



**A newsletter of the Division of Nuclear Power
Vol. 2, No. 1, March 2005**

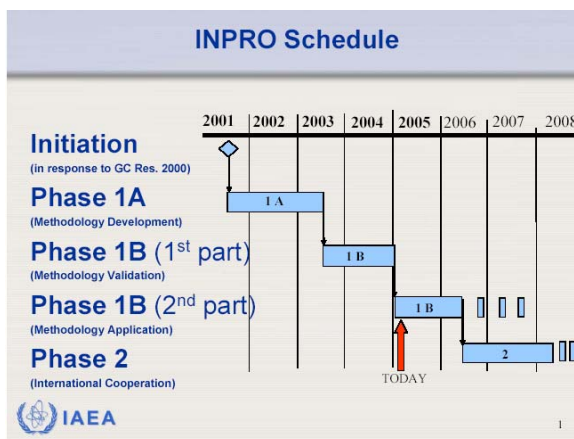
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Division of Nuclear Power
Department of Nuclear Energy
IAEA
P.O. Box 100
A-1400 Vienna, Austria
Tel : +43 1 2600 22751
Fax: +43 1 2600 29598

The 7th meeting of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) Steering Committee



The 7th meeting of the INPRO Steering Committee, convened in December 2004, has approved the objectives and activities for the second part of INPRO Phase-IB and for INPRO Phase-II as suggested by the meeting of an ad hoc group of representatives of INPRO members in October 2004 and by the IAEA/INPRO secretariat. In line with them, the second part of INPRO Phase-IB is to:

- Facilitate assessments of INS by MS (nationally or jointly) using the updated INPRO methodology as stated in the IAEA General Conference Resolution GC(48)/RES/13(F), which invites all Member States to perform “innovative nuclear energy systems assessments”;
- Perform continuous improvement of the methodology with a focus on a more quantitative approach;
- Finalize and publish a *Users' Manual*, and identify and, possibly, develop the essential models, codes and techniques;
- Identify possible frameworks and implementation options for collaborative R&D for INS development, which could be performed during Phase 2;
- Enhance collaboration, on a complementary and synergetic basis, with other national and international INS initiatives (e.g. GIF);
- Determine national, regional and global balances of demands and resources and of infrastructure needs, and establish a databank and further develop codes (e.g. DE-SAE);
- Define and model INS deployment scenarios taking into account strategies considered by MS;
- Review technological and infrastructure options of Multilateral Nuclear Fuel Cycles (MNFC) as consideration for deploying INSs;
- Enhance communication among INPRO members by regular updating the website and publishing electronic newsletters; and,

- Harmonization of regulatory and industrial codes and standards.

During the 7th meeting of the INPRO Steering Committee, several assessment studies to be performed within frame of the second part of INPRO Phase-1B were announced by Member States:

- (1) Joint assessment of INSs based on closed fuel cycle with fast reactors (Russia, France, China, India, Republic of Korea, and Japan as an observer)
- (2) India's assessment of hydrogen generating INS as a component of its national energy mix (possible participation of other MS to be confirmed)
- (3) France's study on the transition from LWRs to Gen IV fast neutron systems (possible participation of other MS to be confirmed)
- (4) Argentina's assessment of the introduction of a block of 700 MWe of nuclear electricity power production based on either the Canadian ACR 700 reac-

tor or the Argentinean CAREM (with Canada, possible participation of other MS to be confirmed)

- (5) Armenia's assessment of INS for a country with small grids (possible participation of other MS to be confirmed)
- (6) The Republic of Korea's assessment on the whole fuel cycle of DUPIC in the area of proliferation resistance (possible participation of other MS to be confirmed)

Other Member States are invited to perform assessments of INSs of their choice using the updated INPRO methodology.

INPRO Phase-II, that is projected to start in mid 2006, will focus on R&D oriented activities, institutional and infrastructure oriented activities, and on the activities for further development of the INPRO methodology. Contact: A.Omoto@iaea.org, V.Kuznetsov@iaea.org, or M.Moriwaki@iaea.org.

Message from the Director



Welcome to our first newsletter for 2005.

This Quarter has led to a major change in the management of the Division, with the retirement of Juergen Kupitz. Juergen has been with the Agency for 25 years, and

for the last 15 has been Section Head of Nuclear Power Technology Development Section. It is impossible to summarise all of his achievements over that period, but they range from the analysis of the Chernobyl accident, to the development of the INPRO project. Juergen's experience will be missed within the Division and on behalf of the NENP I thank him for his distinguished achievements and wish him well in the future. For his excellent work for INPRO in a team with other members of the Agency, he and his colleagues received a team award from the Agency at the end of 2004.

At the end of 2004, at the mid term of the 2004-5 Regular Budget biennium, in most cases the planned activities have been carried out as planned, and where changes were made, these involved either achieving the same objectives through other means, or if necessary delaying the activities until a later date. The planning of the programme for 2006-7 biennium has been a significant activity, with the two major changes; the clarification of the position of INPRO as a separate sub-programme and creation of a sub-programme for non-electric applications including desalination, hydrogen and others.

It remains a continuing role of the Division to help Member States (MSs) in the use of nuclear energy and the development of nuclear technologies where appropriate. To this end we remain committed to the widest pos-

sible dissemination of our documents and material, and to support all countries that are considering the development and application of nuclear power for electricity production, desalination systems, or combinations of power and process heat.

Nuclear Power Division provides assistance to MSs through a continued involvement in Technical Cooperation projects. We will provide information to any MS that is eligible to receive TC support of how the Division can provide support. This support can be given at all stages of the nuclear power plant life cycle, from concept, through design, construction, commissioning, operation, and license renewal to closure, dismantling and decommissioning. For MSs investigating the possible introduction of nuclear power, we would be very supportive of requests, together with other Divisions and Sections especially with PESS (Planning and Economic Study Section) to provide assistance and guidance on the steps needed to be taken by a country to obtain the benefits of nuclear energy. At the start of this new TC programme 2005-6, replacing Ian Facer, the Division has appointed a new TC Liaison Officer, Huiping Cheng, who has considerable experience of working with TC Department on National and Regional projects. I would like to thank Ian Facer for his excellent works for TC projects as liaison officer.

I thank the many people who read the Newsletter and have provided us with comments. It seems that it has been well received. I would like to encourage all readers to send suggestions on how Nuclear Power Division can improve its performance and service to MSs. This will help us, both with our reviews of our own performance, and in planning for the future. A.Omoto@iaea.org.

Nuclear Power Plant Operating Performance and Life Cycle Management

Continuous Process Improvement of NPP Operation

A technical meeting on **Strategies to optimize O&M costs** was held on 1-3 December in the Agency's premises to review the first draft of a report to be published at the end of the cycle. Ten participants from eight Member States participated in the meeting. A number of suggestions were made to further improve the report and the participants agreed to provide additional contributions, including example of strategies developed and implemented in their countries. Recommendations were provided for further activities related to the subject. Contact: M.Condu@iaea.org.

An expert meeting on **Risk Based/Informed Applications in Maintenance and Outage Management** was held in Balatonfüred, Hungary, on 15-17 November. Fourteen participants from nine Member States attended the meeting. The purpose of the meeting was to discuss risk-based applications in maintenance and outage management, scheduling, and risk estimation, and to exchange information on the status of these applications in the Member States. Risk-based tools can be applied in the optimization of outage schedules and can inform planners on risks associated with the individual tasks in the plan. In addition, risk-based applications in upgrading and licensing instrumentation and control (I&C) systems, as well as, implementation of risk-informed regulations, were also discussed. Contact: O.Glockler@iaea.org.

Integrated NPP Life Cycle Management

A technical meeting on **Strategies and Tools for Predictive Maintenance** was held on 29 Nov. – 2 Dec. 2004; Daya Bay, Shenzhen City, China, to provide a forum for exchanging experiences and information on the strategy and techniques on predictive maintenance and condition monitoring in order to enhance the reliability and competitiveness during NPP life cycle. Around 70 experts from 15 Member States participated in the meeting. The meeting focused on three key issues:

- Predictive maintenance planning strategy, technology, and economic aspects;
- Condition monitoring techniques, procedure and experience;
- Inspection, inspection optimisation and ageing monitoring.

A CD-ROM containing all the TM materials, including the papers, presentations, minutes of breakout sessions, was distributed to each participant. The findings/cases of good practices identified will be used for developing an

IAEA TECDOC on 7-9 Jun. 2005. All the participants gave very positive ratings about the TM. Contact: H.Cheng@iaea.org.

A Technical Meeting to **Develop Guidelines in Deriving Effective Ageing Management methodologies** for Plant Life Management (PLiM) was held on 22-26 Nov. at VIC. The purpose of the meeting was to prepare an extended technical documents on the above topic, to better understand the nuclear power plant life management (PLiM), to investigate the general approach, to define the relation maintenance and PLiM, to collect the good practices and to formulate guidelines for ageing management of critical system, structure and components. Additionally the issues of PLiM were discussed with human, technological, economical and regulatory issues to exchange information and the extended TECDOC was prepared. The next meeting will be held on June 2005 to finalize TECDOC. Contact: K.S.Kang@iaea.org.

Databases to Support NPP

A technical meeting on **International database on costs on plant life/license extension** was held on 29-30 Nov. in Vienna to discuss and agree on the elements of the new database. The participants endorsed the recommendation made at the previous consultants meeting to extend the scope and include all capital costs (after the plant is in commercial operation). The participants reviewed the draft specification for the development of the databases. A number of recommendations were made to improve the structure, the use of the database and to outline the commonalities. Advice was given for further activities related to the subject. Contact: M.Condu@iaea.org.

A **software package of concrete containment of NPPs (NPPCC)** was developed. The objective of creation of the NPPCC is to provide the member states with ageing related information about the concrete containment of all NPPs, including information on the type of ageing degradation encountered, repair methods applied, effectiveness of applied repairs, instrumentation used, maintenance programme and in force codes and standards. The package provides for the possibility to enter data, to display data by subjects in the form of a table and linked information; to filtrate data by criteria designated by the user in the form of Oracle-mechanism - "query by example (QBE)"; to filtrate data by preset subject filters (types of components, units etc.); to search data by key words etc. DBMS Oracle, version 8.x/9.x, is the basis for data storage in the developed software package. To get input data from MSs, input module will be distributed to members of plant life management of Technical Working Group (LM-NPP). Contact: K.S.Kang@iaea.org.

Improving Quality Assurance, Technical Infrastructure and Human Performance

Quality Management System

After the approval of the Draft Safety Standard Safety Requirements: Management Systems (DS338) by the Safety Standard Committee, a consultancy meeting was held in February 2005. The meeting resolved the Safety Standard Committee's comments and created the new draft, draft 7 of the DS338. The major changes were: more emphasis on Knowledge Management, additional requirements on Human Performance. The draft will be submitted to the Member States for their review.

The comments from the Member States will be resolved in a consultancy meeting in July 2005. Contact: P.Vincze@iaea.org.

Strengthening national and regional nuclear power infrastructures

A Consultancy on **the socio-economic and environmental costs of continues operation or early closure of a nuclear power facility** was held on in Vienna. This Consultancy with experts from Canada, UK, Bulgaria and Lithuania developed a draft document that will provide the framework for future meetings and a published document. The draft addressed such issues as employee issues, investment appraisal, replacement energy costs, impact on import and export opportunities, environmental impact of alternative generation, and changes to the market conditions.

A Technical Meeting was held on 22-26 Nov. to **develop guidance on the minimum infrastructure necessary to enable member states to adopt nuclear power**. This meeting was attended by representatives of countries who wish to supply nuclear facilities and countries who are considering adopting nuclear facilities in the future. A total of 11 countries plus agency staff from NE and NS participated. The infrastructure was addressed in relation to Legal framework, Regulatory body requirements, Bilateral, multilateral and international agreements, physical facilities, financial and economic issues, and human resources. It was noted that the infrastructure requirements might vary depending upon the aspirations of the country, but that generally for the minimum application to generate power, the minimum requirements would be largely similar. Contact: R.I.Facer@iaea.org.

Effective Training to Achieve Excellence in Human Performance

ENTRAC (Electronic Nuclear Training Catalogue <http://entrac.iaea.org/>) Phase II was completed in De-

ember. Phase II provides both additional functionality (particularly a powerful search capability) as well as greater capability for posting training related information. A large amount of additional information from past IAEA training activities has been added to ENTRAC. Member States' operating and training organizations are encouraged to place information on ENTRAC too and to update it. Contact: A.Kazenov@iaea.org.

In October, NE, in coordination with NS and TC, conducted the third assist mission to the Paks NPP since the April 2003 fuel cleaning incident there. These missions focus on helping Paks NPP management to implement organizational and management improvements to address identified weaknesses in these areas.

A technical meeting was held on 6-9 Dec. in Vienna to



review a draft technical document describing human performance improvements in organizations outside the nuclear industry that are considered to have potential application for the nuclear industry. This document is expected to be published in 2005.

The first Consultants' Meeting to develop a new IAEA technical document on the subject **Training Practices to Support Decommissioning of Nuclear Facilities** has held at the IAEA from 29 Nov. - 02 Dec. A questionnaire has been sent to the organizations and individuals working in this field. Additionally, the training material in support of the decommissioning activities at the Kozloduy NPP is being developed within a Technical Cooperation Project, and they would be available for use by other Member States, particularly by those countries for which the Russian language materials would be useful. Contact: T.Mazour@iaea.org.

Co-ordination of International Collaboration for the Development of Innovative Nuclear Technology

IAEA's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) has published the report on *Methodology for the assessment of innovative nuclear reactors and fuel cycles: report of Phase 1B (first part)* (IAEA-TECDOC-1434, January 2005). This report updates and revises the INPRO methodology based on results of 14 case studies performed by experts from 7 INPRO Member States. The updated methodology will be used for the assessments of innovative nuclear energy systems (INSSs) by Member States in the second part of INPRO Phase-1B, starting in 2005.

A TECDOC on the "Innovative Fuel Cycle Technologies: Status and Trends" is being prepared. This TECDOC will summarize the status of innovative nuclear fuel cycles and associated nuclear reactor developments and will provide information for Member States INSSs for their assessment within the second part of INPRO Phase-1B. The TECDOC will be submitted for publication in 2005.

As of Feb. 2005, INPRO has the following 22 Members: Argentina, Armenia, Brazil, Bulgaria, Canada, Chile, China, Czech Republic, France, Germany, India, Indonesia, Morocco, Republic of Korea, Pakistan, Russian Fed-

eration, South Africa, Spain, Switzerland, Netherlands, Turkey and the European Commission.

A technical meeting on "**Definition of Plant Safety Design Options to Cope with External Events**" for advanced NPP projects was convened at the Agency on 15-19 November 2004 with participation of 14 experts from 10 Member States. The objective of the meeting was to provide a technical and information background to assist the designers of evolutionary and innovative NPPs in the definition of a consistent strategy regarding plant protection from extreme external events, and to support the preparation of the Report on Design Safety Options to Cope with External Events for Advanced NPPs, which will be published in 2005.

Design descriptions of about 50 innovative small and medium reactors have been prepared by the designers in 12 Member States and submitted to the Agency and a IAEA report on the status of the innovative SMRs will be published later in 2005. A working material in a CD format with many of these design descriptions will be offered upon requests starting from mid-February 2005. Contact: A.Omoto@iaea.org, V.Kuznetsov@iaea.org, or M.Moriwaki@iaea.org.

Technology Developments and Applications for Advanced Reactors

Technology Advances in Water Cooled Reactors for Improvement in Economics and Safety

The following summarizes recent progress and plans for activities conducted within the frame of the Department of Nuclear Energy's TWGs on Advanced Technologies for LWRs and HWRs.

The Workshop on **NPP Simulators for Education** was convened at ICTP, Trieste, Italy from 8-19 Nov. 2004. Participants, who were university professors and engineers involved in teaching topics in nuclear energy, were given the NPP Simulators and the associated training in order to use these for education. The simulators operate on personal computers and simulate the performance of a number of reactor types (a BWR, a conventional PWR, a PWR with passive safety systems, a WWER, and a HWR).

The 1st RCM on **Natural Circulation Phenomena, Modelling and Reliability of Passive Safety Systems that Utilize Natural Circulation** was convened at IAEA-HQ, Vienna from 2-5 November. The objectives of the CRP are to facilitate improved understanding of natural circulation phenomena, to identify relevant ex-

perimental databases, to examine the ability of current computer codes and models to predict natural circulation and related phenomena that affect the system reliability, and to develop and apply methodologies for determining the reliability of passive systems. The scope includes natural circulation as a way to remove core power of water-cooled reactors under normal operation (start-up, nominal and shutdown) and accident conditions, and to provide cooling of the containment. Work is conducted through Research Agreements and Research Contracts with institutes from Argentina; Czech Rep.; France; Germany; India; Italy; Japan; the Netherlands; Rep. of Korea; Russia; Spain; Switzerland; USA.

The first RCM provided each participating organization the opportunity to present its research plans and progress, and to discuss the CRP Integrated Research Plan with emphasis on testing and code benchmarking needs. Specific collaborative tasks are:

- Review of the State-of-the-Art in Natural Circulation Phenomena and Modelling;
- Natural Circulation Phenomena Identification and Ranking Tables;
- Natural Circulation Database Assessment and Development;

- Natural Circulation System Code and Model Assessment
- Natural Circulation System Reliability Assessment Methods and Application.

A meeting on **Recent Developments in Evolutionary Reactors (LWRs): Progress in Licensing and Technology** was convened on 8-10 Dec. 2004 in cooperation with the Division of Nuclear Installation Safety. The purposes of the meeting were: (1) to provide information on advances in licensing and technology for on-going evolutionary LWR projects; (2) To provide information for the next cycle of revision of the IAEA Safety Standards (Design Requirements and Guides); and (3) to discuss and summarize the current status, and identify key areas for further examination. Meeting participants included representatives from national regulatory agencies as well as design organizations. A meeting report is in preparation.

In cooperation with the Nuclear Power Engineering Section (NPES lead), a Consultancy meeting on **HWR PLiM and Refurbishment Processes and Technology** was convened on 10-13 Jan. 2005. This activity is preparing a TECDOC addressing:

- Typical processes and methodologies in HWR PLiM programmes, including plant organization considerations, technology infrastructure and supporting data management;
- Advanced technologies and efficient management techniques to improve HWR operation and licensing extension;
- Experience with preventive and predictive fuel channel inspection, and replacement of pressure tubes of HWRs;
- Planning for plant licensing extension / refurbishment;
- Advanced tools for operating and maintaining HWR and mitigating ageing effects;
- Collection of the good practices and formulation of guidelines for ageing management of critical systems, structures and components.

It is planned to complete the TECDOC by the end of 2005. Contact: J.Cleveland@iaea.org.

In cooperation with NSNI, a Consultancy Meeting on **Nuclear Power Plant Designs and Associated Cost Aspects** was held at the IAEA on 27-28 Jan. 2005. The aim of this common initiative is to provide an international forum for discussions on nuclear safety standards and requirements and their implications on the competitiveness of nuclear power in a deregulated electricity market. In this context, potential plant simplifications through an increased use of passive systems and inherent safety characteristics are addressed and risk-informed regulation aspects are taken into account. In a first step, experts from Germany, Italy, Japan, Russia and the USA will perform cost analyses (in relative units) for safety systems and components in existing LWR designs. Contact: B.J.Kuczera@iaea.org.

Technology Advances in Fast Reactors and Accelerator Driven Systems (ADS)

The Project is collaborating with OECD/NEA in their **Information Exchange Meetings on Actinide and Fission Product Partitioning and Transmutation (IEM on P&T)**, to ensure that maximum synergies are attained between the activities of the two international organizations. Within this framework, we participated in the 8th IEM on P&T, and presented a paper entitled *IAEA Activities in the Area of Partitioning and Transmutation*.

The Technical Meeting on **Utilization of MONJU for International Cooperation in Fast Reactor R&D**, hosted by the Japan Nuclear Fuel Cycle Development Institute (JNC) in Tsuruga, Japan, provided a global forum for information exchange on the status of MONJU and its potential for international collaboration in fast reactor R&D. Participants from seven Member States and two international organizations reviewed the current status of MONJU, the planned start-up program, and discussed the needs of the international fast reactor R&D community with regard to MONJU start-up, operation, and technology development programs. A number of concrete proposals for IAEA Coordinated Research Projects (CRPs) were made (in areas such as core physics tests, and natural circulation experiments). The Agency stated its readiness to initiate such CRPs, and JNC will consider possible future collaboration activities, pending agreements to be reached between interested Member States of the Technical Working Group on Fast Reactor (TWG-FR). JNC agreed to promote such activities in view of international fast reactor R&D collaborations under IAEA aegis.

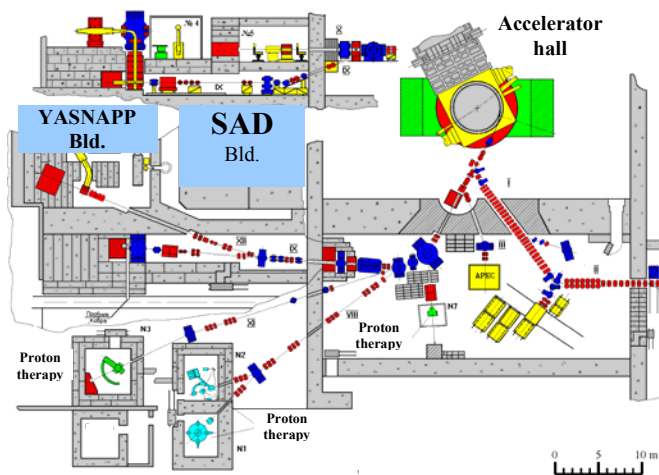
The Project held two Research Coordination Meetings for the CRP on **Updated Codes and Methods to Reduce the Calculational Uncertainties of LMFR Reactivity Effects**, and on **Studies of Advanced Reactor Technology Options for Effective Incineration of Radioactive Waste**, convened in Vienna, and hosted by the Institute of Plasma Physics of the Chinese Academy of Sciences in Hefei, respectively.

In collaboration with NAPC, a Technical Meeting was convened to define the specifications of user **application cross-section libraries for ADS calculations**. The Technical Meeting also defined the procedure for producing the cross-section libraries, and established the corresponding action plan.

Senior experts were invited to advise the Agency with regard to its initiative to **preserve fast reactor data and knowledge** in a consultancy convened in collaboration with the *INIS and Nuclear Knowledge Management Section*. The meeting produced recommendations concerning the general principles, structure, and functions of the proposed IAEA fast reactor knowledge preservation (FRKP) system. In the area of FRKP, the Project is planning for January 2005 two back-to-back Technical Meetings to be hosted by IPPE in Obninsk, Russia. Their objectives are to prepare the CRP on **Analyses of and Les-**

sons Learned from the Operational Experience with Fast Reactor Equipment and Systems, and to offer a global forum for information exchange on the status of fast reactor data retrieval and knowledge preservation activities in Russia.

The TWG-FR Scientific Secretary participated as a member of the SAD/YALINA Steering Committee in its 2nd meeting hosted by the Belarus Academy of Sciences in Minsk. Both YALINA and the Sub-critical Assembly Dubna (SAD) are ISTC projects, and are expected to offer substantial contributions to the Project's CRP on **Analytical and Experimental Benchmark Analyses of Accelerator Driven Systems (ADS)** that will start later in 2005. The planned SAD experimental facility, which consists in the coupling of a 600 MeV proton accelerator with a MOX fuelled sub-critical fast core driven by neutrons produced in a solid lead target, would constitute an important step towards the realization of a transmutation demonstration facility. The meeting has reviewed the progress of both sub-critical experimental projects, particular attention being given to the relevance of these projects to IP-EUROTRANS (within the frame of the EURATOM 6th Framework Programme). Contact: A.Stanculescu@iaea.org.



General plan view of the Dubna Joint Institute of Nuclear Research (JINR) "Phasotron" accelerator and the planned SAD facility (Credit: JINR, SAD Project)

Technology Advances for Gas Cooled Reactors

The Technical Working Group on **Gas cooled Reactors** (TWG-GCR) held its 19th meeting at the university of Manchester, UK in December. 22 international participants, half of whom were observers, attended the TWG meeting. Representatives of the European Commission and OECD/NEA also attended. The agenda included sessions on the status of international High Temperature Gas-cooled Reactor (HTGR) programmes, review of IAEA activities and recommendations on future ones.

There was noted interest in the planned IAEA Coordinated Research Project (CRP) on **HTGR process heat applications (CRP-7)**, as well as on the issues of HTGR spent fuel management and waste minimization. The next meeting is scheduled for the last quarter of 2006.

Also hosted by the university of Manchester during the same week, was an IAEA consultancy on **graphite issues in HTGR designs**. 29 international specialists attended the meeting. The programme included sessions on graphite characterization, core structural design, irradiation behaviour, as well as a panel on graphite replacement, waste management and fuel matrix material. Creep was identified as an important technical issue that could be addressed in a separate specialists meeting. Contact: M.Methnani@iaea.org.

Support for Demonstration of Nuclear Seawater Desalination

The final revised draft of the TECDOC containing the results of the CRP on "Optimization of the Coupling of Nuclear Reactors and Desalination Systems" was prepared and sent for publication (PC/4647).

The third RCM in the framework of CRP on "Economic Research on, and Assessment of Selected Nuclear Desalination Projects and Case Studies" is planned for May 2005. Improvement in the DEEP software is in progress and a new version will be released in early 2005.

Under the inter-regional TC project INT/4/134 on nuclear desalination, three activities were taken up. The final draft of the "**Preliminary economic feasibility of nuclear desalination in Madura Island**" and the "**User requirement document**" prepared by BATAN and KAERI were reviewed. These reports are now ready for submission to the Government of Indonesia for decision. An International Workshop on **Techno-economic Aspects of Nuclear Desalination** was held on Sept. 27-30, 2004 at Jakarta. 45 participants attended the workshop. The Tundesal project between France and Tunisia for the La Skhira site also made progress. The final draft of the Pre-Feasibility Study (PFS) report was prepared and reviewed. Expert missions were provided for the Pakistan National project of setting up a demonstration desalination plant at KANUPP. Progress was made in the project EGY/04/046 for the simulation of nuclear desalination plant.

A Technical Meeting on **Integrated Nuclear Desalination Systems** was held at Chennai on 13-16 Dec. 2004. Ten experts and five observers from ten Member States attended the meeting. A visit to the Indian nuclear desalination demonstration project site at MAPS, Kalpakam was arranged. The experiences of the existing and planned demonstration projects from the Member States was shared in the meeting. Contact: B.Misra@iaea.org.

The 1st European Nuclear Assembly

The first European Nuclear Assembly by FORATOM, held 25-26 Nov. 2004, was participated by 240 people, mostly European nuclear industry, Utility and five Permanent Representatives to EU, forty-five EC staff members, eighteen European Parliament Members, seventeen journalists and some environmental activists. The assembly consisted of two plenary sessions, four topical sessions (Dawn of a new era, Environment, Economics, Safety), dinner speech (by A. Omoto, IAEA, DIR-NENP) and press conference in which a declaration signed by 24 industry executives was delivered.

In this declaration, the European nuclear industry leaders;

- Stated that nuclear-generated electricity should remain at the heart of Europe's energy supply system for the foreseeable future, primarily due to positive contribution to economic competitiveness, maintaining security of energy supply and reducing CO₂ emissions, and

- Called for the creation of a "level playing field" allowing different energy sources, including nuclear, to develop and compete under liberalized market conditions.

In his dinner table speech, A. Omoto had talked about two things; (a) the keys to bridging the gap in the installed nuclear capacity between current 360GWe and projected 1500GWe in 2050 (medium value by IPCC-SRES), and (b) a sort of paradox surrounding the economics of nuclear power – that utilities benefit from the economic competitiveness of current nuclear power but that these same utilities are not willing to invest in new capital-intensive nuclear plants. He discussed such institutional arrangement as lifting the exclusion of nuclear power in the flexible mechanisms of the Kyoto Protocol and also the quantitative assessment of energy security value by use of portfolio theory and macroeconomic model.

Recent Publications

(Year 2004 ~ 2005)

IAEA-TECDOC-1434	Methodology for the assessment of innovative nuclear reactors and fuel cycles: report of Phase 1B (first part) of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO).
IAEA-TECDOC-1411	Use of Control Room Simulators for Training of NPP Personnel
IAEA-TECDOC-1406	Primary Coolant Pipe Rupture Event in Liquid Metal Cooled Reactors
IAEA-TECDOC-1405	Operational and Decommissioning Experience with Fast Reactors
IAEA-TECDOC-1402	Managing modernization of nuclear power plant instrumentation and control systems
IAEA-TECDOC-1400	Improvement of In-Service Inspection in Nuclear Power Plants
IAEA-TECDOC-1399	The Nuclear Power Industry's Ageing Workforce: Transfer of Knowledge to the Next Generation
IAEA-TECDOC-1393	International Outage Coding System for Nuclear Power Plants
IAEA-TECDOC-1392	Development of Instructors for Nuclear Power Plant Personnel Training
IAEA-TECDOC-1391	Status of Advanced LWR Designs: 2004
IAEA-TECDOC-1390	Construction and Commissioning Experience of Evolutionary Water Cooled Nuclear Power Plants
IAEA-TECDOC-1389	Managing Modernization of Nuclear Power Plant Instrumentation and Control Systems
Reference Data Series 2/23	Nuclear Power Reactors in the World, Reference Data Series No. 2
Book	Operating Experience in NPP in Member States in 2003
CD&Book	Country Nuclear Power Profiles 2003 Edition

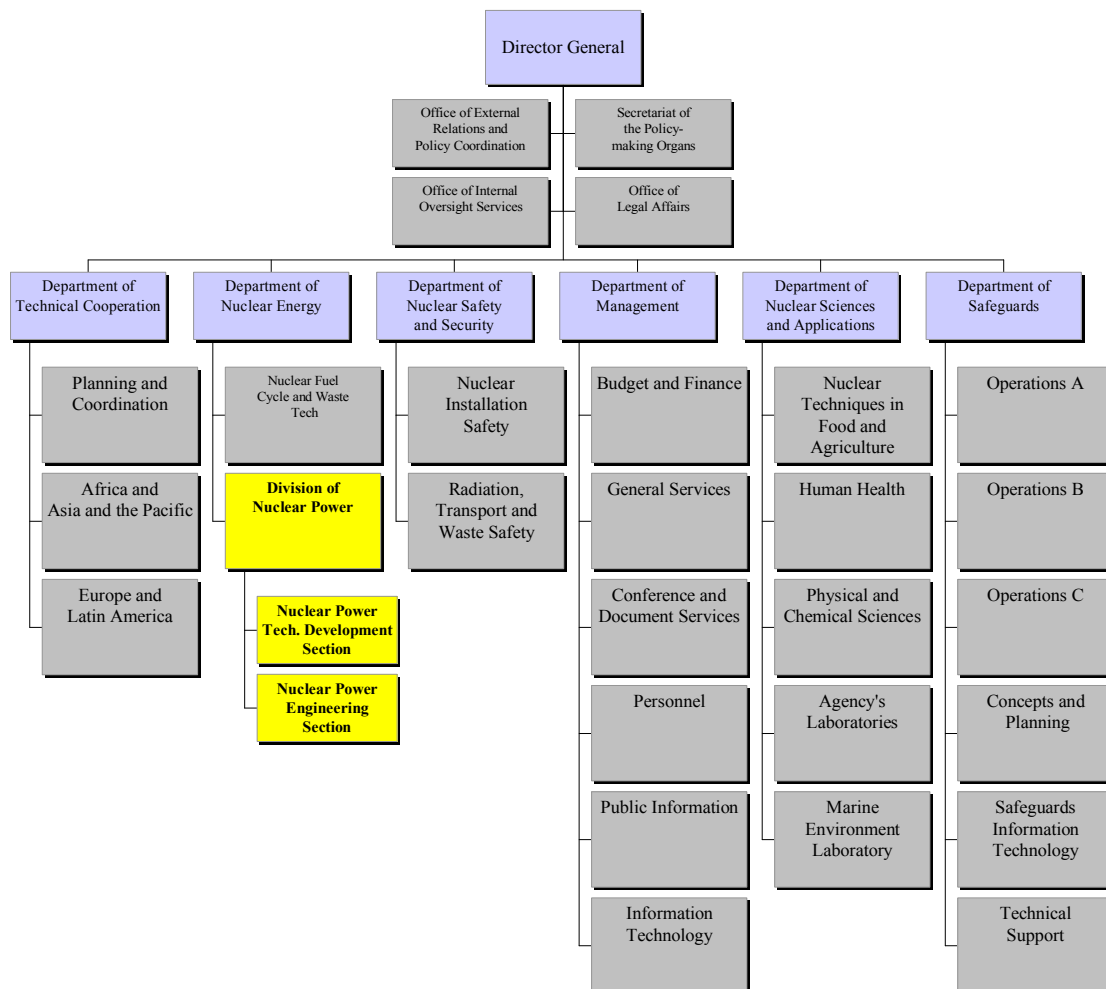
Meetings in 2005

Date	Title	Place	Contact
Jan. 17-Jan. 19	19 th Meeting of the Technical Working Group on Gas Cooled Reactors (TWG-GCR)	Manchester, UK	M. Methnani
Feb. 14-Feb. 18	TM on the CRP on Analyses of and Lessons Learned from the Operational Experience with Fast Reactor Equipment and Systems TM to Coordinate the Agency's Fast Reactor Knowledge Preservation International Project in Russia	Obninsk, Russia	A. Stanculescu
Feb. 15-Feb. 18	TM / Workshop on Recent Material Degradation and Related Managerial Issues of Nuclear Power Plants	Vienna, Austria	K.S. Kang
Feb. 21-Feb. 23	TM on Exchange of Information on National NPP Life Management Programmes (TWG-LMNPP)	Vienna, Austria	K.S. Kang
Mar. 14-Mar. 17	TM to Develop Strategies and Tools for Predictive Maintenance	Vienna, Austria	H. Cheng
Mar. 14-Mar. 17	TM to Review Guidelines on Assessment on NPP Personnel Training	Vienna, Austria	T. Mazour
Mar. 21-Mar. 22	IAEA International Conference on Nuclear Power for the 21st Century	Paris, France	I. Facer
May. 09-May. 12	RCM of CRP on "Economic research on, and assessment of selected nuclear desalination project and case studies"	Vienna, Austria	B.M. Misra
May. 09-May. 13	TM to Review National Programmes on Fast Reactors and Accelerator Driven Systems (ADS) (TWG-FR)	Sao Paulo, Brazil	A. Stanculescu
May. 23-May. 25	Meeting of the Technical Working Group on Nuclear Power Plant Control and Instrumentation (TWG-NPPCI)	Vienna, Austria	O. Glockler
Jun. 13-Jun. 16	TM on Authorization of Control Room Personnel	Vienna, Austria	A. Kazennov
Jun. 13-Jun. 17	TM to Review passive safety design options for SMRs	Vienna, Austria	V. Kuznetsov
Jun. 27-Jun. 30	TM on the On-line Condition Monitoring of Equipment and Processes in NPPs Using Diagnostic Systems	Knoxville, USA	O. Glockler
Aug. 29-Sep. 02	RCM of CRP on natural circulation phenomena, modelling, and reliability of passive systems which utilize natural circulation	Corvallis, USA	J. Cleveland
Sep. 13-Sep. 16	TM on the Impact of Modern Technology on NPP I&C Systems	Chatou, France	O. Glockler
Sep. 19-Sep. 22	TM to Develop a Technical Report on Upgrade and Modernization of NPP Training Simulators	Essen, Germany	Mr. Kazennov
Sep. 26-Sep. 30	TM on Decommissioning of Fast Reactors after Sodium Draining	Cadarache, France	A. Stanculescu
Oct. 17-Oct. 21	TM to Disseminate Good Practices on the Use of Training Approaches, Techniques and Tools to Increase NPP Personnel Training Effectiveness	Vienna, Austria	A. Kazennov
Oct. 17-Oct. 21	TM to Review Experience and Options Relevant for Validation, Testing and Demonstration of Passive Safety Systems for SMRs	Vienna, Austria	V. Kuznetsov
Oct. 17-Oct. 21	RCM of CRP on Intercomparison of techniques for pressure tube inspection and diagnostics	Ontario, Canada	TBD
Oct. 17-Oct. 28	Workshop on Technology and Applications of Accelerator Driven Systems (ADS)	Trieste, Italy	A. Stanculescu
Oct. 31-Nov. 11	Workshop on Nuclear Power Plant Simulators for Education	Trieste, Italy	TBD
Nov. 07-Nov. 11	RCM of CRP on benchmark analyses on up-to-date codes and methods to reduce the calculational uncertainty of the LMFR reactivity effects	Vienna, Austria	Y.I. Kim
Nov. 07-Nov. 10	TM to Develop guidelines on training programmes for the next generation of NPPs	Vienna, Austria	T. Mazour

Date	Title	Place	Contact
Nov. 22-Nov. 25	TM on Implementing and Licensing Digital I&C Systems and Equipment in NPPs	Espoo, Finland	O. Glockler
Dec. 07-Dec. 09	12th Meeting of the Technical Working Group on Advanced Technologies for Light Water Reactors (TWG-LWR)	Vienna, Austria	J. Cleveland
Dec. 07-Dec. 09	8th Meeting of the Technical Working Group on Advanced Technologies for Heavy Water Reactors (TWG-HWR)	Vienna, Austria	J. Cleveland
TBD	TM to Develop guidance on design and operational requirements to enable the management of liabilities arising from decommissioning	TBD	I. Facer
TBD	RCM of CRP on review and benchmark of calculation methods for structural integrity assessment of reactor pressure vessels during pressurized thermal shocks	TBD	K.S. Kang
TBD	RCM of CRP on Master Curve Approach to monitor the fracture toughness of Reactor Pressure Vessel in NPPs	TBD	K.S. Kang
TBD	TM on General Safety Requirements - Resolution of Member States' Comments	Vienna, Austria	P. Vincze
TBD	TM to Develop guidance on the minimum infrastructure necessary to enable Member States to adopt nuclear power (INPRO) to be used	TBD	I. Facer
TBD	TM to Develop guidance on the potential for regional sharing of nuclear power infrastructure	Vienna, Austria	I. Facer
TBD	9th Steering Committee Meeting on INPRO	Vienna, Austria	J. Kupitz
TBD	8th Steering Committee Meeting on INPRO	Vienna, Austria	J. Kupitz
TBD	TM to Describe INPRO related R&D needs related to the six defined case studies	Vienna, Austria	V. Kuznetsov
TBD	TM to coordinate six case studies for the assessment of INSs foreseen	TBD	V. Kuznetsov
TBD	TM / Workshop for Training on INPRO Methodology	Vienna, Austria	V. Kuznetsov
TBD	RCM of CRP on Small reactors without on-site fuelling	TBD	V. Kuznetsov
TBD	TM to Prepare a technical document on 'Advanced Applications of Water-Cooled NPPs'	TBD	J. Cleveland
TBD	TM to Prepare a TRS Report on 'Advances in HWR Designs and Technologies' covering advanced HWR designs, advanced fuels and fuel cycle options	TBD	TBD
TBD	TM to Compare simulation results for abnormal transients for medium-sized HWRs	TBD	TBD
TBD	RCM of CRP on Analytical and Experimental Benchmark Analyses of Accelerator Driven Systems (ADS)	Minsk, Belarus	A. Stanculescu
TBD	RCM of the CRP on Analyses of and Lessons Learned from the Operational Experience with Fast Reactor Equipment and Systems	TBD	A. Stanculescu
TBD	RCM of CRP on "Assessment based on a unified methodology of thorium fuel in emerging nuclear systems"	TBD	Y.I. Kim
TBD	RCM of CRP on conservation and application of HTGR technology: Advances in HTGR fuel technology development	TBD	M. Methnani
TBD	RCM of CRP on "Prospects of potable water co-generation with HTGRs"	TBD	B.M. Misra
TBD	Workshop on Nuclear Desalination Technology and Economics	Trieste, Italy	B.M. Misra
TBD	TM on Integrated Nuclear Desalination Systems in blue book although included in our worksheets	TBD	B.M. Misra

Division of Nuclear Power WebSite Links

Division Introduction: NENP home: <http://www.iaea.org/OurWork/ST/NE/NENP/index.html>



Nuclear Power Engineering Section (NPES)

<http://www.iaea.org/OurWork/ST/NE/NENP/NPES/index.html>

- Main activities and result
<http://www.iaea.org/OurWork/ST/NE/NENP/NPES/Activity/index.html>
- Publications and documents
<http://www.iaea.org/OurWork/ST/NE/NENP/NPES/publications.html>
- Contact persons
<http://www.iaea.org/OurWork/ST/NE/NENP/NPES/staff.html>
- Databases (PRIS, CNPP, ENTRAC), software (SAT) and downloads
<http://www.iaea.org/OurWork/ST/NE/NENP/NPES/Downloads/index.html>
- **NEW!** Electronic Nuclear Training Catalogue (ENTRAC) Phase II has been completed in December 2004: <http://entrac.iaea.org>

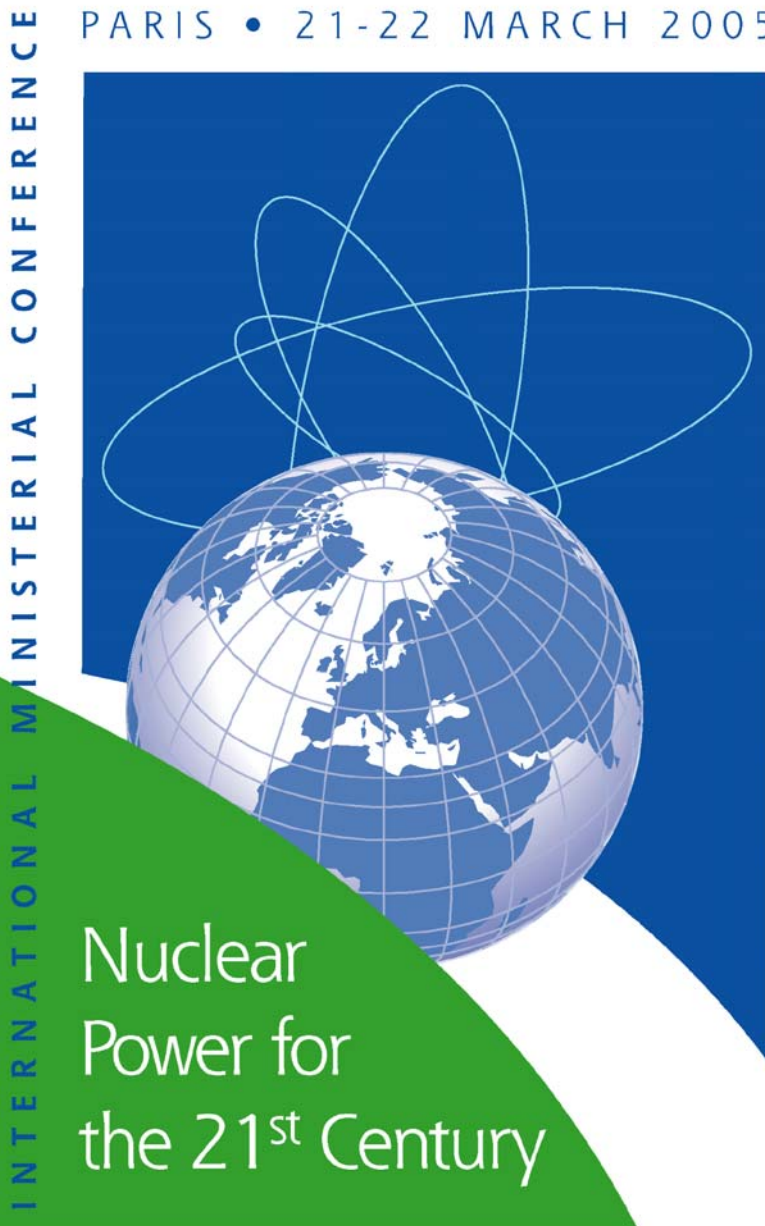
Nuclear Power Technology Development Section (NPTDS)

<http://www.iaea.org/OurWork/ST/NE/NENP/NPTDS/Projects/index.html>

- Databases and software
 - ▶ Fast Reactors Database:
<http://www-frdb.iaea.org/index.html>
 - ▶ ADS Database:
<http://www-adsdb.iaea.org/index.cfm>
 - ▶ User friendly education with nuclear reactor simulators
<http://www.iaea.org/OurWork/ST/NE/NENP/NPTDS/Projects/edu.html>
- Active Co-ordinated Research Projects (CRPs)
<http://www.iaea.org/OurWork/ST/NE/NENP/NPTDS/crps.html>
- Technical Documents Published by NPTDS 1997-2004
<http://www.iaea.org/OurWork/ST/NE/NENP/NPTDS/docs.html>

International Ministerial Conference "Nuclear Power for the 21st Century"

PARIS • 21-22 MARCH 2005



The International Ministerial Conference on "Nuclear Power for the 21st Century" will be held on 21 and 22 March 2005, Paris, France.

The conference will provide a platform for discussion on the future role of nuclear energy. It will enable many interested Governments and other parties to present and discuss the future of nuclear energy. The Conference will also include sessions to discuss major issues as follows:

- *World energy needs and resources*
- *Environmental challenges*
- *Driving factors for strategies and choices*
- *Governance issues.*

From more than 25 countries Ministers will present their national views on the need for and future of nuclear power. Representatives from over 50 countries and several international organizations are registered to take part.

Please visit the conference web sites regularly for information regarding this conference at:

<http://www.parisnuclear2005.org>,

<http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=122>

Addressing Energy Needs and Environmental Challenges



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International Atomic Energy Agency

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Wagramer Strasse 5, P.O. Box 100,
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