



DEPARTMENT OF NUCLEAR ENERGY

THE ABDUS SALAM INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

L1-TM-27258

INFORMATION SHEET

**Workshop
on
Managing Nuclear Knowledge**

**22- 26 August 2005
Trieste, Italy**

**Department of Nuclear Energy
International Centre for Theoretical Physics**

Information Sheet

<u>TITLE</u>	Managing Nuclear Knowledge
<u>PLACE</u>	Trieste, Italy
<u>DATE</u>	22-26 August 2005
<u>ORGANISERS</u>	IAEA in co-operation with the Abdus Salam International Centre for Theoretical Physics
<u>DEADLINE FOR NOMINATIONS</u>	01 June 2005
<u>PARTICIPATION</u>	The meeting is open to 30 participants.
<u>LANGUAGE</u>	The meeting will be held in English.
<u>PURPOSE OF THE MEETING</u>	To provide a forum for exchanging experiences and information on implementation of Nuclear Knowledge Management (NKM), present the lessons learned and accumulate national experiences and good practices in the subject area. The focus will be on common difficulties, possible solutions and good practices with the aim of making results directly applicable to the nuclear sector workplace.
<u>PARTICIPANTS</u>	Technical managers and technical specialists of nuclear utilities, academia, nuclear regulatory bodies and technical organizations who are in charge of managing nuclear knowledge in any form, either as data, as human resources or as institutional knowledge.
<u>QUALIFICATION</u>	Participants will be from a wide spectrum of the nuclear sector, and include technical managers and specialists in NKM. In particular, the workshop is useful for the technical and management personnel in charge of knowledge identification, knowledge acquisition and development, knowledge dissemination and use, and knowledge preservation. A selection of participants will be done based on their qualification and experience related to NKM and their contribution to the workshop programme (Please refer to the Participation Form).
<u>NATURE OF THE MEETING</u>	The meeting will cover methodological and design practices for NKM including the information technology impact on NKM implementation, present the lessons learned and accumulate national experiences and good practices from NKM programs in academia, industry, the governmental sector and technical

support organisations. It is intended that, to the extent possible, experiences will be shared from several Member States/organizations.

The style of the meeting will be a series of leading presentations followed by working sessions discussing the issues raised and difficulties envisaged. ***All chosen participants will be expected to be actively involved in discussions, panel reviews and workshop activities. During special sessions participants will present case studies and examples from their national activities/projects.***

The emphasis will be on the following issues:

- Knowledge Management as part of Integrated Management System
- Policies and Strategies in Nuclear Knowledge Management
 - *Knowledge Management Dimensions*
 - *Creating Successful Knowledge Strategies*
 - *Knowledge Management Processes*
- Managing and Preserving Nuclear Knowledge
 - *Capturing and Preserving Existing Knowledge*
 - *Knowledge Preservation Technologies*
 - *Developing “knowledge packages”*
 - *Maintaining Research and Development capabilities*
- Managing Nuclear Information
 - *Collection and Dissemination of scientific information and the transfer of technology*
 - *IT techniques*
 - *Knowledge bases*
- Human Resources for the Nuclear Sector
 - *Maintaining Competency*
 - *Development of future nuclear workers*
- Networking for Education, Training and Knowledge Transfer
 - *Knowledge Portals*
 - *Educational Initiatives*

Experts from organizations with recognized KNM programmes will provide the leading presentations and work in break out sessions. It is expected that all sessions will be as interactive as possible.

The Agency does not plan to publish any official proceedings of this workshop. Rather, each participant will make an individual decision as to how his/her materials are shared with other participants, make new contacts and discuss sharing opportunities. Copies of lecture material and workshop output will be provided to each participant.

PARTICIPATION:

All persons wishing to participate in the workshop are requested to complete a Participation Form (see attached) and return it as soon as possible to the competent official authority (Ministry of Foreign Affairs or National Atomic Energy Authority) for subsequent transmission to the IAEA. The nominations should reach the IAEA not later than **01 June 2005**. Official correspondence with regard to the meeting should be addressed to Mr. A. Kossilov, INIS and Nuclear Knowledge Management Section, Department of Nuclear Energy, Scientific Secretary of the meeting.

More information (the time schedules of the workshop and details on local arrangements in Italy) will be provided once participants have been chosen.

ORGANIZATION:

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BACKGROUND INFORMATION

Over a very short period, the IAEA has underscored the importance of the Nuclear Knowledge Management issue, as demonstrated by various initiatives and activities undertaken during last 3 years. Within its activities, the Agency has elevated nuclear knowledge management with Member States to a central position and has launched or supported a number of important global initiatives in response to their requests. The further involvement of Knowledge Management in the programmatic activities is essential to the benefit of Member States.

Policies and Strategies in Nuclear Knowledge Management

Knowledge is the key resource of most organizations in today's world. To manage it effectively requires the concept of organizational knowledge rather than simply knowledge that centered in individuals. This needs to be addressed through the concept of an organizational core competency that has proven itself within many organizations in Member States. The knowledge management process normally includes knowledge identification, knowledge acquisition and development, knowledge dissemination and use, and knowledge preservation. Organizations need to manage their pool of corporate knowledge as a strategic resource and not as a mere planning input that only receives attention towards the end of the project implementation phase. In many Member States organizations are taking the concept of "managing knowledge within an organization as a strategic core competency that must ensure greater competitiveness than your rivals in this globalised economy". Many world-renowned organizations have proven their long-term competitiveness and sustainability through actively managing their core competencies as a strategic resource and much can be learned from their experience as the elements of knowledge management remain essentially the same in different countries and different organizations.

A need to manage knowledge is based on some specific business factors, including:

- Marketplaces are increasingly competitive and the rate of innovation is rising.
- Reductions in staffing create a need to replace informal knowledge with formal methods.
- Competitive pressures reduce the size of the work force that holds valuable business knowledge.
- The amount of time available to experience and acquire knowledge has diminished.
- Early retirements and increasing mobility of the work force lead to loss of knowledge.
- Changes in strategic direction may result in the loss of knowledge in a specific area.
- Most of our work is information based.
- Organizations compete on the basis of knowledge.
- Products and services are increasingly complex, endowing them with a significant information component.
- The need for life-long learning is an inescapable reality.

In brief, knowledge and information have become the medium in which business problems occur. As a result, managing knowledge represents the **primary** opportunity for achieving substantial savings, significant improvements in human performance, and competitive advantage.

Managing and Preserving Nuclear Knowledge

Knowledge or expertise associated with technological project is generally made up from two main components and each needs to be managed differently as a strategic resource – it is *technical information or data* and *tacit knowledge or specialist skill*. The first component is usually the easier one to manage through capturing the transfer of information in electronic or hard copy manuals, databases, project design documents, maintenance manuals, project variation order etc. This need to be addressed, however, also as an upfront project requirement during the design phase and should not be added on later as almost an afterthought. It is the second area of so-called *tacit knowledge* that is the more difficult one to manage and which primarily makes up the core competence within an organisation. Where tacit learning has not been incorporated into organisational learning process, so called organisational memory loss has often been the reason for a project's failure. Organisational memory makes up an organisation's culture, its management approach, its decision making process, its communication strategies and last, but not least, it defines its operating boundaries that is captured in its job description. It is by nature, therefore, an ill-defined and elusive concept that cannot be captured simply by conventional means. To capture this vital component of organisational continuity is not an easy task, particularly within rapidly changing organisations undergoing the turmoil of downsizing or reengineering processes. New organisational knowledge preservation techniques or tools such as *learning audits* and the establishment of *oral histories* have now been added to the more traditional technique of *exit interviews*.

Knowledge management has changed dramatically as the age of the work force advances. Capturing the tacit knowledge before the loss of key individuals as well as capturing the various repositories that they maintain for personal use will reduce the need for performing this effort again or for locating the documents that have been used. Knowledge management is the combination of records, standards, design and human knowledge capital. Tools to help facilitate that capture are now being used in some organisations in Member States.

Managing Nuclear Information

The aim of the nuclear information management is to get the best value from all the different types of information generated or used within an organisation. That information may be from internal or external sources, structured or unstructured, it may be published or not, useful for short time or long period, its format may be paper or electronic and its significance purely local and administrative or enterprise-wide and strategic. The practice of information management addresses all these issues and more, allowing you to more effectively to exploit organisation information, in whatever forms it exists, in order to meet business needs and objectives. The effective information management can support avoiding the many inefficient ways of using information, such as: information which is collected but not needed, information stored long term after it is needed, useful information which is inaccessible to potential users, information disseminated more widely than necessary, collection of the same basic data by more than one group of people, duplicated storage of the same basic data,

inefficient methods used to collect, analyse, store and retrieve information, vital information which is not identified or not collected. By recognising these problems and taking the appropriate action to correct them, organisations will not only reduce the information handling costs - significant in themselves - but will also add considerable value to all the business activities, via: improved quality of information for policy-makers and planners, more effective discharge of operational functions, higher quality of service provided and improved customer relationships, more accurate and more cost-effectively produced management information, reduced expenditure on the collection, communication and storage of unnecessary data, better focussed IT investment.

Human Resources for the Nuclear Sector

Skills, knowledge and expertise within an organisation cannot be quantified and managed as traditional outputs; knowledge is overall people centred and thus requires above all else, the management of people with their associated and often differing aspirations, their need for independence and their need for job satisfaction gained from personal achievement. The key themes now include rapid response, flexible employment structure and development of individualism, but as a result within this new way, employers are becoming increasingly dependent on the skills, flexibility and commitment of people in the organisations. Also a life-long employment in a single company is no longer the norm. In fact, it has been estimated that in the USA today, the average worker will change his employment every five years, meaning typically seven job changes in his lifetime. In the nuclear world, this problem is exacerbated by the slow down or even drastic cutbacks in nuclear technology investment in many countries, leading to a situation where nuclear organisations are not only losing knowledge workers to other nuclear organisations but increasingly even losing them to non-nuclear industries. This was convenient when the nuclear industry was consolidating and wished to reduce staff numbers. Now that it cannot afford any further reduction in existing competences and needs to develop new ones in the areas of decommissioning and clean up, attracting young blood, retaining staff and attracting experts from other sectors in the face of competition from industries perceived as more attractive is proving problematic in many countries.

Recent positive trends in the nuclear power industry include continuing new construction in Asia, a return to new construction in Europe, new plants being seriously discussed in North America, plant life extensions being implemented for many existing plants, improved operational and safety performance of plants overall, and innovative designs being developed through the Gen IV initiative. The success of all of these efforts depends upon having sufficient well-qualified personnel for their implementation.

In 2000 the OECD/NEA in its report concluded that “In most countries there are now fewer comprehensive, high-quality nuclear technology programmers at universities than before. The ability of universities to attract top-quality students to those programmers, meet future staffing requirements of the nuclear industry, and conduct leading-edge research in nuclear topics is becoming seriously compromised. A number of concerns exist: the decreasing number and the dilution of nuclear programmes, the decreasing number of students taking nuclear subjects, the lack of young faculty members to replace ageing and retiring faculty members, ageing research facilities which are being closed and not replaced, the significant fraction of nuclear graduates not entering the nuclear industry.”

Networking Education and Training

A number of international efforts have been initiated to address the need for greater numbers of well qualified and educated nuclear industry recruits. The most recent of these is the World Nuclear University (WNU). The World Nuclear Association (WNA) launched it in September 2003. The WNU founding supporters are the IAEA, NEA/OECD, WANO and WNA, and membership includes 26 organizations worldwide. The mission of the World Nuclear University is to strengthen the international community of people and institutions so as to guide and further develop:

- The safe and increasing use of nuclear power as the one proven technology able to produce clean energy on a large global scale; and
- The many valuable applications of nuclear science and technology that contribute to sustainable agriculture, medicine, nutrition, industrial development, management of fresh water resources and environmental protection.

Through a worldwide network that coordinates supports and draws on the strengths of established institutions of nuclear learning, the WNU will promote academic rigor and high professional ethics in all phases of nuclear activity, from fuel and isotope supply to decommissioning and waste management.

Other recent international initiatives regarding nuclear education and training include the European Union's European Nuclear Engineering Network (ENEN) and its successor the Nuclear European Platform for Training and University Education (NEPTUNO), the Asian Nuclear Safety Network and the Asian Network for Education in Nuclear technology (ANENT).

Most organisations in nuclear sector use information technology (IT) to improve their systems for designing, developing and implementing training programmes and other human resource management functions. Some organisations have implemented or are now implementing integrated human resource management systems for all activities concerning planning, employment, organizing, assessment, training, development, payment, protection of health, and use of human resources in the organisation. Use of IT tools for knowledge management are not yet common in most Member State. E-learning is used by some but not most organisations, and generally in limited ways (e.g., general employee refresher training). Some organizations have integrated computerized operation management systems, including work planning and control, and document management functions. The outputs from these systems are readily available to all personnel through intranets.

International Atomic Energy Agency
Technical Meeting/Workshop on Managing Nuclear Knowledge
22- 26 August 2005
Trieste, Italy

L1-TM-27258

PARTICIPATION FORM (please print)

To be sent to the competent official authority (Ministry of Foreign Affairs or National Atomic Energy Authority) for transmission to: **Mr. Andrei Kossilov, International Atomic Energy Agency, INIS and Nuclear Knowledge Management Section, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria, fax: +43 1 2600 29882.**

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Given Names:	Mr. / Ms.
Title (position):	
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Description of work (relevant to the Workshop content)	
Full address:	
Tel:	Fax:
Telex:	E-mail:
I intend to make a presentation ____ No ____ Yes, with the following title: And enclose a 300 word extended summary.	
Date:	Signature: