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INIS and Nuclear Knowledge Management Section
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Strengthening Cooperation on Nuclear Information and Knowledge Management

Photo: JINR

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Supporting Cooperation Among INIS Members

Photo: GAEC

The IAEA continues to support Member States in building the capacity of their national INIS Centres. The INIS Secretariat and the Department of Technical Cooperation are cooperating with national INIS Centres to support training activities. ***Page 11***

Assisting Member States in Managing Nuclear Knowledge

Photo: TokyoTech

International meetings, such as the Asian Regional Workshop on Managing Nuclear Knowledge in Tokyo, and IAEA cooperative projects with Armenia, Kazakhstan and Lithuania assist Member States in managing and preserving their reservoir of knowledge in the nuclear field. ***Page 13***

Networking in Nuclear Education and Training

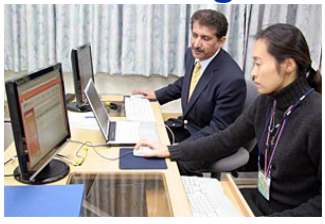

Photo: IAEA

The IAEA continues to support activities such as an annual School of Nuclear Knowledge Management, held in cooperation with the International Centre for Theoretical Physics and the World Nuclear Association. In 2007, the School attracted almost 50 participants from 26 Member States. The Asian Network for Education in Nuclear Technology (ANENT) complements existing nuclear education by an e-training system. ***Page 17***

Strengthening Cooperation with Russian Organizations on Nuclear Information and Knowledge Management

Relations between the IAEA and partner organizations in the Russian Federation were strengthened by a visit of Mr. Robert Workman, Head of the INIS and Nuclear Knowledge Management Section, to Moscow and Dubna in early October 2007. The mission also provided an opportunity for meetings with government officials, representatives of Russian nuclear knowledge and information centres and the National INIS Centre.

INIS-JINR-ICSTI meeting in Dubna, October 2007
Front row from left: Mr. V. Kodola, Director of ICSTI,
Mr. R. Workman, IAEA, and Mr. A. Sissakian, Director of JINR
Second row: representatives from ICSTI and JINR (Photo: ICSTI)

Visiting the Joint Institute for Nuclear Research (JINR) in Dubna near Moscow, Mr. Workman met with Professor Alexei N. Sissakian, Director of JINR, and directors from the International Centre for Scientific and Technical Information (ICSTI), i.e. Dr. Victor Kodola, ICSTI Director, and Dr. Marina Tumanova, ICSTI Deputy Director and INIS Liaison Officer, to discuss cooperation and joint activities.

These were already outlined in a tripartite INIS-JINR-ICSTI framework document that was signed in Vienna in May 2007, and include information exchange and the organisation of events such as training seminars and workshops.

Mr. Workman gave an overview of the current activities of INIS and the IAEA's nuclear knowledge management (NKM) programme and was interested to learn about JINR's international cooperation programmes in nuclear research. A tour of the Institute's nuclear research facilities, including JINR's cyclotrons, concluded the visit.

The Joint Institute for Nuclear Research in Dubna, 'a town of science' near Moscow, is a world-known centre for fundamental nuclear research combined with applied investigations and university education. The International Centre for Scientific and Technical Information, established in 1969 and located in Moscow, provides information, and analytical, consultative and organisational support to international cooperation in science, technologies and business.

Mr. Workman's visit to Moscow included a meeting with Mr. Alexander Filippov from the Ministry of Education and Science of the Russian Federation, and a delegation from TsNIIATOMINFORM, which hosts the National INIS Centre of the Russian Federation.

A seminar at ICSTI for representatives from Russian nuclear knowledge and information centres brought together participants from the Russian Research Centre 'Kurchatov Institute', the Institute of Chemical Technologies and the Moscow Engineering Physics Institute of the State University. In a presentation, Mr. Workman covered ongoing INIS and nuclear knowledge management activities, as well as Nucleus (see p. 20) and a planned 'nuclear web' (NucWeb) of information resources.

Of particular interest to the audience was the idea of developing 'knowledge packages' which offer an educational tool for institutions. Dr. G. Tikhomirov of the State University identified the need for such a tool in his institution. "INIS has kept up with new developments" said Dr. V. Popov of the Kurchatov Institute, and stressed that users appreciate the quality of the INIS Database and the new information products and services.

Contact: Mr. Robert Workman; R.Workman@iaea.org

Mr. R. Workman (left) in discussion with his hosts from ICSTI: Ms. M. Tumanova, Deputy Director and INIS Liaison Officer, Mr. V. Kodola, Director of ICSTI, and Mr. A. Lovtzov, Head of Department and Alternate INIS Liaison Officer (Photo:ICSTI)

Footnotes p. 3 and 4:

[1] Ontario Power Generation (OPG) Darlington and Bruce Power L.P., Canada

[2] Asian Network for Education in Nuclear Technology

[3] Acuerdo Regional de Cooperacion para la Promocion de la Ciencia y Tecnologia Nucleares en America Latina y el Caribe

[4] African Educational Network in Nuclear Science and Technology

The INIS and Nuclear Knowledge Management Section: A Powerful Agent for Change

Mr. Robert Workman joined the IAEA in April 2005 to take up the position of Head of the INIS and Nuclear Knowledge Management Section in the IAEA Department of Nuclear Energy. In this interview, he reviews the past three years at the IAEA and shares his vision for the future of INIS and nuclear knowledge management. He is due to retire at the beginning of April.

Mr. Workman, when you think about the past three years as Head of the INIS and Nuclear Knowledge Management Section, what are the achievements and highlights?

There are two aspects I would like to emphasize: an internal and an external one. Internally, I have managed a Section the size of a Division; so this involves a lot of management work. Actually, this job is 85 to 90 percent management. One of the achievements has been the integration of INIS and Nuclear Knowledge Management into one Section, which is now recognized as such across the IAEA. We have also established strategic links and strong partnerships with related work areas, such as the IAEA Library and the Division of Information Technology, in particular in terms of Nucleus (see p. 20). Another achievement is improved communication: I've initiated monthly communication meetings with all Section staff, which have considerably contributed to the information flow. I have also developed a network — a Community of Practice — on internal knowledge transfer across the Agency.

Photo: T. Kalapurakal, IAEA

Mr. Robert Workman

A highlight for me was the work I have done externally. My visits to Member States during 2007 have provided a clearer perspective on issues affecting Member States, and have enabled me to communicate the work of INIS and nuclear knowledge management; this has proved very useful. Speaking with Member States about knowledge management — that's when it really comes alive. These visits were very strategic, but there was also good technical appreciation. For the Head of a Section like this one, which is really aimed at serving Member States, it should be a key role to travel a lot. We have also improved communication with the Member States through our topical website and this popular newsletter.

You mentioned nuclear knowledge management – what would you consider to be major developments in this area during the past three years?

The major development was building up the Nuclear Knowledge Management (NKM) Unit. When I arrived, there was a programme of work, but few resources, in particular people, to deliver the programme. I believe this is actually one of the major successes of the last three years, building the NKM Unit to a size where it is viable, can deliver its programme and has recruited practitioners in knowledge management with a proven record as project managers.

Personally, I much enjoyed my involvement in the Knowledge Management Assist Visit to Canada[1] in April 2007, which was an example of practical knowledge management. The Assist Visits are one of the best aspects of the NKM programme, where we actually go out and visit Member States. Until now these visits have been predominantly to nuclear power plants, but they will develop to include regulatory bodies, waste management and decommissioning, and will go into other areas of the industry. These visits are well appreciated by the Member States.

Two major activities were the School of Nuclear Knowledge Management, held in cooperation with the World Nuclear Association (WNA) and the International Centre for Theoretical Physics (ICTP) in Trieste, which has now become a successful annual event. We hosted the International Conference on Knowledge Management in Nuclear Facilities last June at the IAEA, on which the NKM Unit needs to build.

Another very important development is the good cooperation established between the Department of Technical Cooperation (TC) and the NKM Unit. We are seeing this coming through in terms of several TC projects. There have always been INIS TC projects, but now we see these projects on knowledge management as well. Taking this one step further, in the future all TC projects should have a clearly identified knowledge component. I know that TC supports this, and I'd like to see it happening quite soon.

How has INIS evolved over the past three years?

When I think about INIS, the first word that comes to my mind is teamwork. I have worked in, and led, many teams during my career. I have to say that the INIS Unit is one of the most integrated, committed and well-motivated. The unit is well-managed and organised, with all members clearly understanding their own roles and key deliverables. They continually produce good results, despite working in an atmosphere of uncertainty about the future, which would destabilise teams that were not built on such strong foundations.

I've tried to shift the focus from just database input by encouraging people to think more about usage, allied to marketing. This is something I brought with me from my previous experience, where I was very focused on the end user, i.e. customer. There have been technological developments; my colleagues at the INIS Unit have been

continuously striving to utilize technology for the benefits of Member States, such as implementing Computer-Assisted Indexing (CAI), and developing the multilingual thesaurus.

Also, in the past few years there has been a real debate on the issue of charging for INIS products and services. I've been very concerned about the charges that are made. They are small, but they do appear to have a negative impact on usage. The recent survey of all INIS Liaison Officers (ILOs) in Member States indicated that it does have a detrimental effect on users in the countries. So we need to deal with this issue very quickly. I am looking at unrestricted access to INIS. We must never again encounter a situation, as I did in one Asian country, where an organisation can simply not afford to use the INIS Database. This is totally unacceptable and goes completely against the spirit of cooperation which is at the core of INIS activities. Incidentally, I was very pleased by the excellent response to the ILO survey which was conducted in 2007 as part of my Five-Point-Plan for INIS.

In your opinion, what are important activities in the coming years? Lets start with INIS.

I have already mentioned the key issue of charging, which is linked to access. Global access is now the priority. INIS should appear prominently on the Internet, where it could justifiably claim to be the No. 1 source of information on nuclear matters. This matter has been discussed interminably over recent years — it is now time that the bureaucratic restrictions are dismantled once and for all.

I definitely see the members of the INIS Unit working more closely with the users of the INIS Database in Member States, implementing the findings of the ILO survey, and also the recommendations we had from very important strategic meetings. The Joint Marketing Plan for INIS, which we have been developing over the past few months, will support these efforts. Also, it is necessary to realise the limitations of some ILOs, in terms of financial and human resources, to carry out their INIS mandate and network with other INIS users in Member States. We need to reach out to support the ILOs and, as necessary, take direct steps to build up a network of content providers in each country.

And for Nuclear Knowledge Management?

We now have many documents covering methodology and guidance in NKM. I would expect to see more practical projects coming from working within the Member States. When I was involved with the World Nuclear University Summer Institute, and also the 2007 Conference on Knowledge Management in Nuclear Facilities, I found that there is a real desire for practical solutions, tools and techniques in relation to managing nuclear knowledge. I think that could be a very strong focus for the next two to three years of our work in NKM.

I would like to see 'knowledge packages' developed which align explicit knowledge with tacit knowledge. This would mean combining explicit knowledge in documents with tacit knowledge which we would 'capture from people's heads'. Of course, the whole methodology could be exported to the Member States in a very practical way.

In terms of the educational part of the NKM programme, ANENT[2] is a flagship educational network. Many resources have been put into it over the past few years. Now I think it is time to look at developing similar networks in other regions, notably in Latin America. There is already a network called ARCAL[3], with which we can work, and also, importantly, in Africa, where a network exists called AFRA-NEST[4]. In Africa there is an insatiable thirst for knowledge about knowledge management. I believe we have great opportunities to work even more closely with TC to develop the right kind of relationships in these regions.

What is your 'vision' for the future of the Section?

I see this Section operating at the forefront of information and knowledge management developments in the nuclear arena. To achieve this goal, the Section needs to 'step up a level' in terms of its key deliverables.

I believe that a web of nuclear information resources, which I call 'NucWeb', should be developed with INIS at the hub. The ILO survey has shown that there is a good response to this concept. We need to bring together other nuclear information resources and utilise a powerful search engine. This project dovetails with an NKM project, 'NuArch' which is harvesting information from the web. These two go hand in hand. I believe that the INIS and Nuclear Knowledge Management Section can be a real agent for change in this respect. They can pull these resources and documents together, and link them in a nuclear web of information and knowledge.

This work would build on Nucleus, the Agency's nuclear knowledge and information portal, which I have been involved in implementing. This has been a reality for a couple of years now. I really see NucWeb being the external version. So we could have the internal version, Nucleus, pushing the nuclear information resources from within the IAEA to the Member States, and NucWeb pulling in the Member States' nuclear information resources for broad use, predominantly by Member States. The achievement of this goal would emphasize the Section working together as one coordinated activity.

The foundation has been laid for further developing the Section as an integrated entity, responsive to the needs of all its stakeholders. I hope that the Member States will continue to play an active role in shaping the IAEA's information and knowledge management programmes. I have made only a start along this road — it will be for others to complete the journey.

Finally I would like to thank my colleagues within the Agency and in the Member States for the support that they have given me during the past three years.

Interview by Ms. Elisabeth Dyck

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News from INIS

Looking Back and Moving Forward

INIS Highlights in 2007

Though not an easy year, 2007 was nevertheless a successful year for INIS. Two regular posts (subject specialist and imaging technician) were moved from the INIS Unit to other Sections in the Department of Nuclear Energy, but still the productivity of the INIS Unit remained at a high level. This was due to our staff's enthusiasm, a reorganisation of the workflow, new tools and close cooperation with the IAEA Library.

In 2007, the comprehensiveness of the INIS Database was further improved by adding a substantial number of bibliographic records, including those of journal articles. We continued to provide cost-free access to the INIS Database and INIS collection of 'grey' non-conventional literature (NCL) to universities and academic institutions in Member States. In close cooperation with Member States, the INIS Unit was also very active in the preservation of nuclear information by digitizing over 2 million pages. Also, the support provided to INIS Member States through IAEA Technical Cooperation projects continued. Several national INIS Centres were established or reactivated, and partnerships with other organizations were enhanced. In cooperation with Member States, the multilingual thesaurus was completed and is now available to INIS Members all official UN languages and German.

Several new activities were undertaken that are very important for national INIS Centres, INIS users and the INIS Secretariat:

- Remote access to the INIS computer-assisted indexing (CAI) system was set up, enabling INIS Centres to use this system when preparing their national input to the database.
- Metadata extracting tools have been developed which, when implemented, will improve the efficiency of input preparation.
- An ongoing study of the usage of the INIS Database aims at improving the quality of information services.
- A survey of INIS Liaison Officers was carried out, and its results will help enhance partnerships with, and support to, national INIS Centres.
- A prototype of a cross-database search interface was developed to provide access to other nuclear information resources through the INIS Database.

Main Directions for 2008-2009

In the coming two years, we plan to extend the above list of activities and continue to implement the recommendations of the 33rd INIS Liaison Officers Meeting and the 11th INIS/ETDE Joint Technical Committee Meeting. In particular, we will:

- Start a pilot project in several Member States, offering cost-free open access to the INIS bibliographic database and non-restricted full-text documents on the Internet, with the aim of providing global free access in 2009;
- Further improve the comprehensiveness of the INIS database;
- Develop a network of nuclear information resources and make it available to Member States;
- Implement new metadata extraction, capturing and indexing tools to be used by INIS inputting centres;
- Further enhance partnerships with Member States and international organisations, in particular with the Energy Technology Data Exchange (ETDE), the Nuclear Energy Agency (NEA) and the International Centre for Scientific and Technical Information (ICSTI);
- Increase support to national INIS Centres based on the results of the ILO survey and through IAEA Technical Cooperation projects;
- Develop a Joint Marketing Plan for INIS products and services, to be implemented jointly by INIS Centres and the INIS Secretariat;
- Improve the visibility of INIS and the quality of information services based on the results of the study on INIS database usage;
- Continue the digitisation of the INIS microfiche collection and create electronic subsets for each national INIS Centre. These data sets will include all full-text documents published in the individual country that are available in the INIS NCL collection.

In the years to come, INIS will remain an important resource for Member States, and will continue to play a very important role in the management and preservation of nuclear information.

Contact: Mr. Anatoli Tolstenkov, A.Tolstenkov@iaea.org

INIS Production Year 2007 Successfully Completed

The successful completion of the production year 2007 brings the total number of bibliographic records in the INIS Database to almost **2.9 million**.

117 440 records were added in 2007, which is the second-best annual result achieved in the history of INIS, and just 5000 records less than in 2006. Over the past years, the annual input of records into the INIS Database has increased constantly, almost doubling the number of annual entries since 1999. Adding bibliographic references to more journal articles and other literature from INIS Member States has further improved the comprehensiveness of the INIS Database, which covers all areas of the IAEA's activities.

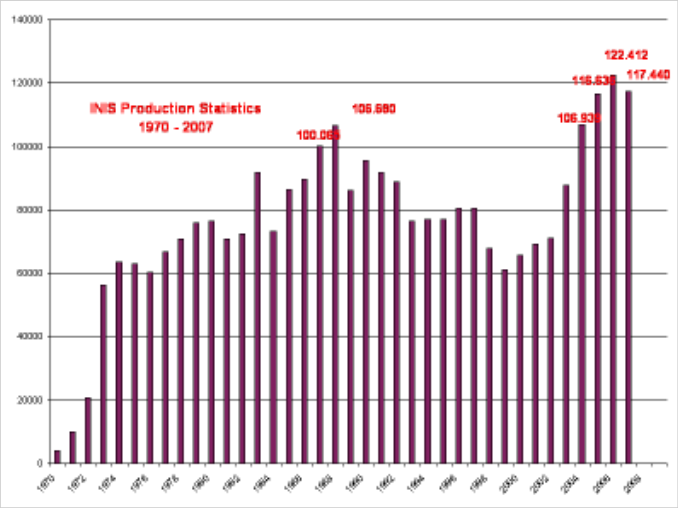

Fig. 1. Records added to the INIS Database between 1970-2007

2007 also brought an eight per cent increase in the number of full-text documents added to the INIS collection of 'grey' non-conventional literature, such as scientific and technical reports, conference proceedings, patents, theses, and preprints. **30 018 documents** were included last year. **226 533 full-text documents** are now available in PDF, and can be downloaded directly from the INIS online database on the Internet.

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2007 Digital Preservation Projects

Digitizing documents and publications from the nuclear field — and thus preserving valuable nuclear information — continues to be one of the major projects of the INIS and Nuclear Knowledge Management Section. The most significant project of the past four years has been converting the INIS collection of 'grey', non-conventional literature (NCL) from microfiche to digital media. More than 600 000 full-text documents are available on microfiche, covering the period 1970–1996. To date, about 40 percent of this microfiche collection has been digitized, and searchable full-text documents in PDF were uploaded to the INIS online database. It is expected that this huge project will be completed within the next three years.

In many Member States, the country's nuclear literature is still available only on microfiche, and individual documents have to be printed out when requested by database users. Hence in 2007, the INIS Secretariat digitized the collections of full-text literature from Argentina, Brazil (partly), Canada, China, Denmark, Germany (partly), India, Poland, Russian Federation (partly), Sweden, Switzerland, Ukraine, and the United States (partly,) and provided DVDs with electronic records (PDFs) to INIS Liaison Officers of the respective countries. Altogether **67 107** reports with a total of **3 047 960** pages were digitized.

Other digitization projects, successfully completed in 2007 include:

- All volumes up to no. 39 of the English language version of the 'IAEA Bulletin'; searchable full-text versions of the Bulletin will be included on the IAEA website.
- Reports of Sweden's AB Atomenergi (Studsvik), which are now available via the INIS Database.
- Establishing a knowledge base on spent fuel storage and management for the RA-type reactor in Serbia (IAEA Service Contract: TCP SCG4003-87004A) by digitizing 1188 documents on design, analysis, construction, operation and decommissioning, and including them, together with 1265 bibliographic records, in the INIS Database.

On the occasion of the 50th anniversary of the Brazilian Commissao Nacional de Energia Nuclear (CNEN), the INIS Secretariat, in cooperation with the national INIS Centre, produced a special DVD to commemorate this event. All publications by Brazilian authors in the INIS Database were selected, digitized, and provided to the Centre for further use.

The IAEA Library keeps a collection of over 50 000 technical reports from Member States, some of them dating back as far as the 1940s. Converting these publications to digital form started in August 2007 in cooperation with Library staff. The project's duration is estimated at 5–10 years, depending on available resources.

In cooperation with other IAEA divisions, several topical CDs with selected bibliographic references and full-text documents from the INIS Database were produced for IAEA conferences and scientific events.

Contact: Ms. Seyda Rieder; S.Rieder@iaea.org;

INIS CDs produced in 2007; these CDs serve as information tools and intend to encourage conference participants to become regular users of the INIS Database

Safe Storage of INIS Full-text Collection

Since 1997, the Central Library of Physics of the University of Vienna has served as a depository library and secure off-site storage place for a back-up copy of the complete collection of INIS non-conventional literature on microfiche. This was made possible through an agreement between the IAEA and the Austrian Federal Ministry of Science and Technology.

Ten years later, in a ceremony on 16 January 2008, members of the INIS Secretariat handed over a small black box to Central Library Head Ms. Brigitte Kromp. It was an external hard disc, which contains the digitized collection of INIS 'grey' literature, including 232 372 PDF documents at a size of 256 GB. "The IAEA much appreciates that the Central Library of Physics remains a reliable partner and offers secure off-site storage of the IAEA Member States's full-text literature on the peaceful uses of nuclear science and technology", said Ms. Seyda Rieder, Leader of the INIS Database Production and Imaging Group. In the (unlikely) event that the INIS collection would be destroyed or damaged, it can be recovered from this safe storage place in the IAEA's host country.

Contact: Ms. Seyda Rieder, S.Rieder@iaea.org

Ms. S. Rieder (third from right) and staff from the INIS Unit present the INIS collection of 'grey' literature to Ms. B. Kromp (second from right), Head of the Central Physics Library of Vienna University. Mr. W. Kerber (fourth from right), former Library Head, joined the ceremony (Photo: R. Kiesewetter)

More on the INIS Database

Free Access to the INIS Database: Number of University Users Growing

At the end of 2007, 356 universities in 64 Member States have complimentary access to the INIS Database on the Internet. Students and teaching staff at these universities now can easily access the database, which is the world's leading information source on the peaceful applications of nuclear science and technology. We encourage universities and academic institutions in INIS Member States to contact us and benefit from this cost-free service.

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Enhancing the INIS Database on CD-ROM: Monthly Updates on FTP Server

A recent enhancement of this product makes the monthly updates available immediately to INIS Liaison Officers via the IAEA FTP server. This has been a major requirement of our subscribers, and the INIS Secretariat is delighted to make it available to its user communities.

Contact: Ms. Taghrid Atieh; T.Atieh@iaea.org

Usage Analysis of the INIS Online Database

The INIS Secretariat has an ongoing project to analyse the usage of the INIS Database on the Internet. The objectives of this study are to gain insights into visitors' behaviour and determine how the database is being used. The findings will allow the INIS Secretariat to introduce any necessary improvements to fulfil users' needs and requirements.

Preliminary results of the analysis were presented at the INIS/ETDE Joint Technical Committee Meeting in November 2007 (see p. 8). Participants welcomed this activity and strongly supported the continuation of the project to learn about the content usage of the INIS Database along with other usage aspects.

Contact: Ms. Taghrid Atieh; T.Atieh@iaea.org

Testing the Metadata Extraction Tool

A key feature of the INIS database is the high quality and consistency of its records. While indexing records was significantly improved by using a computer-assisted indexing (CAI) system, the creation of bibliographic records and abstracts has been a manual process and a bottleneck in the INIS Database production cycle.

MET – the Metadata Extraction Tool – is a software tool that facilitates capturing of data and producing bibliographic records in INIS format, and its use will improve the productivity of INIS staff.

Version 1.0.0 of MET was developed, installed and successfully tested in cooperation with a commercial company, Convera AG. The software tool improves the quality of input and performance by avoiding a manual retyping of data that are already available in digital form, and using selection lists based on central authority files and local personalized lists for recurring entry text. Now phase 2 of the MET project has started and will focus on further improvements and fine-tuning of the software tool.

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INIS/ETDE Joint Technical Committee Takes Important Decisions

Nineteen representatives from 16 countries participated in the 11th INIS/ETDE Joint Technical Committee Meeting, which took place at the IAEA on 6–8 November 2007. The meeting was chaired by Mr. R. Workman, Head of the INIS and Nuclear Knowledge Management Section, and Ms. D. Cutler, ETDE Operating Agent, and was held in a spirit of good cooperation. Its agenda included items important to both ETDE and INIS.

From left: Ms. R. Kunz, Rapporteur, INIS & NKM Section, Mr. R. Workman, Section Head, Ms. D. Cutler, ETDE, Mr. A. Tolstenkov, INIS Unit Head (Photo. T. Kalapurackal, IAEA)

Strategy: Taking into account significant changes in the information world, the meeting covered a wide range of topics related to a strategy for input preparation, new input and capturing tools, access to the CAI system for national inputting centres, maintenance and re-usage of INIS/ETDE products, enhancement of the INIS Database and full-text issues. In addition, preliminary results of the INIS Database usage study and the survey of INIS Liaison Officers (see below) were presented.

Access and charging policy: One of the most important discussion items was the revision of the access and charging policy for the INIS Database. It was agreed and recommended to make the INIS online database available publicly and cost-free, starting in 2008 with as a pilot project for selected countries from various regions. Provided that this trial is successful, it is planned to offer free, open access to INIS bibliographic records and non-restricted NCL full-text documents in 2009.

Communication: The meeting also discussed the importance of further enhancing the INIS/ETDE partnership through improved communication. There is much common interest including authorities, common guide and input rules, technical items, such as full-text handling and access, federated search capabilities, and future joint decisions on information-related developments. To that end, it was agreed to establish joint INIS/ETDE working groups and use the INIS Informal Communication Network (ICN) for communication.

The meeting participants stressed the importance and usefulness of the Joint Technical Committee meetings and recommended to hold such meetings at least every two years.

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Participants in the 11th INIS/ETDE Joint Technical Committee Meeting, IAEA, 6-8 November 2007 (Photo. T. Kalapurackal, IAEA)

A Survey of INIS Liaison Officers

Seventy-five INIS Liaison Officers (ILOs) participated in a major survey that examined the role and activities of ILOs in INIS Member States. The project was carried out between April and November 2007, following a decision at the 2006 INIS Liaison Officers Meeting. The aim was to gain a better understanding of the situation in INIS Member States, identify any issues that may be preventing ILOs from fulfilling their INIS mandate, and determine whether there is a need for additional support from the INIS Secretariat.

Using a questionnaire and personal and telephone interviews, staff of the INIS and NKM Section collected and analysed comprehensive information about the ILOs' positions, financial and human resources in INIS Centres, input to, and usage of, the INIS database, marketing of INIS products and services, and additional information resources available in Member States.

"We had a very good response rate of 65 per cent", said Mr. Workman, Head of the INIS&NKM Section, who led the project. "I want to thank all ILOs who contributed towards making this such a comprehensive survey", he added.

The survey results offer a vast pool of information on individual INIS Member States and on issues of an overarching nature, including the following:

- The comprehensive information provided by the responding ILOs gives a clear picture of the current

situation in the INIS Member States. Each INIS Member is different in its activities and requirements.

- A lack of financial and human resources is an obstacle for some members in fulfilling their INIS mandate. Other issues are a lack of training opportunities and skills in promoting INIS products and services, and language barriers.
- Support from the INIS Secretariat is mainly required in two key areas: input to the INIS Database and NCL collection, and marketing INIS products and services.

"The INIS Secretariat will take appropriate actions in response to the findings, and will report back to the ILOs" said Mr. Workman. The overall goal of this project was to support developing a strategy for the management of INIS in the next three to five years.

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Liaising with INIS Members

Enhancing Relationships with OECD/NEA

On an invitation of the OECD[5]/NEA Databank, Ms. Taghrid Atieh, Leader of the Capacity Building and Liaison Group, visited the Nuclear Energy Agency (NEA) in Paris in early October 2007, where she gave a presentation to NEA staff on INIS and its main products and services. The 20 participants in this meeting engaged in a lively discussion and showed their interest by posing many questions about the INIS non-conventional literature collection, links to full texts, difference among search engines, user preferences, frequency of updates, and the usage and features of the INIS Thesaurus. Ms. Atieh also gave a demonstration of the INIS Database on the Internet. The NEA staff recognized INIS' relevancy to their work, and the importance of strengthening and further developing relationships between INIS and the NEA.

Ms. T. Atieh during her presentation on INIS and its products and services at NEA in Paris (Photo: NEA)

Meetings with Mr. Akira Hasegawa, Head of the NEA Databank, Mr. Juan Galan, NEA ILO, and staff at the NEA Databank covered several approaches to further enhance the NEA Computer Program Service to non-OECD members. During 2007, 726 computer program packages were provided to 32 IAEA Member States that are not OECD members. This clearly demonstrates the need for this service. Agreement was reached on practical ways to cover the gap of NEA literature that so far has not been reported to INIS.

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Visiting the National INIS Centre of France

While in Paris, Ms. Atieh visited the National INIS Centre of France at the Commissariat à l'Energie Atomique (CEA) where she met with Ms. Christa Brulet, ILO of France, Mr. Jérôme Surmount, Alternate ILO, and other staff of the INIS Centre. A training course for staff members from National INIS Centres in Burkina Faso and Niger (see p. 11), which CEA had agreed to host in October 2007, and enhancements of the INIS database, were the main topics of this meeting. Potential future cooperation was discussed with Mr. Victor Hajjar, Chef de Service des Technologies de l' Information.

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INIS / WHO Cooperation

INIS information resources have been made available to staff of the World Health Organization (WHO) at Geneva and in several regional offices, including the International Agency for Research on Cancer (IARC). This was agreed, when Ms. Atieh paid a visit to the WHO in October 2007. The meeting with Messrs. Ian Roberts and Tomas Allen of WHO's Library and Information Networks for Knowledge Unit aimed at reactivating cooperation between INIS and the WHO in terms of contributions to the INIS Database, training WHO staff in the use of INIS information products, and ways to add past and present WHO publications, including full-text documents, into the INIS information resources.

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INIS and ICSTI at London Online 2007

Cooperation with ICSTI continued (see p. 2) when the INIS Secretariat was invited to join the ICSTI information stand at the Online Information Exhibition, held in London in early December 2007 in conjunction with the 2007 Online Information Conference.

Mr. Alexander Nevyjel, Leader of the INIS Content Management Group, attended the event to meet and network with software producers, host systems providers and publishers, and discuss the acquisition of electronic records from journal articles.

"This event is an excellent way to keep track of the latest developments in information and knowledge management systems" said Mr. Nevyjel. "For the success of INIS it is essential to be on the top of global technical developments and offer its users and Member States advanced comprehensive and up-to-date information and knowledge management services", he added.

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[5] Organisation for Economic Co-operation and Development

News from INIS Member States

25 Years with INIS

There is hardly anyone who knows as much about INIS and the role and functioning of an INIS Centre than does Ms. **Christa Brulet**, **the INIS Liaison Officer of France**. When she retires in early summer this year from the Commissariat à l'Energie Atomique (CEA), which hosts the national INIS Centre of France, she can look back on a quarter century of experience with the International Nuclear Information System.

Photo: T. Kalapurackal, IAEA

Ms. Christa Brulet
INIS Liaison Officer of France

At the time that Christa joined the CEA Library in 1983, the information world was much different than now. Her first involvement with INIS was related to information retrieval — preparing bibliographies for CEA researchers. "People had to come to the library, and we did database searches for them. The INIS database was one of our principal information resources and, at that time, we accessed it via ESA or the host server at the IAEA" remembers Ms. Brulet.

The introduction of the INIS Database on CD-ROM in 1991, and on the Internet in 1998, were major technical advances which changed the work of INIS Centres. "The first time I tried out the INIS Database on CD-ROM was actually in Japan, together with colleagues from the Japanese INIS Centre", says Christa. Following a promotion that put her in charge of a group at CEA, which was also tasked with producing the French input to the database, she spent a month at the Japan Atomic Energy Research Institute (JAERI) to learn about information handling and managing an INIS Centre. Having the INIS Database available on CD-ROM, and soon after on CEA's Intranet, resulted in major changes — researchers could perform their own searches, and access to the INIS Database became available 24 hours a day, 7 days a week. It also required starting an extensive training programme for end-users. The downside was that Christa and her colleagues had less personal contact with researchers. "We were no longer as well informed about who accessed the INIS Database and what kind of information users were retrieving", remarks Ms. Brulet.

Making the INIS Database available via the Internet was another major step forward, since it permitted access to the INIS collection of grey literature. "The easy retrieval of full-text documents is really one of the key criteria for users when deciding which information resource to use," says Christa.

Before becoming the INIS Liaison Officer for France in 2000, she worked as Alternate ILO in the 1990s and was already involved in many key activities such as an INIS training course in Saclay, a subject search study and a comparative study of the INIS and the PASCAL databases. Over the years, Christa contributed to many discussions on INIS membership issues and technical improvements. She participated in an INIS evaluation panel in 2002, and a consultancy meeting on strategic input to INIS in 2006, and regularly attended INIS Liaison Officers' meetings.

Cooperation with other INIS Centres also has been high on the French INIS Centre's agenda. "We had quite a few visitors, such as from Burkina Faso, Croatia, Germany, Japan, Morocco, Niger and Romania", explains Christa, and adds that she herself went on expert missions to Egypt and Niger. Training INIS colleagues has been a very good experience: "You learn from them, and I hope they also learn something from us".

Having worked with INIS for many years, Christa knows all the pros (and cons) of the system. She appreciates the INIS Database as a tool for knowledge preservation, and also its functions such as pre-selection of literature in the database, careful subject analysis, which facilitates retrieving references and documents in sophisticated searches, and reliable and lasting access to full-texts of grey literature. She believes that the INIS Database should be a main component of an integrated nuclear information portal which would offer complementary products and services.

"The landscape of scientific communication is changing as more and more information resources are becoming freely available. This will change some of the operation modes for INIS, but I believe that the INIS Secretariat and the INIS Members are prepared for it" concludes Ms. Christa Brulet.

Certainly the INIS community much appreciates Christa's contributions over the years and wishes her an enjoyable retirement time which, as Christa points out, she also will use to pursue her interest in nuclear and renewable energy.

Elisabeth Dyck

Arabic Interface of the INIS Online Database

The national INIS Centre of the Syrian Arab Republic has completed the Arabic version of the user interface of the INIS Database. End-users in the Arabic world can now enjoy searching and retrieving information using an interface in their own language. Special thanks are due to the Alternate INIS Liaison Officer, **Mr. Raed Al-Hallack**, and his colleagues for this valuable contribution. The Arabic interface complements the existing interfaces in English, German, Japanese, Portuguese and Spanish language.

Supporting Cooperation among INIS Members

The IAEA, through the INIS Secretariat, continues to support Member States in building the capacity of their national INIS centres. The INIS Secretariat and the IAEA Department of Technical Cooperation are cooperating with national INIS Centres to support training activities.

The INIS Centre of Belarus hosted two fellows from the **INIS Centre of Uzbekistan**, Ms. Goolchehra Salimova and Ms. Feruza Tashimova, during September 2007. The training programme lasted four weeks, and covered information retrieval and bibliographic and subject aspects of input preparation. It also comprised how to identify relevant national literature for inclusion in INIS information resources, and INIS promotion and outreach. This activity was conducted within the framework of the TC project *Upgrading the National INIS Centre of Uzbekistan*.

The INIS Centre of Syria hosted two fellows: Ms. Mufida Sunni from the **INIS Centre of Libya** (November 2007) and Ms. Nodira Khakimova from the **INIS Centre of Tajikistan** (September 2007). The four-week training programme covered several aspects of information processing, including searching and retrieving information from INIS products and other information resources, and setting up nuclear information services.

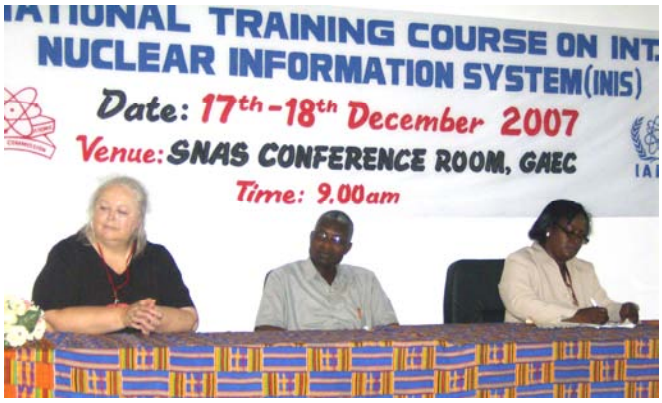
Training Programme at the INIS Centre of India: Within the framework of implementing the TC project *Establishing an International Nuclear Information System Centre*, in November 2007 the national INIS Centre of India organized a four-week training programme for three fellows from the **INIS Centre of Kenya**: Ms. Everlyne Odego, Mr. Henry Njoroge and Mr. Vitalis Omolo Awuor, who is the INIS Liaison Officer of Kenya. The training covered all aspects of INIS operations and activities, the preparation of INIS input, the provision of information services, using INIS CD-ROMs on local networks, and planning and conducting different activities to promote INIS.

INIS Training Course in France: The national INIS Centre of France at the Commissariat à l'Energie Atomique (CEA) in Gif-sur-Yvette hosted a two-week training course in October 2007 for seven staff members of the national INIS Centres of Burkina Faso and Niger.

Participants from Burkina Faso and Niger attended an INIS training course at the National INIS Centre of France in Gif-sur-Yvette (Photo: INIS Centre of France)

This training course, which covered all aspects of INIS operation, usage of products and input preparation, will surely assist in the successful establishment of the national INIS Centres in the two African countries. This course was part of the implementation plans of the current TC projects on *Establishment of the INIS Centre in Niger* and *Establishment of the National Nuclear Information Centre in Burkina Faso*.

INIS National Training Course in Ghana: The INIS Secretariat organised this training course in close cooperation with the IAEA Department of Technical Cooperation and the Ghana Atomic Energy Commission. It was held at the Commission's School of Nuclear and Allied Sciences in Accra on 17–18 December 2007.



Closing Session of the INIS Training Course in Ghana
From left: Ms. M.J.S. Scheepers, ILO of South Africa, Prof. J. H. Amuasi, Coordinator of the Graduate School of Nuclear and Allied Sciences, and Ms. E. Agyeman, ILO of Ghana (Photo: GAEC)

The objectives of this national course were to increase the benefits that Ghana's research and academic communities can derive from INIS, and enhance national participation. The course provided hands-on training on the use of INIS products and services, and information on how INIS information resources support nuclear research activities and education. Over 30 participants attended the course,

including end-users from the Ghana Atomic Energy Commission (GAEC), students from the School of Nuclear and Allied Sciences, other university students and teaching staff, research scientists and staff from the Ministry of Health and institutions with nuclear-related applications, information specialists from all these institutes, as well as staff members of the national INIS Centre.

Ghana's ILO, Ms. E.A. Agyeman, lectured on the role and the services provided by the national INIS Centre of Ghana, while the ILO of South Africa, Ms. M.J.S. Scheepers, trained the participants in the usage of the INIS database. She also lectured on INIS operation and its products and services.

Contact.: Ms. Taghrid Atieh; T.Atieh@iaea.org

Comments from participants:

"I found INIS useful when I was doing my post doctoral studies. As a medical physics lecturer, I still use it. I am glad that INIS is becoming more popular, and that for the first time, an INIS training course was held in Ghana. This should become an annual event."

Prof. J. H. Amuasi, Head, Department of Medical Physics, School of Nuclear and Allied Sciences, University of Ghana

"The course has absolutely served its purpose… I hope all participants will share what they have learned here with colleagues who were unable to attend."

Mr. Henry Cecil Odoi (M.Phil.), Nuclear Engineering Student, School of Nuclear and Allied Sciences, University of Ghana

"The training course is good and should be repeated to train more people. It has improved my skills in information search, and this will help me in my research activities.

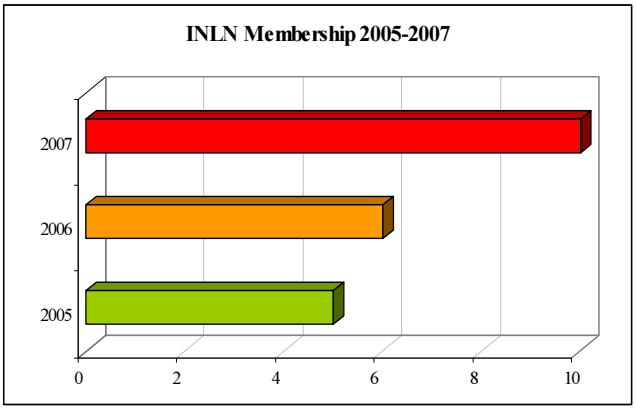
Mr. Stephen Inkoom, Assistant Scientific Officer, Radiation Protection Institute

"The training programme has been a great success…. We have now mastered the art of information retrieval from the INIS Database on CD-ROM and on the Internet. The training has equipped me with new skills in information search that will enhance my research activities.

Mr. Joseph Richmond Fianko, Research Scientist, National Nuclear Research Institute

The Year in Review: International Nuclear Library Network

In the increasingly complex and challenging environment in which nuclear libraries and information centres operate today, cost-effective methods and practices are vital to the efficient supply of up-to-date, reliable and relevant information products and services.



The International Nuclear Library Network (INLN), coordinated by the IAEA Library, provides a low-cost but high-benefit solution for nuclear libraries to enhance their information pool and services available to library clients without generating additional costs to their organizations. Libraries participate in the network pool and share their information bases to provide the best possible services for their clients.

Founded in 2005 by Atomic Energy of Canada Limited (AECL) and the IAEA Library, the INLN had five members in its initial year. In 2006, the Australian Nuclear Science and Technology Organisation (ANSTO) joined the network. In 2007, the INLN welcomed four new members. The China Nuclear Information Centre, the Nigerian Nuclear Regulatory Authority, the Obninsk State Technical University for Nuclear Power Engineering in the Russian Federation, and the Russian Association of Nuclear Science and Education (RANSE) joined the network, thus increasing the membership to ten participants.

The INLN links bibliographic information to full-text and audio-visual information. It also connects librarians, library clients and researchers to the required information. Ultimately, the network brings together nuclear information workers, thus forming a strong community of practice, which can share knowledge, best practices, and lessons learned.

The success of the INLN is based on its democratic structure: all participating libraries are equal partners, valued according to what they contribute as practitioners, information they provide, and how willing they are to share it with other users. There is no predetermined hierarchical or status level. The work of the network focuses on concrete actions, and bringing the *right* information in the *right* format at the *right* time to the *right* place.

Dedicated to continuous innovation, the International Nuclear Library Network provides the framework for turning today's good ideas into tomorrow's successful information products and services.

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News from Nuclear Knowledge Management

Asian Regional Workshop on Managing Nuclear Knowledge

The IAEA Asian Regional Workshop on Managing Nuclear Knowledge, hosted by the Tokyo Institute of Technology on 22 to 26 October 2007, was the first IAEA activity on nuclear knowledge management ever held in Japan.

Around 100 participants from the host country, including representatives of the Ministry of Economy, Trade and Industry (METI) and the Ministry of Education Culture, Sports, Science and Technology (MEXT), 14 IAEA Member States and two international organizations attended the event. In distinguished addresses, Mr. Masuo Aizawa, President of the Tokyo Institute of Technology, and Mr. Shunsuke Kondo, Chairman of the Atomic Energy Commission of Japan, opened the event.

The focus of this important regional meeting was on:

- international initiatives to effectively manage nuclear knowledge,
- policies and strategies to implement nuclear knowledge management,
- NKM's role and contribution in increasing nuclear power generation and developing nuclear-related innovative technology, and
- Asian initiatives for education and training of the next generation of nuclear experts.

A Policy Forum and four sessions — with technical presentations and discussions and lectures by international experts — covered critical areas of nuclear knowledge management, such as national planning, human resources, skills and competencies, industry and regulatory needs and the nuclear safety culture inherent to an effective management of nuclear knowledge. Country reports from the Asian region highlighted national activities in China, India, Indonesia, Malaysia, Pakistan, the Philippines and Sri Lanka.

A video-conference enabled a discussion between workshop participants in Tokyo and experts from the Obninsk State University for Nuclear Power Engineering in the Russian Federation (Photo: TokyoTech)

Since the Tokyo Institute of Technology is a graduate school of nuclear engineering, it was the ideal venue for holding a Student Forum that was also open to the public. Students and postgraduates, who had organized the event, discussed with participants how nuclear knowledge can be best acquired and transferred to the next generation of nuclear experts.

Education and training in nuclear knowledge management were also the topic of a video-conference organized during the meeting between the Tokyo Institute of Technology and Obninsk State University for Nuclear Power Engineering (OINPE) in the Russian Federation.

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Supporting Kazakhstan in Nuclear Knowledge Management

Nuclear knowledge management is regarded as a key element in the sustainable development of nuclear power and non-power nuclear applications in Kazakhstan. With support from a TC project on *Nuclear Knowledge Management and Preservation in Kazakhstan*, the NKM Unit has assisted the Kazakhstan Atomic Energy Committee (KAEC) to develop a national concept for knowledge management and a portal for managing the electronic workflow of the nuclear licensing process.

Developing a National Concept for Knowledge Preservation: The main goal of KAEC's activities is the reliable and economically effective assurance of safety of the peaceful uses of nuclear energy, while protecting the population and environment from possible negative effects of such activities. The IAEA has assisted KAEC in developing a national concept for knowledge management, including knowledge preservation. Based on the requirements of KAEC, two expert missions to Kazakhstan were organized in May 2007 and consultancy meetings with KAEC representatives were held in Vienna in August and December 2007.

International consultants and KAEC representatives met with IAEA nuclear knowledge management experts to discuss a concept for knowledge preservation in Kazakhstan (Photo: IAEA)

The resulting concept — to be approved by KAEC's management — addresses basic information, requirements, risks and economic issues related to knowledge management; purpose and areas of applying the concept; main directions for developing and implementing knowledge management activities in Kazakhstan; organizational and financial requirements for national knowledge management activities; and the role of the government, regulatory body, nuclear industry and nuclear facilities in knowledge management.

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KAEC Moves to New Level of Knowledge Management: At the end of 2007, KAEC completed a milestone in a new approach to nuclear knowledge management. In close collaboration with the IAEA, a methodology was developed for managing the electronic workflow of the nuclear licensing process. It is now ready for implementation.

Moving from a paper-based nuclear licensing process to a fully electronic workflow system presents a major step forward in the way KAEC will work in the future. However, the portfolio of NKM measures that will be developed and implemented under the umbrella of a KAEC portal extends to further important items, such as an e-library of regulatory documents, procedures and guidelines, and the beginnings of a countrywide nuclear knowledge archive.

In the course of several consultations between IAEA experts and KAEC staff, it was agreed to implement the KAEC portal incrementally. As a first step, KAEC will be provided with electronic workflows and tools for the main licensing process and the infrastructure for electronic document management. Other business processes, the migration of stand-alone database-based tools and, ultimately, a comprehensive national approach to nuclear knowledge management, are foreseen for the second and third stages of realizing the KAEC portal.

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Knowledge-Loss Risk Assessment in Lithuania

As a result of an IAEA/WANO[6] expert mission on Nuclear Knowledge Management ('Assist Visit') to Lithuania in March 2007, the Lithuanian Government requested the IAEA's assistance in a comprehensive assessment of the risk of knowledge loss at the Ignalina Nuclear Power Plant (INPP); and support the development of a knowledge management policy and practical approaches to nuclear knowledge preservation, including transferring accumulated knowledge crucial for a new build.

In January 2008, IAEA experts met with the INPP management and representatives of the Lithuanian regulatory body, a major company in the electricity sector in Lithuania ("Lietuvos Energija"), and the Ministry of Economy in Vilnius. As a result, the IAEA knowledge management team will train the INPP project team assigned to perform the assessment. Lithuania also requested IAEA assistance in an assessment of human resourses and critical knowledge needed for all phases in developing a new nuclear power plant.

Lithuania emphasized that knowledge management issues faced by the industry require long-term vision, a common understanding, and coordinated strategic actions by all players in the industry. The IAEA assistance is expected to make an essential contribution to facilitating cooperation, and ensuring awareness and understanding at the government level.

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Preserving Nuclear Experience in Armenia

The IAEA is assisting Armenia in preserving nuclear experience and competences required for the effective and safe use of nuclear energy. Supported by a TC project, a feasibility study of nuclear energy development in Armenia focuses on issues of human resource development and competence building. This is particularly important in view of Armenia's plans to potentially build new nuclear power plants.

A team of experts met at the IAEA in July and October 2007 and went on an expert mission to Yerevan in November 2007. To date, the team and IAEA staff have defined tasks, activities, functions, competencies, and human resources needed in Armenia for the deployment of new nuclear power units; collected data and information from stakeholders on the current status of human resource development in the country; began to analyse data gathered and define preliminary findings; and identified future project activities, such as setting benchmarks for staffing and options for plant selection. A workshop is planned in Yerevan in 2008 to facilitate sharing best practices of Member States which recently expanded their nuclear programmes. The Armenian feasibility study will be concluded at the end of 2008.

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Developing Guidance Documents

Managing Knowledge in Nuclear R&D Organizations

Experts from national and international research organizations in 13 Member States met at the IAEA's Headquarters in Vienna on 19–23 November 2007 to discuss knowledge management for nuclear research and development (NR&D) organizations, and present effective knowledge management activities in NR&D in their countries. Since the IAEA was requested to provide prac-

[6] World Association of Nuclear Operators

tical guidance specific to this sector, the key objective of this technical meeting was to develop a guidance document for stakeholders in NR&D in Member States.

Knowledge management in nuclear research and development has some distinctive features which will be addressed in the guidance publication. R&D is a process of utilizing available knowledge to create new knowledge, or new products and processes. The key strategic goal, however, is not only to create such knowledge and deploy it in products and processes, but also to create state-of-the-art knowledge. "The product of nuclear research and development is, generally speaking, 'knowledge', and it addresses key demands and societal responsibilities" said Ms. Marie-Laure Ruyssen, who heads the IAEA's Knowledge Maintenance Group and served as Scientific Secretary of the technical meeting.

Nuclear R&D combines long-term basic research and short-term applied research. Close collaboration with industry, academic institutions and other R&D centres is essential, as is the need to preserve this knowledge. Since its creation was publicly funded, public money should not be invested again to recreate such knowledge. That is why managing nuclear knowledge is so important. Governments are often the major stakeholders in this area.

Technical Meeting on Knowledge Management for Nuclear R&D Organizations, IAEA, November 2007 (Photo: T. Kalapurackal, IAEA)

The experts at the meeting emphasized that executives should take responsibility for initiating knowledge management. Senior management should be aware that there are risks, benefits and obligations involved, and that there are consequences if knowledge is not managed effectively. Also, there should be a strategic alignment between an organization's overall strategy and the objectives of knowledge management. Thus the publication will also discuss practical methods of how to develop and implement a knowledge management strategy in the NR&D sector. The three elements in an implementation methodology are **people, processes and tools**.

The new guidance document is intended for senior managers and executives in R&D organizations in the nuclear sector who are responsible for developing and maintaining nuclear knowledge and competencies of the workers in their organizations. The document will be published in mid-2008.

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Knowledge Preservation

Nuclear Knowledge – How to Preserve it?

A group of experts assembled at the IAEA in mid-October 2007 to discuss methods and tools for preserving nuclear knowledge effectively. The meeting brought together representatives from eight participating organizations for their second meeting within the framework of an IAEA Coordinated Research Programme (CRP) on the *Comparative Analysis of Methods and Tools for Knowledge Preservation*.

The strategic importance of preserving existing nuclear knowledge and expertise, and thus preventing the loss of vital technical and historical information, is increasingly recognized by nuclear power plants and other organizations in the nuclear field. That is why the IAEA initiated a coordinated research project on knowledge preservation, which is now in its second year. The project aims at assisting Member States in selecting and implementing cost-effective solutions for knowledge preservation, and facilitating awareness of new methods and good practices to preserve knowledge that is critical to the nuclear sector. This requires different ways to capture, transfer and manage information and knowledge, using tools such as databases, expert systems, multimedia, intranets, portals and others.

Chaired by Mr. John de Grosbois of Atomic Energy of Canada Ltd. (AECL), the meeting focused on the current status of research projects in the participating organizations. The experts also defined the term 'Knowledge Preservation' to ensure a common understanding among all CRP participants:

> ***"Knowledge preservation includes those processes to capture, understand, archive, retrieve and protect explicit and tacit knowledge, and maintain accessibility and readability to it as technology evolves, for as long as the knowledge remains useful."***

Mr. John de Grosbois of AECL chaired the Meeting on Comparative Analysis of Methods and Tools for Knowledge Preservation, IAEA, 15-19 October 2007 (Photo: T. Kalapurackal, IAEA)

Three perspectives of knowledge preservation, and a number of commonly associated processes, were identified:

1. **Archival perspective of knowledge preservation,** such as is done by libraries and records management services in many organizations;

2. **Business Process Re-engineering (BPR) and Transaction Theory perspective**, which relies mainly on various online-based information systems to integrate processes and support institutional memory;

3. **Perspective of human resource and organizational learning** to ensure that human resource capabilities and core competencies are sustained, e.g. through formal training programmes, tacit knowledge retention and knowledge transfer.

Related to the archival perspective, during the meeting, experts from the INIS Unit presented their significant project on digital preservation (see p. 6), which converts literature of Member States from microfiche to digital media so that it can be accessed electronically from the INIS Database.

Seven IAEA Member States and one international organization are undertaking research within the framework of this CRP, which will be concluded in September 2009.

- Bulgaria (Technical University of Sofia)
- Canada (Chalk River Laboratories, AECL)
- Jordan (Water Authority of Jordan)
- Pakistan (Pakistan Nuclear Regulatory Authority)
- The Philippines (Philippine Nuclear Research Institute)
- Romania (Institute for Nuclear Research)
- Russian Federation (Inter DCM. Corp., a Subsidiary of the "Kurchatov Institute")
- European Commission (Institute of Energy, DG Joint Research).

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The Role of Universities in Preserving and Managing Nuclear Knowledge

Experts from Member States and the World Nuclear Association met at the IAEA on 10–14 December 2007 to discuss the role of universities in preserving and managing nuclear knowledge. The Technical Meeting focussed on academic aspects of the World Nuclear University (WNU) and academic nuclear education in Member States, and a planned IAEA publication on this subject.

The participants discussed and developed recommendations on academic affairs of the WNU. It was agreed to establish two working groups on the development of a *global nuclear course directory* and on a *scholarship endowment*. Presentations on the status of nuclear education in Member States yielded a very good overall picture. The role of the IAEA was emphasized as a global forum to address the status, future needs and expectations for nuclear education, global demands for well qualified human resources, and the need to address nuclear education in anticipation of future nuclear growth.

The Technical Meeting also developed an extended outline of an IAEA publication on the *Status of, and Good Practices in, Nuclear Education*, based on proposals from participants. The outline, together with the material presented during the meeting, are suitable for IAEA to develop a first full draft of the publication in early 2008.

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Participants discussing the Role of Universities in Preserving and Managing Nuclear Knowledge at an IAEA Technical Meeting in December 2007 (Photo: T. Kalapurackal, IAEA)

Fast Reactor Data Retrieval and Knowledge Preservation Initiative

The IAEA is creating a comprehensive international inventory of fast reactor data and knowledge, combining information from different Member States through a web portal to be established and maintained by the IAEA.

Ten participants from six Member States participated in a Technical Meeting, held in Vienna on 11–14 December 2007 as part of a series of meetings convened by the IAEA to implement the Fast Reactor Data Retrieval and Knowledge Preservation (FRKP) initiative. The outcome of this meeting was the definition of requirements for the FRKP Portal and the formulation of recommendations for its implementation. The participants reviewed the status of the FRKP Portal prototype and the availability of collections of fast reactor-related documents to be made accessible via the Portal. They also located new sources for digitized documents to be made accessible through the FRKP Portal and agreed on an action plan for future activities.

The IAEA's continuous support for the FRKP initiative is essential. Resources from INIS and NuArch, a project to harvest information from the web, are crucial, since they provide an existing repository infrastructure. An interface will be developed to ensure the automatic updating of the FRKP system.

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Networking in Nuclear Education and Training

2007 School of Nuclear Knowledge Management

For the fourth time, a School of Nuclear Knowledge Management was held at the Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy, on 24–28 September 2007. The School was organized by the IAEA, in cooperation with ICTP and the World Nuclear Association (WNA).

Participants in the 2007 School of Nuclear Knowledge Management, held at ICTP in Trieste, Italy (Photo: A. Kosilov, IAEA)

This important training event provided 46 participants from 26 countries with an overview and basic understanding of the tools, mechanisms and challenges of nuclear knowledge management. Managing such knowledge requires special skills that can be derived from various disciplines and fields. Thus the programme of the School included lectures, presentations, practical sessions and discussions on:

- policies and strategies in nuclear knowledge management
- human resources and knowledge transfer
- managing nuclear information resources
- nuclear English
- methods and tools for knowledge management including practical examples, and
- networking for education and training.

In a special session on *Comparison of Curricula in Non-power Nuclear Applications and Development of Recommendations for their Improvement*, lecturers and students shared experiences and approaches in non-power nuclear education, in particular in developing educational curricula, identified the basic trends and knowledge management needs to support non-power nuclear countries activities, and provided comments and recommendations to enhance nuclear education and training and define further IAEA activities in this area. The session resulted in a report to the IAEA, including an analysis of basic trends in non-power nuclear education, existing curricula and recommendations.

All participants received a Handbook of Nuclear Knowledge Management, prepared by an IAEA team of international experts. For the first time, at the end of the School, participants had the option to take a test, and upon its successful completion, received a Certificate.

The 2008 School of Nuclear Knowledge Management will take place on 1 to 5 September 2008 at ICTP in Trieste, Italy.

> My impression of the 2007 School of Nuclear Knowledge Management in Trieste is excellent. The quality of the lectures, materials, and the organization was very good. The information I've acquired at the School will be of benefit to my Institute and very useful in our knowledge management activities.
>
> *Ms. Minodora Apostol*
> *Institute for Nuclear Research Pitesti, Romania*

Contact: Mr. Andrey Kosilov, A.Kossilov@iaea.org

ANENT holds Meeting in India

The 4th Annual Meeting of the Asian Network for Education in Nuclear Technology (ANENT) took place in Goa, India, on 19–23 November 2007. The Bhabha Atomic Research Centre (BARC) hosted the event. Since the IAEA TC Department has been supporting ANENT since early 2007, this was also the first meeting of national coordinators for the TC project *Supporting Web-based Nuclear Education and Training for Regional Networking*. Eight new members (Bangladesh, Israel, Lebanon, Myanmar, the Palestinian Authority, Qatar, the Syrian Arab Republic and Yemen) recently joined this activity, increasing the total number of participating countries to 20.

The meeting agenda included recent and new activities, such as developing reference curricula for universities in nuclear engineering and promoting knowledge management practices in nuclear education. ANENT does not offer academic education; it complements existing education mechanisms by a training system available via the ANENT web portal and cyber learning platform. This includes preparing curricula and education materials that will be available to academic institutions and students in the region, including entire audio-video courses, multimedia presentations and literature in the areas of nuclear power engineering, energy planning, radiation protection, nuclear medicine, and non-power applications. Workshops at the IAEA and regional training courses, e.g. in the Philippines in 2008, will support these activities.

A new activity will focus on knowledge management practices in nuclear education. "We will organize so-called 'knowledge management assist visits' to universities and other training organizations", explains Mr. Y. Yanev, who heads the IAEA NKM Unit. "This will assist them to benchmark their programmes and educational practices against the best practices in the world, and help them improve and innovate", Mr. Yanev adds.

From left: Ms. K. Hanamitsu, IAEA, Mr. K.W. Han, KAERI and 2007 ANENT Chair, Mr. Y. Yanev, IAEA, Mr. V. Kumar, BARC, and Mr. R. Puri, BARC and 2008 ANENT Chair (Photo: BARC)

The project will also offer fellowships for nuclear engineers to be trained at the IAEA, the European Nuclear Education Network (ENEN) and the Institute for Advanced Studies at the University of Pavia, Italy, which agreed recently to cooperate with the Asian network.

It is planned to hold the next annual meeting in China in 2008.

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First e-training Course via ANENT Cyber Platform

A cross-departmental collaboration between the NKM Unit and the Planning and Economic Studies Section (PESS) of the Department of Nuclear Energy facilitated the first e-training on energy planning. Held under the auspices of ANENT in November 2007, the web-based distance learning course enabled 35 participants in eight Asian countries (India, Indonesia, Republic of Korea, Malaysia, Pakistan, the Philippines, Sri Lanka, and Thailand) to study the evaluation of external cost of health and environmental impacts of nuclear power and other energy options, using distance learning material developed by PESS. One of the most active ANENT members, the Korea Atomic Energy Research Institute (KAERI), had organized the e-training course and uploaded the course material on ANENT's cyber platform. Participants were able to communicate with tutors and each other via a video-conference and through other ANENT communication channels. At the end of the course, the students submitted their work on case studies that examined the environmental impact of different energy options at a country level.

ANENT is planning to continue the web-based distance learning programme as an important element in nuclear education and training. This e-training course was the first step in that direction and provided valuable experience for further developing the programme.

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Meetings on Atomic Energy: 2007 Statistics

In 2007, information on 1172 conferences, symposia and training courses was added to the *Meetings on Atomic Energy* database, maintained by the NKM Unit. In addition, web access statistics recorded 78 204 hits during 2007.

The on-line edition is updated daily and features the most current information available to the IAEA. A search function allows users to find just the information they may be looking for. A printable version of the previous publication continues to be offered on the website and can be downloaded by users who prefer paper format. Volume 40/1, January 2008, of *Meetings on Atomic Energy* is the latest, printable version and contains 789 records on world-wide conferences and training courses.

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Recent Publications

The World Nuclear University: New Partnership in Nuclear Education

IAEA-WNU, July 2007

This technical document provides an overview of the development of the World Nuclear University and related IAEA activities and contains an analysis and recommendation of the first WNU Summer Institute held in the USA in 2005. The report is intended for a wide range of senior and middle-level managers of the nuclear industry, academia and research sector involved in nuclear education.

Asian Network for Education in Nuclear Technology (ANENT): IAEA Activities and International Coordination

IAEA-ANENT, July 2007

This publication describes the Asian Network for Education in Nuclear Technology (ANENT) including its purposes, activities, and results since its establishment in 2004. The book and attached CD-ROM will help promote a better understanding of ANENT as a unique and meaningful activity which the IAEA is undertaking to address the need for nuclear education and training in Asia.

Web Harvesting for Nuclear Knowledge Preservation

IAEA Nuclear Energy Series, No. NG-T-6.6 (STI/PUB/1314), Vienna, 2008

This publication provides general information and examples based upon experience in Member States on web harvesting in the context of knowledge preservation in the nuclear field, contemporary activities in the domain of web harvesting, document archiving and Internet access technology to obtain a contemporary technology overview. Several aspects of possible web harvesting methodologies are presented in some detail, which can also serve as a basis for establishing future cooperation.

New Members of the Team

Marija Sejmenova-Gichevska
Information Scientist
IAEA Library/INIS Unit

Marija joined the IAEA in September 2007. Working as INIS Subject Specialist for Physics, and Collection Development Librarian for the IAEA Library, Marija holds a truly cross-cutting position. In the INIS Unit, she verifies the quality of Member States' input by performing subject analyses of the contents of IAEA and UN publications and electronic bibliographic input received from scientific publishers, and assists in improving the comprehensiveness of the INIS database in the fields of physics. Marija holds advanced university degrees in mechanical engineering, and library and information science. Previously, she worked for 14 years in the library and information services of the National and University Library of Macedonia. For 11 years she was INIS Liaison Officer for Macedonia.

Zoltan Pasztory, Consultant
Nuclear Knowledge Management Unit

Zoltan Pasztory joined the Knowledge Preservation and Networking Group in February 2008. An expert in nuclear knowledge management, he will be involved in preparing guidance documents, handbooks, an electronic lecture course, Assist Visits to Member States and other knowledge maintenance activities. Zoltan comes from the Paks Nuclear Power Plant in Hungary, where he worked as Head of the Strategic and Organizational Development Section. He holds Master degrees in Electrical Engineering and Nuclear Energy from the Kharkov Technical University in the Ukraine, and in Business Administration from the Budapest University of Technology and Economics.

Wilhelm Mandl, Consultant
Nuclear Knowledge Management Unit

Wilhelm Mandl joined the Knowledge Maintenance Group in February 2008, where he is responsible for implementing activities in the area of maintenance and preservation of knowledge in nuclear science and technology. By training, Wilhelm is a physicist with an additional degree in informatics. He earned his PhD in thermonuclear fusion research, and worked on international research projects in Germany, the UK, the US and in France. Since 1998 he has worked in the area of nuclear knowledge management. He was on the IAEA staff from 1998 until 2005.

2008 Meetings

Meeting Title	Date	Location	Country	Scientific Secretary
Workshop on Managing Knowledge in Nuclear R&D Organizations	5–9 May 2008	Karlsruhe	Germany	M. L. Ruyssen Y. Yanev
Meeting of Senior Officials on Nuclear Knowledge Management: Cooperation for Development	14–16 May 2008	IAEA, Vienna	Austria	Y. Yanev A. Kosilov
Technical Meeting on the Status of Education and Human Recourses Development in the Nuclear Field	17–20 June 2008	IAEA, Vienna	Austria	Y. Yanev A. Kosilov
Workshop on Making Knowledge Work – Nuclear English for University Teachers	June 2008	Kaunas	Lithuania	Y. Yanev A. Kosilov
2008 School of Nuclear Knowledge Management	1–5 September 2008	ICTP, Trieste	Italy	Y. Yanev A. Kosilov
Technical Meeting on the Development of Curricula in Nuclear Science and Technology	3rd quarter 2008	IAEA, Vienna	Austria	Y. Yanev
RCM on Comparative Analysis of Methods and Tools for Nuclear Knowledge Preservation	20–24 October 2008	IAEA, Vienna	Austria	M. L. Ruyssen I. N. Kitaev
34th Consultative Meeting of INIS Liaison Officers	2–5 November 2008	IAEA, Vienna	Austria	A.Tolstenkov
Technical Meeting on National Approaches and Strategies for Nuclear Knowledge Management	November 2008	IAEA, Vienna	Austria	Y. Yanev
Technical Meeting on the Asian Network for Education in Nuclear Technology (ANENT)	4th quarter 2008	TBD	TBD	Y. Yanev K. Hanamitsu

Nucleus – What's In It?

http://nucleus.iaea.org

Nucleus is the IAEA's gateway to technical, scientific and regulatory information resources. Users can browse the Nucleus information catalogue by subject, source and type of data. A main advantage of this catalogue is that it brings together dispersed resources, and users who come for one purpose may find new resources they did not even know existed.

Some of the resources most frequently accessed relate to nuclear power reactors and plants. For example, the Energy, Electricity, and Nuclear Power Reference System (RDS-1) collects energy, electricity and nuclear power estimates for the period up to 2030. The Fast Reactor Database (FRDB) contains design and operational data on experimental, prototype, demonstration, and commercial-size Liquid Metal Cooled Fast Reactors. The focus is on practical issues that are useful to engineers, scientists, managers, university students and professors. Within the Power Reactor Information System (PRIS) the IAEA has been collecting operating information from nuclear power plants in Member States since the late 1960s. The IAEA's Research Reactor Database (RRDB) contains administrative, technical and utilization information on over 670 non-power reactors.

Another collection of resources pertains to environmental sciences using nuclear technology. The Global Network of Isotopes in Precipitation (GNIP) is an interesting tool for climatologic, atmospheric and hydrological studies. The Isotope Hydrology Information System (ISOHIS) database allows the gathering, storage and dissemination of isotope, chemical, hydro-geological and geographical data of water studies around the world. The IAEA's Marine Information System (MARIS) is based on a geographical information system (GIS) and covers the distribution of radioactive and stable isotopes, and, in the near future, also other tracers, such as organic compounds and trace metals in the marine environment.

More than 30 resources in Nucleus refer to nuclear physics and radiation physics. The Evaluated Nuclear Structure Data File (ENSDF) database, for example contains evaluated nuclear structure and decay information for over 2900 nuclides. The Experimental Unevaluated Nuclear Data List (XUNDL) contains experimental data compiled from over 1700 recent nuclear structure papers.

Other resources in Nucleus relate to applied life sciences, atomic and molecular physics, engineering, isotopes and radiation sources, management of radioactive wastes, and non-radioactive wastes from nuclear facilities, the nuclear fuel cycle and fuel materials. As more information resources are being added, and the portal itself becomes better known, we expect Nucleus to become 'the destination of choice' for scientists and experts in the nuclear field.

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