integration of knowledge management in business and work processes with the goal of maintaining and developing competence levels and reducing future needs for knowledge retention activities.

Knowledge Development and Innovative Approaches

- The role of R&D in knowledge development with specific attention to the design of Gen IV reactor concepts and the advanced design tools needed.

- Advances in “smart” reactor technology to maintain a viable workforce in the face of retirements and economic pressures.

- Advanced information management tools that build on the IT infrastructure to capture knowledge as it is generated and to facilitate knowledge transfer to new staff.

- Innovative business approaches to maintain and develop expertise.

Human Resources, Education and Training, and Public Information

- innovative international strategies for human resources development in the nuclear industry.

- For example, networks are evolving to facilitate learning and knowledge sharing, resulting in mutual recognition of degrees & qualifications, long distance learning and e-learning for both students and professionals. The role of youth internship programs and other approaches to encouraging students to follow nuclear related careers.

- Public understanding and acceptance of nuclear science and technology will improve with broader dissemination of technical information. Explore the role of schools in shaping people's attitudes toward nuclear technology.

Annex 3: Additional recommendations

Invited keynotes opening session

- Select speakers who will introduce each one of the proposed session.
- Select one speaker who will present the essence of knowledge management.
- Select one speaker who will present the peculiarities of nuclear knowledge management.

National and international needs and benefits of NKM

- Securing the knowledge base in a country and international organisations both governmental and private.
- Regulatory aspects are included in Session 2.
- Role of international organisations is included in several sessions.

Corporate needs and benefits of NKM

- NKM as corporate approach in energy utilities is included in different sessions, including policy and strategy.
- NKM for efficient daily operation of nuclear installations is considered in Session 3.
- NKM for specific nuclear projects is considered in Session 3.

Side lectures

- Side lectures are in general discouraged.
- Lecture on KM regarding security of installations should be contemplated as side lecture, keynote address or invited lecture in Session 2.

Panel discussion: NKM for innovation

- After each of the 6 sessions there should be limited Panel discussion.
- There could be Panel discussion especially dedicated to analyse KM in regulation and in regulatory activities.
- It seems convenient to consider a Panel discussion dedicated to the Young Generation.

Closing Panel

- There should be Summaries of all sessions.
- The rapporteurs should be selected among persons with wide knowledge of the subject and advise to summarise the sessions within their respective points of view, without repeating what has been already discussed in the sessions.
- The chairperson of the Conference will present summary of the conference stressing those points which should be developed further.