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The ANS Globe

...e-news from the ANS International Committee

From the editors

The ANS Globe is the Bulletin of the American Nuclear Society's International Committee. *The ANS Globe* has as its mandate the dissemination of news of international interest to International Committee members and to others.

We would like to keep *The ANS Globe* current and relevant. Please send us your letters, articles, news and/or comments for consideration towards the next issue.

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Contents

<u>From the Chair</u>	p. 2
<u>In Memoriam: Gail de Planque</u>	p. 3
<u>The ANS International Committee's Web Page</u>	p. 3
<u>News from Sister Societies and International News</u>	p. 3
<u>News from ANS Divisions</u>	p. 22
<u>Highlights from the 2010 June Meeting in San Diego, CA</u>	p. 24
<u>International Forum for Reactor Aging Management (IFRAM)</u>	p. 34
<u>Societies with Collaboration Agreements with ANS</u>	p. 38
<u>Calendar of Events</u>	p. 39
<u>Contact ANS International Committee Members by E-mail</u>	p. 43

From the Chair



Dear friends:

(For this issue, International Committee Chair [France Brès-Tutino](#) has ceded her foreword “From the Chair”, which usually appears here, to ANS President [Joe Colvin’s](#) message.)

Hello to all International Members of the American Nuclear Society!

I am honored to serve as your President for the 2010-2011 years. I have been associated with the Society since 1980 and have seen the important role the Society has played in the nuclear science and technology areas. A very important element of that work has been the contributions of the International Committee and its members and

I’m very excited about the tremendous opportunities we have to share the experiences and knowledge of the International Community and bring that knowledge base to the benefit of the Society at large.

The old saying that we live in exciting times could not be truer today for those of us working in the nuclear science and technology field! Every day in the news, we are reminded of how important our work is in providing solutions to problems in energy, environmental and medical and other related areas where nuclear applications make significant contributions to the society at large. This is especially true when we look at what’s happening around the globe. The expansion of nuclear energy, in new nuclear build, is growing every day with new plants being planned and under construction in many countries.

The theme of the ANS Winter Meeting in November in Las Vegas is “Nuclear Progress,” a theme that could not be more appropriate in today’s rapidly changing times. A major element of this meeting is to share the international experiences from around the world with the Society members and capitalize on communicating these positive messages with policy makers, the media and the general public. We are making great progress in new nuclear build in the United States, with new nuclear plant construction at Vogtle and Summer plants, and the international experience provides important support to those activities. The recent announcement by the Department of Energy to build a prototype Hyperion SMR at the Savannah River Plant is a major step forward in the efforts to develop Small Modular Reactors. The Hyperion SMR is a 25-MW fast reactor that uses uranium nitride fuel and lead bismuth (liquid metal) coolant and may provide hydrogen production for biofuels.

The Winter Meeting has three important embedded topical meetings that round out the overall theme of Nuclear Progress, including the 19th Topical Meeting on the Technology of Fusion Energy, the 7th International Topical Meeting on Nuclear Plant Instrumentation and the Topical Meeting on Isotopes for Medicine and Industry.

The International Committee has a very important role to play for the Society and I strongly encourage you to attend and participate in this important meeting. I look forward to seeing you in Las Vegas.

As your ANS President, I am honored to be involved with an organization that envisions even further potential for nuclear technology through dramatic and continued expansion. Your involvement and support is essential to our continued success!

Joe Colvin



In Memoriam: Gail de Planque (1945-2010)

With great sadness, we inform you that the Honorable E. Gail de Planque passed away on September 8 from a severe Lyme disease. Well known in the nuclear community -particularly within the ANS where she was deeply and continuously involved, up to the Presidency in 1988-1989 - she had a broad impact in the field of nuclear energy, both in the US and internationally, and was in great demand as a consultant in nuclear energy matters. Her last position was President of Strategy Matters Inc. and Director, Energy Strategists Consultancy, Ltd. Her distinguished and impressive career includes serving as the Director of the DOE's Environmental and Measurement Laboratory in NYC and later as a Commissioner with the US.NRC from 1991 to 1995, and extensive involvement with the IAEA. She had a wide range of experience advising the nuclear industry and served on numerous Boards of Directors in the US and abroad. She was awarded many prestigious distinctions and fellowships, and remains an outstanding role-model for scientific female students and young women engineers. All her nuclear friends and colleagues recall her integrity, her natural human warmth as she was willing to build trust and consensus or to offer an optimistic vision to young scientists. As Joe Colvin mentioned when Gail was presented the Henry deWolf Smyth Nuclear Statesman Award in 2003: *"Dr. de Planque's outstanding leadership, in both the government and private sector and her scientific contribution are immeasurable"*. And during this ceremony, she remarked: *"So far it's been an incredible international journey..."*



The ANS International Committee's Web Page

Visit the enhanced ANS International Committee's Section on the ANS website, located at <http://www.ans.org/const/international>. It includes:

- Background information about the ANS International Committee
- Connections to ANS International Local Sections
- An overview of Society alliances with international organizations (INEA, INSC, and PNC), along with contact information
- Connections to 30 ANS Agreement Societies/Organizations, and
- Current/back issues of *The ANS Globe*, which features ANS International Committee activities and related items.

News from Sister Societies and International News

- [Austria Local Section of ANS \(http://local.ans.org/austria/\)](http://local.ans.org/austria/)

We have information on some talks organized by the Austria Local Section:

- On February 23rd, 2010, [Dr. Ross T. Thomas](#), Vice President and Chief Technical Officer for the B&W Technical Services Group, Inc., gave a presentation titled **"Nuclear Initiatives by the Babcock & Wilcox Company"**. Dr. Thomas discussed nuclear power and topics related to the Babcock & Wilcox Company. He provided a brief history of this 140-year-old international firm. Recent B&W developments including an advanced light-water, modular power reactor and an aqueous

homogeneous reactor for the production of medical isotopes were discussed. The demand for experienced nuclear professionals was also illustrated.

- On September 21, 2010, [Dr. Eric P. Loewen](#), 2010-2011 American Nuclear Society Vice President / President-Elect, gave a presentation titled “**Our Emerging Future -- SMRs, University Research, and Blue Ribbon Commission**”. Dr. Loewen discussed the emerging technical futures in which the American Nuclear Society will play a major role, e.g., in the areas of small modular reactors, university research and supporting the efforts on the Blue Ribbon Commissions. ANS' key to the future, the key to success is continuing the participation and the technical contributions from the ANS membership in these areas.

In addition, [International Committee member Andreas Kronenberg](#) sent the following contribution from the Young Generation of the Austrian Nuclear Society:

Up to the 1970ies Austria was, like most other European countries, a state eager to develop and use nuclear technologies. The Austrian government therefore also started to build a NPP – the BWR Zwentendorf. The plant was finished in 1978; the fuel was already on site, when Western Europe’s anti-nuclear movement reached Austria, and people started questioning the safety of nuclear energy. The Chancellor of the time, Bruno Kreisky, decided to hold a referendum on starting up Zwentendorf. He was a huge promoter of the NPP, and announced that he would retire if the result was negative. The opposition, which was also pro-nuclear, used this statement to decrease the political influence of the chancellor’s party. Hence this attitude had a significant impact on the result. In the end, only 50.2 % of the population voted against Zwentendorf, and the plant was never taken into operation.

The Austrian Nuclear Society (Österreichische Kerntechnische Gesellschaft - ÖKTG) was founded in 1980 with the aim of starting Zwentendorf, which had been preserved until further decisions were taken. In 1986, a new referendum was scheduled, but due to the Chernobyl accident it was never realised. From this time on the ÖKTG tried to provide unbiased information on nuclear topics.

After 2000, a few young people, who were strongly supported by Chairman Professor Helmuth Böck, got interested in nuclear technologies. The Young Generation was then founded in 2006 by Otmar Promper. The main purpose was to provide students with unbiased information about Nuclear Technologies. The group grew steadily and young professionals also joined our society. Today we count around 50 members under the age of 35; many of them are still at university, studying mostly nuclear physics, electro technical engineering, mechanical engineering, process technology or related subjects. The young professionals work mainly at AREVA, Westinghouse, the research centre Seibersdorf or at the IAEA.

As the group size increased, the focus changed: today, we do not only exchange information within the group, but we also try to build an expert network for all questions related to nuclear technologies. We try to change the attitude towards nuclear technologies in Austria.

We are quite active also within the European Nuclear Society – YGN. In September

2010 we organised an excursion to Olkiluoto, Finland. This visit was organised in cooperation with the Finnish YGN. 15 of our members participated. The journey started on September 6 with the flight from Vienna to Helsinki. From there we continued by train and bus to Rauma. On Tuesday morning a TVO bus took us to the island of Olkiluoto, where the two existing NPPs Olkiluoto 1 and 2, as well as the new EPR, are situated. Nearby on the same island, there is also a storage for spent fuel, as well as a final repository for low- and mid-active waste.

The Finnish YGN gave an overview of the ongoing projects, TVO in general, and the two existing plants OL1 & 2. After lunch we had a guided tour through the OL1 plant. It was a very detailed visit of the plant: We were taken to workshops, the Turbine Hall, and the Reactor Hall. From the Control Room level down, we were able to enjoy a nice view over the whole island from a glass elevator. The planned visit to the spent-fuel storage had to be cancelled, as there was ongoing work.

After a short break, we got a guided tour through the Visitor Centre. One of the focuses was on the final waste deposit, another on the OL3 project. We concluded the day with presentations about Austria; the history of the ÖKTG and the current situation on nuclear energy discussion.

The evening was organised by our Finnish host, we spent some time together at the sea side.

The next morning started again with presentations, this time about the OL3 and the OL4 project. After an early lunch, we finally visited the OL3 building site and walked around the construction area, guided by the future operators of the plant. The walk-through included a detailed visit to the Turbine Hall, which is almost finished. We were then allowed to go to the final repository of the low- and mid-active waste. It is located 60 m under the earth's surface, in the rocks of Olkiluoto island. We saw the two silos, where the waste is stored, as well as a part of the project for the final repository for spent fuel. Two presentations about the final waste management concluded our technical visit. In the evening we went back to Helsinki for some sightseeing on the next day.

To summarize this journey, it was very well organised; the Finnish YGN did a great job. It was very interesting for us to see the construction site. Since many of us work in German NPPs, we were able to compare the design changes and the improvements to the Konvoi – NPPs.

Another activity was the organisation of the 3rd Core Committee Meeting of the ENS – YGN in Vienna. It took place from September 17 to 19, and we could welcome 22 participants from all over Europe. The meeting included three technical visits: one to the IAEA, where we were able to visit the Incident and Emergency Centre, as well as the Safeguards Laboratories. The second tour concerned the TRIGA Mark II Research Reactor at the Technical University of Vienna, and the 3rd visit to the (never taken into operation) NPP Zwentendorf. It was a great success.

In the near future we are going to Austrian schools to present the topic on Radioactivity and Nuclear Technologies as it is currently either avoided or touched

only briefly by the teachers. These schools can later on also book a tour of the university's research reactor, where they will even be able to do little experiments and measure radioactivity. For next year we are planning an excursion to Chernobyl.

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- [Canadian Nuclear Society \(CNS\)](http://www.cns-snc.ca) (<http://www.cns-snc.ca>)

AECL's NRU (National Research Universal) research reactor at Chalk River received authorization from the Canadian Nuclear Safety Commission to restart in early July. NRU had been on shutdown for more than a year because of a leak in its calandria (reactor vessel). NRU is the world's leading producer of medical radionuclides, and its restart meant that the supply of radionuclides to the world's hospitals could finally come back to normal, to the relief of medical practitioners.

The Canadian Nuclear Society is looking forward to a very busy year in 2011, when it will organize and host several major international conferences:

- The 5th International Symposium on Supercritical-Water-Cooled Reactors (ISSCWR-5), 2011 March 13-16, Vancouver, British Columbia, <http://www.cns-snc.ca/events/isscwr-5/>
- The 32nd CNS Annual Conference and 35th Annual CNS/CNA Student Conference, 2011 June 5-8, Niagara Falls, Ontario, <http://www.cns-snc.ca/events/conf2011>
- CNS Conference on "Waste Management, Decommissioning and Environmental Restoration for Canada's Nuclear Activities", 2011 September 11-14, Toronto, Ontario, <http://www.cns-snc.ca/events/waste-management-decommissioning-and-environmental/>
- NURETH-14, 14th International Topical Meeting on Nuclear Reactor Thermalhydraulics, 2011 September 25-29, Toronto, Ontario, <http://cns-snc.ca/events/nureth-14/>
- CNS "Conference on the Future of Heavy-Water Reactors", 2011 October 2-5, Ottawa, Ontario, <http://www.cns-snc.ca/events/cns-fhwr/>
- The 9th International CANDU Maintenance Conference, 2011 December 4-6, Toronto, Ontario

- [Chinese Nuclear Society](#)

[Dr. Changxin Liu](#), Deputy Secretary-General of the Chinese Nuclear Society, sends the following report

The Chinese Nuclear Society will keep working for a successful 2011 Water Reactor Fuel Performance Meeting/LWRFPM/TOPFUEL, to be held 2011 September 11-14 in Chengdu, China, where the nuclear power program is developing in fast track and it is a good place for a successful Nuclear Fuel meeting. Obviously, success can be achieved only through the joint efforts of our co-sponsoring sister societies.



- [Czech Nuclear Society](#)

[Dr. Václav Hanus](#), of the Czech Nuclear Society, reports that something important and interesting for the nuclear power community has happened in the Temelín NPP: the placement in interim storage of the first spent-fuel container. The press release of 2010 September 10, from Marek Sviták, Press Agent of the ČEZ Group, Temelín Nuclear Power Plant, follows:

‘CASTOR, the spent fuel container, was loaded to the prepared interim storage at the nuclear power plant site on Wednesday 8 September. It is the first container to be filled and placed in storage at the power plant. Such a handling procedure will now be a part of every outage of the Temelín NPP units.

“In terms of construction, technology and legislation the storage is prepared to start the annual trial operation. We shall place one or two spent fuel containers from every unit to the storage every year”, says Miloš Štěpanovský, director of the Temelín NPP and adds: “Two containers contain spent fuel, which produced 7 billion kWh of electrical power during one campaign. The volume of two CASTOR containers used at the Temelín NPP is only a total of 46 m³.”

Due to the fact that a nuclear power plant does not produce any emissions of carbon dioxide during production, such an amount of electricity means savings of 7 million tons of this greenhouse gas. The storage capacity is 1,370 tons of uranium, which represents spent fuel for the 30-year operation of the Temelín NPP. Such an amount of fuel fits in 152 CASTOR containers placed in storage halls. The CASTOR containers were manufactured and delivered by GNS, German manufacturer. “Placing the spent fuel in storage containers is the most frequent way of storing spent fuel storage. It is a safe and controlled technology without any effect on the environment. In the Czech Republic we have already had 15 years of experience with this type of storage from the Dukovany NPP, where two storage containers have been in operation.” Jan Coufal, Manager of the ČEZ Spent Fuel Storage project team describes experience of spent fuel storage.

Nineteen fuel assemblies fit in every container used at the Temelín NPP. These steel containers create the main barrier between spent fuel and the environment “They are strictly tested before use and their quality is consequently certified by the issue of a licence by the State Office for Nuclear Safety which permits their use in the Czech Republic” Mr. Coufal adds.

Spent fuel can be kept in the containers for up to 60 years. Spent fuel reprocessing technologies are already known in the world. According to the valid State Energy Concept the Czech Republic takes the line of temporary storage as a way of permanent repository. The ČEZ company does not consider spent fuel to be a waste product, but a precious power source which can be reused in future, not kept in a repository. “Just four per cent of fuel is used in the reactor. Therefore we can see spent fuel as an important power potential for the future. Reprocessing technology already exists to enable spent fuel to be reused. In Europe such technology has already been used in France and England. Its high cost prevents its extension. Due to the estimated rise of uranium prices on world markets such technology will become

an interesting alternative for power companies,” Miloš Štěpanovský, director of the nuclear power plant, explains the possibility of the further use of spent fuel.

Spent fuel interim storage is a reinforced concrete building, which consists of receiving and storage section. The storage building is resistant to external extreme natural effects (seismicity). A hypothetical fall of a large airplane has been analysed within the EIA process. From the conclusions drawn no radiation accident should arise.

The plan to build spent fuel storage on the premises of the Temelín nuclear power plant has gone through a very difficult procedure, in which the neighbouring countries of Austria and Germany have also been involved in for the first time in history. During the legislative proceedings the Ministry of Environment issued a positive EIA opinion. The State Office for Nuclear Safety permitted the construction in terms of nuclear safety. A special expert committee of European Union also assessed the storage. The investor was awarded positive opinions in all administrative actions. ČEZ received the final building permit in February 2009, i.e. after 5.5 years of administrative preparation. The length of permit procedures for similar projects in the Czech Republic belongs to the longest ones within the European Union. For example, an approval process for a nuclear power plant in French Flamanville took less than two years.’



History of the permit procedure of the Spent Fuel Storage at Temelín NPP

Preparatory legislative step	Date
Information on the plan and start of the Environmental Impact Assessment (EIA – international).	21 July 2003
Public discussion on EIA-České Budějovice.	24 August 2005
Positive opinion of the Ministry of Environment of the Czech Republic on EIA.	28 November 2005
Consent of EU commission in terms of eliminating the cross-border effects of the construction.	24 November 2005
Positive opinion of the State Office for Nuclear Safety regarding location of storage.	29 December 2005
Submitting an application for a zoning and planning permit to the Construction Office.	21 April 2006
Regional Authority of South Bohemia issued a positive zoning and planning permit.	25 October 2006
Ministry cancelled the decision and returned it to the Regional	21 March 2007

Authority of South Bohemia to discuss it.	
Regional Authority of South Bohemia issued a second positive zoning and planning permit.	24 August 2007
Ministry cancelled the decision and returned it to the Regional Authority of South Bohemia to discuss it.	24 January 2008
Regional Authority of South Bohemia issued a third positive zoning and planning permit.	14 April 2008
Ministry rejected all cancellations and approved the decision of the Regional Authority.	18 July 2008
The zoning and planning permit became valid.	23 July 2008
The State Office for Nuclear Safety issued a building permit; the State Office for Nuclear Safety assessed the construction in terms of physical protection, nuclear safety and radiation protection.	August 2008
Submission of an application for a building permit to the Ministry of Industry and Trade.	4 September 2008
The Ministry of Industry and Trade issued the building permit.	11 November 2008
Emergency planning zone association at Temelín NPP appealed against the decision.	24 November 2008
The Minister of Industry rejected the appeal and approved the validity of the building permit.	12 February 2009
The building permit became valid.	23 February 2009
Construction started.	4 February 2009
First CASTOR container was placed in spent fuel storage.	8 September 2010
Trial operation of spent fuel storage started.	9 September 2010

- [France](#)

The New European Nuclear Energy Leadership Academy (ENELA)

[Jean-Claude Gauthier](#), Chair of the French Section and first Director of ENELA, sent this article on ENELA.

The European Nuclear Energy Academy (ENELA) has been founded by the companies AREVA, Axpo AG, EnBW, E.ON Kernkraft GmbH, URENCO Ltd and Vattenfall AB following a Multi-Party-Agreement signed on 28/01/2010. The founding shareholders agreed on its location at Garching, near Munich (Germany). This initiative, which as a concept has its origin in the European Nuclear Energy Forum (ENEF), was highly welcomed by the European Commission.



“This is a very important and unique signal. The Academy addresses the strong need for joining our efforts in attracting and training, on an international level, the best heads for the European Nuclear Community”, commented Dr Stephan Döhler, Executive Vice President of Axpo AG and Chairman of the ENELA Shareholders’ Meeting.

In the wake of Europe’s nuclear energy renaissance, the purpose of the Academy is to train young graduates and high potential employees with different backgrounds to become leaders or to prepare them to take broad responsibilities in European nuclear energy corporations and institutions. The Academy is offering both a comprehensive Nuclear Energy Management Program and a Leadership Cycle based on a theoretical and practical approach focusing on specific European requirements and specifications

(economics, politics, technology, legislation, safety standards, certifications, etc.).

Dr. Walter Hohlefelder, Member of the Supervisory Board of E.ON Kernkraft GmbH and Chairman of the ENELA Advisory Board, added: “...ENELA could become in the future the one European institution in the field of nuclear energy management and leadership training. ENELA welcomes further organizations and institutions to support or join the initiative”.

Also aiming for serving as a think tank, the Academy will bring together members of the international nuclear community, comprising employers, prospective employees as well as political and social opinion leaders. It will endeavour to facilitate a dialogue with industrial and non-industrial stakeholders, while improving mutual awareness and understanding of nuclear energy.

- [ANS French Section \(http://local.ans.org/france\)](http://local.ans.org/france)

VICE PRESIDENT LOEWEN’S VISIT TO FRANCE AND GENERAL ASSEMBLY

Following tradition, the French Section invited [ANS President Joe Colvin](#) to its General Assembly. On account of his busy schedule, Joe Colvin could not come and the ANS was represented by [Vice President Eric Loewen](#). At this meeting, held in Paris on September 16, Dr. Loewen gave a presentation on “**Nuclear Policy: What Can We Learn from Each Other**” to a large audience including, in particular, many young nuclear engineers and students as well as senior executives from French nuclear research and industry, representatives from ministries, the US Embassy in Paris, the French-American Foundation and international agencies. In addition to Vice President Loewen’s lecture and French Section President Gauthier’s Annual Report, four items on the agenda were devoted to the **Young Generation**:



- A report by a French student, Romain Vial, regarding his Summer internship at Berkeley
- A report by a French student, Antony Roux, regarding his Summer internship at Michigan University
- The third student report, from Marianne Borzic who had worked at MIT, was presented by Martine Mayousse, French Section Secretary General.



Romain Vial



Antony Roux



Martine Mayousse

The Young Nuclear Engineering Award was granted by the French Section to Lucie Gangolf, who has just graduated, ranking first from the French Institute for Nuclear Science and Technology. She will select an ANS Meeting to be held in the US and her grant will support her travel expenses, registration fee and accommodations during the meeting.

Furthermore, on the occasion of this French Section General Assembly:

- **The ANS 2010 Bennett Lewis Award for Sustainable Energy** was presented by Vice President Loewen to **Dr. Georges Vendryes**, Emeritus Director at the French Atomic Energy Commission. Established in 2006, this award is administrated by the Environmental and Sustainable Development Division to recognize persons who have made major lifetime contributions in nuclear science and engineering towards attaining long term global sustainable energy development.



In addition, during his visit in France, **Vice President Loewen** met with the French Section Board in order to review the relationship between the ANS and the Section and to discuss how to enhance the international role of the Society. His program also included a technical visit to the AREVA spent fuel reprocessing plant at La Hague.

INTERNATIONAL CONFERENCES

As on a regular basis each year, a great number of Section members are directly involved in the sponsorship and organization of ANS Topical Meetings and periodic international conferences. For instance, several French nuclear experts have arranged at the incoming Winter Meeting a

- **Special Meeting between US Engineering Professors and French Reps on Education & Training: November 9, 2010**

The purpose of this invited meeting is to enhance and develop the relationship between France and the USA in the nuclear field, in particular on Education and Training. It is mainly targeted to the Education and Training of Executive members, and specifically to the US professors who have already been in France as participants in several Nuclear Technical Tours (“Nuclear Tour de France”) organized by the French Section in previous years. With the experience and feedback from US professors’ previous visits in France and recent developments in Nuclear Education and Training in both countries, this meeting gives the opportunity to enhance exchanges between the US and France and further discuss an extended cooperation.

- **ICAPP 2011 - Nice May 2-5 Mark your calendar!**

This International Congress on Advances in Nuclear Power Plant is organized by the French Nuclear Energy Society and co-sponsored by AESJ, ANS and KNS in collaboration with 13 nuclear societies and agencies. See **www.sfen.fr**. Focusing on “**Performance and Flexibility: The Power of Innovation**”, this Congress will review the recent evolution in reactor physics, thermal-hydraulics, materials, operation and

maintenance, safety and licensing of NPP.

NEWSLETTER AND WEBSITE

The French Section is publishing its periodic Newsletter [SF@NS.news](#), sent out by e-mail to its members and more extensively to readers interested in American-French nuclear relations. It aims to give more specific and updated information on nuclear power development in the US and highlight major events regarding ANS international strategy and relevant French Section actions. In addition, a special **French Section homepage appear on the ANS website/International Section**; it is dedicated to French nuclear news and SFANS projects as well as to [SF@NS.news](#) issues.

THE NEW BOARD OF THE FRENCH SECTION

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From left to right: Martine Mayousse - Secretary General, Jacques de la Ferté, France Brès-Tutino, ANS Vice President Eric Loewen, Dominique Grenêche - Past Chair, Jean-Claude Gauthier - Chair, Rosine Couchoud, Alain Kavenoky, Michel Debès - Vice Chair, Thierry Ethvignot.

- [India \(http://www.ins-india.org\)](http://www.ins-india.org)



R.K. Singh, Secretary of the Indian Nuclear Society (INS), sent the following report during the summer:

- Our INS National Seminar on “Atomic Energy Empowering the National Development” (AEEND-2010) organized on July 24, 2010 at Daulatrao Aher College of Engineering, Karad, Maharashtra was very successful. Shri S.P. Dharne Outstanding Scientist & Associate Director, CFD & FA Nuclear Power Corporation of India Limited & INS EC member, was the Chief Guest. The inauguration program was presided over by Dr. Ashok G. Gujar, Chairman, G.K. Gujar Memorial Charitable Trust, Karad. The speakers were Dr. V.N. Yelgaonkar (BRIT), Dr. J.R. Bandekar (FTD, BARC), Shri N.G. Dutta (retd., AFD, BARC now in M/S. KAY BOUVET ENGINEERING PVT. LTD, Satara). The program was covered by media and the local TV Channel. A cheque (Rs. 1.0 lakh) and application for Corporate membership was presented by Shri Dutta to enroll M/S. KAY BOUVET ENGINEERING PVT. LTD, Satara as corporate member. M/S M/S. KAY BOUVET ENGINEERING PVT. LTD, Satara has started manufacturing components for BHAVINI and planning to open new shop for nuclear. They are very happy to work with Indian Nuclear Society.
- We have organized the INS National Seminar on “Indian Nuclear Programme: Pride of India” (INPPI-2010) on Saturday, August 21, 2010, at College of Engineering, Teerthanker Mahaveer University, Moradabad, U.P. Dr. Prabhat Kumar, Distinguished Scientist & Project Director, Bhartiya Nabhikiya Vidyut Nigam Limited Kalpakkam was the Chief Guest. Honb’le Prof. R.K. Mittal, Vice Chancellor, Teerthanker Mahaveer University presided over the function. The seminar was organized by Prof. (Dr.) K.K. Pande, Director, Teerthanker Mahaveer College of Engineering, Moradabad, U.P.
- INS National Seminar on “Atomic Energy for Peace, Power and Prosperity” (AEPPP-2010) was held at Manipur University Canchipur, Imphal, Manipur on August 28, 2010. Dr. S. Kailas, Distinguished Scientist & Director, Physics Group, BARC, kindly consented to be the Chief Guest. The inauguration function will be presided over by Hon’ble Prof. Chabungbam Amuba Singh, Vice-Chancellor, Manipur University. Prof. K. Yugindro Singh, Convenor, AEPPP-2010, Manipur University, reports that “AEPPP-2010 turned out to be a big success, despite facing many obstacles in the University. Many senior citizens of the State have congratulated me for making the function one of the most spectacular big shows of the State. The entire programme of the seminar was relayed for 3 days continuously on a local TV channel (ISTV) after the seminar was over because of its great demand from the public.” There are plans to publish the Proceedings of the Seminar.
- We have planned the Second International Conference on “Asian Nuclear Prospects (ANUP 2010)”, <http://www.anup2010.com/>, for Oct. 11-13, 2010, at Radisson Resort Temple Bay, Mamallapuram. Under the leadership of

Distinguished Scientist Dr. Baldev Raj, Director, IGCAR, preparations are progressing well, with excellent response from India and abroad. We have received the cooperation of IAEA in organizing ANUP 2010. The welcome reception and inauguration of the conference will be held on 10th Oct. 2010. Dr.S. Banerjee, Chairman, AEC of India, will be inaugurating the Conference. About 50 foreign delegates including 29 eminent speakers are participating, and IAEA is sending a team of three specialists to attend. From India, we have 22 invited speakers. Additionally, we have selected 110 contributed papers received from all over the world for presentation as posters. We are also planning a Young Researchers Forum consisting of 8 oral presentations by young scientists and engineers, based on the abstracts received from India and abroad. There will be a panel discussion presided over by Dr Anil Kakodkar on the last day of the Conference.

- We have started massive corporate membership drive approaching hundreds of Corporate houses for membership. We have received very good response. Earlier 40 companies, and later 11 more companies, have become corporate members.
 - The Mysore Branch organized a seminar 2010 September 25 at Sri Jayachamarajendra College of Engineering, Mysore. The talk on “Nuclear Agriculture- Accomplishment and Societal deployment” was delivered by Dr.S.F. D’Souza, Associate Director, Bio-Medical Group, BARC, Mumbai and the talk on “Nuclear Technology for Human Welfare” was delivered by Shri. R. K. Singh, Secretary, INS, Mumbai.
 - Under the guidance of Dr. V.K. Iya, we have planned an INS National Seminar on “Food Security, Safety & International Trade: Role of Radiation Technology” on November, 20, 2010. Dr. S. Banerjee, Chairman, AEC of India, will be inaugurating the Seminar. Dr. R.K. Sinha, Director, BARC & Vice President, INS, will release the INS position paper on “Food Security, Safety & International Trade: Role of Radiation Technology”.
 - We have planned an INS National Workshop on “Seismic Design of Industrial Structures, Equipment and Piping Systems” for November 8-12, 2010, at Mumbai.
 - Under a massive public awareness program, we are crisscrossing the nation.
- [Italy](#)

Co-Editor Mauro L. Bonardi provides the following news from Italy:

- The Italian Agency for Nuclear Safety (**Agenzia per la Sicurezza Nucleare**) is a public authority established by the Italian Parliament on Aug 15, 2009. The rules of the agency have been approved by Prime Minister Silvio Berlusconi on July 7, 2010. The candidates as President of the Agency are the Oncologist Prof. Umberto Veronesi and the Prof. of Nuclear Plants at the University of Roma “La Sapienza”, Maurizio Cumo.
- During a recent business and policy conference in Cernobbio (Lake of Como), Sept. 5, 2010, an international study presented argued strongly for the introduction of nuclear energy in Italy, saying the country can diminish its dependency on foreign nations and cut carbon emissions. The study was carried out by experts, including

some from the Italian energy company ENEL, France's EdF (which in 2009 formed a joint venture to develop nuclear energy in Italy), and IAEA as well.

- Prime Minister Silvio Berlusconi, who has made the construction of nuclear power plants in Italy one of his government's goals, said in April 2010 that he expected the construction of the first nuclear reactor in Italy to get going within three years. A nuclear plant takes seven years and between €4 and 5 billion (\$5 billion to \$6.25 billion) to build, according to Fulvio Conti, the CEO of ENEL, who attended the presentation of the study. Italy in particular has an incentive to turn to nuclear power, because 86 percent of its energy comes from foreign countries - well above the EU average of 53%. Moreover, the cost of a kW.h in Italy is 70% larger than the average in EU countries. By introducing nuclear energy, between 2020, when plants might begin working, and 2030, when they should account for 25 percent of electricity supply, Italy might save up to €9 billion (\$84 billion) in generation costs and cut up to 381 million tons in carbon emissions, according to the study (see also presentation of Dr. Stefano Monti in this same Issue of The Globe). The study was put together by the European House Ambrosetti consulting firm, which organizes the annual conference on Lake Como.
- Domestic critics of Berlusconi's nuclear policy say Italy should invest more in renewable clean energy. Nonetheless, last year Italy approved a law allowing it to return to nuclear energy. The agreement between ENEL and EdF that followed soon after was billed as a first significant step toward establishing NPPs in Italy. Discussions are also on-going between the Italian Government and Westinghouse for AP1000 NPPs. However, the government must still pass measures to move its plans along and indicate possible sites for the plant, something that is sure to arouse the opposition of residents in those areas.

- [Japan](#)

Shiho Kurota, AESJ Secretariat, sent the names of the new President and Vice Presidents of the Atomic Energy Society of Japan for 2010:

- President: Yonezo Tsujikura, The Federation of Electric Power Companies of Japan
- 3 Vice Presidents: (3 persons)
- Takashi Sawada, Nuclear Energy Systems Headquarters, Mitsubishi Heavy Industries, Ltd. (MHI)
- Hideo Hirayama, Applied Research Laboratory, High Energy Accelerator Research Organization (KEK)
- Satoru Tanaka, Department of Nuclear Engineering and Manager, Tokyo University

- [Latin American Section \(www.las-ans.org.br\)](http://www.las-ans.org.br)

[Jorge Spitalnik](#), Secretary of the LAS/ANS, reports that at the LAS/ANS Symposium in Rio de Janeiro, 21-25 June 2010, [Ambassador Marcos Castrioto de Azambuja](#) gave an important talk on the “Political Aspects of Non-Proliferation”.

[Ambassador Marcos C. de Azambuja](#), currently retired ambassador of the Ministry of Foreign Affairs of Brazil, is Vice-president of the Brazilian Council of International Affairs and Member of the Weapons of Mass Destruction Commission (WMDC)

associated to the Global Zero Initiative. He was General Secretary of the Ministry of Foreign Affairs of Brazil, Ambassador to France, Argentina and to the U.N. Conference on Disarmament, and President of the U.N. General Secretary Advisory Council for Disarmament Matters.

The following is a significantly edited text (with apologies, because of space limitations) of [Ambassador Marcos C. de Azambuja](#)'s talk:

“POLITICAL ASPECTS OF NON-PROLIFERATION

Historical Background: United Nations and Security

The political aspects of non-proliferation are many and critical. The UN Charter does rarely refer to disarmament because disarmament left bad memories between World Wars 1 and 2. Disarmament initiatives were blamed for by the fact that Western powers had not prepared themselves to confront the nazi-fascist threat. The word disarmament is seldom mentioned in the UN Charter –may be two or three times and incidentally. It is the idea of security that replaces it. The concept, which becomes dominant, is that nothing can be done unless there is certainty that the associated measures are effective. Therefore, concepts such as non-proliferation and disarmament have little space in the UN Charter.

As soon as the fact that nuclear energy for military purposes emerged, the only energy born under a military signature (electricity, coal, gas, and other forms of energy were born for peaceful purposes and only afterwards had military use), a new and inescapable international reality was created. Nuclear power appears essentially under its military patent, with an extraordinary impact, determining the accelerated collapse of the Japanese Empire and ending the war in the Pacific. The impact was such that soon after 1945, we began living in a new reality that was called the atomic age, and since the discovery of nuclear weapons, the political-military-diplomatic game has not been anymore the same because its equation did change. At the same time, a process was created whereby the permanent members of the Security Council were chosen, which also ended up by incorporating the countries holding nuclear weapons.

Non-Proliferation of Nuclear Weapons

The problem is that the first five nuclear powers realized that they could not restrain the access of other countries to nuclear knowledge. So, an instrument had to be devised to prevent - and then the word came up - the proliferation of nuclear weapons.

Formally, the Non-Proliferation Treaty would only be born in 1970, under the influence of two countries, the United States and the Soviet Union, which even today remain as members. To date, there are already 190 member countries. The Treaty presented two key aspects: the indication of the promise to contain the spread of nuclear weapons and the idea of inequality of treatment between those with the right to have nuclear weapons, and those who could not have them. Therefore, the Non-Proliferation Treaty was born under a very ambiguous political signature: on the one hand the idea that everyone's safety improves if there is no dissemination of nuclear weapons, and on the other hand, the crystallization of a situation among those who, at that moment, had nuclear weapons and those that did not have them. The problem created was to generate a permanent

discrimination among nations on the right to have nuclear weapons or not. The Non-Proliferation Treaty rests on three pillars: the pillar of disarmament, the pillar of non-proliferation, and the pillar of the peaceful use of nuclear energy. It is a treaty that aims at accelerating disarmament, preventing proliferation, and encouraging the peaceful use of nuclear energy.

The Treaty was initially created for a 25-year time period; it was thought that in 25 years, it would be possible to accomplish the three objectives of non-proliferation, disarmament, and peaceful use. However, when we came to the end of the initial 25 years, no progress had been made; proliferation went on, although much less pronounced than it would be had it not been for the Treaty. Today, it is assumed that without the Non-Proliferation Treaty, there would be between 25 and 30 nuclear powers. The fact is that there are 10.

One can celebrate, then, the success of the Non-Proliferation Treaty to have prevented till now 30 countries from becoming nuclear countries. The Treaty, therefore, worked to reduce the number of actors with nuclear weapons. It did not succeed to the extent that, within the period of its ruling, it did not avoid to have doubled the number of actors to 10 instead of keeping only five. It also failed on all that referred to article 6 which establishes the commitment of the nuclear power countries to work towards disarmament. Very little has been done though, especially after the end of the Cold War when a series of negotiations were conducted initially between the then Soviet Union and the United States, to reduce their nuclear arsenals and their warhead capabilities, and to reduce their strategic submarines and air forces. There is a certain progress, but much less than expected; what is gained in absolute numbers is offset by the capacity of precision of their control mechanisms. This reduction does not represent something showing a substantial progress on disarmament.

The third aspect of the peaceful uses remains a big problem because the International Atomic Energy Agency (IAEA) has always been a two-armed entity, one arm interested in control, surveillance, proliferation prevention, and the other interested in stimulating technology transfer. How to reconcile the need to promote technology with the need to monitor it?

On the other hand, nuclear energy has a beneficial peaceful magnitude to mankind which is the nuclear power generation and its uranium cycle. One cannot ignore that in a world where ecological concerns grow, the prestige of nuclear power has increased a great deal because of the rising perception of the need for non-polluting energy production, which will depend heavily on nuclear energy. I believe that nuclear energy will also have a big boost, considering what is happening nowadays in the Gulf of Mexico. More and more oil research and exploration in deep underwater does involve higher risks that come from nature itself or from the technology used. Searching for oil on the seabed at great depths of water layers, of land, or of salt, is a constant challenge embedding high accident risks. This will lead to a favorable reappraisal of nuclear power and its prospects.

In summary, a first consideration is that the Treaty on Non-Proliferation contains a central unfairness because it discriminates between countries that can have nuclear weapons, and others that cannot. This hurts a feeling that is very general, based on the concept of distributive justice and equality. On the other hand, nobody thinks we can live without the

Non-Proliferation Treaty, since the risk of other actors acquiring nuclear weapons would become very large with incremental risks to international security.

Conclusion

There is no non-proliferation without a political dimension. The Non-Proliferation Treaty is not a technical agreement: it is an agreement that assumes a stratification of international power among countries that hold nuclear energy for military purposes, and those that do not. This is something difficult to accept unless those that have the weapons work to eliminate them. Otherwise, it looks just like the crystallization of a society divided into two categories, and that is in the long term unacceptable.

I am a very vigorous advocate of the Non-Proliferation Treaty. It is necessary, but not sufficient; it is indispensable, but it is not enough; without it we would already have a disorder with about 30 countries with nuclear weapons.

If there were no real disarmament among the armed countries, one cannot rely only on the contention of unarmed countries to achieve proliferation prevention. Therefore, nuclear disarmament is one of the crucial issues of international life; it has been, for the first time, the subject of positive negotiations between Presidents Obama and Medvedev with numbers that look very promising, but somewhat deceitful because, though fewer weapons will be in existence, more effective, more precise and more deadly weapons will be at hand.”

- [México](#)

As of this writing, the Sociedad Nuclear Mexicana is about to welcome and host participants from around the Pacific Rim, and in fact from around the world, at the 17th Pacific Basin Nuclear Conference in Cancún, México, October 24-30, 2010. The theme of the Conference is “Nuclear Energy – An Environmentally Sound Option”. The conference website is <http://www.pbnc2010.org.mx>. PBNC covers all areas in the nuclear power industry, plus research and development activities directed to the application of nuclear energy.

- [OECD Nuclear Energy Agency \(http://www.nea.fr\)](http://www.nea.fr)

Gleaned from an OECD NEA press release dated 2010 August 20:

10th anniversary of the International School of Nuclear Law

Today, the OECD Nuclear Energy Agency (NEA) and the University of Montpellier 1 in France proudly celebrate the start of the 10th anniversary of the International School of Nuclear Law (ISNL).

The ISNL is a unique academic programme which, each summer, provides intensive teaching of virtually all aspects of international nuclear law. Over the past ten years, the ISNL has trained more than 500 participants who have come from around the world to take advantage of this unrivalled learning experience. In addition to post-graduate level students, ISNL alumni include experts representing both governmental

and non-governmental institutions, different nationalities and cultures, and different levels of age, education and work experience.

When the ISNL was established in 2000, there were no courses focused on nuclear law, despite the fact that national and international legal frameworks existed in all developed countries and in many developing nations. Indeed, nuclear energy activities are some of the most highly regulated of any industry both at the national and international levels. As a result, nuclear law practitioners, whether in the private, public or quasi-public sectors, must develop an in-depth knowledge of the broad range of legal instruments that comprise those regulatory frameworks.

Many countries have recognised the need to secure qualified human resources in nuclear disciplines especially given the growing interest in nuclear power; recent international, regional and national initiatives have been aiming at encouraging and facilitating greater numbers of students to enter the nuclear field. The ISNL remains, however, a distinctive educational programme.

On the occasion of the ISNL's anniversary, a special publication has been issued by the NEA: *International Nuclear Law: History, Evolution and Outlook*. It is dedicated to the ISNL alumni and free copies have been made available to nuclear lawyers, law schools, regional and international organisations and others working in the field of nuclear law. The book is a rich source of information comprising scholarly papers on the various aspects of international nuclear law, submitted by renowned experts in the nuclear field. The 18 papers, based on current lectures, cover a wide variety of subjects, including institutional aspects, radiological protection, nuclear safety, security, safeguards, transport, trade, liability, insurance, environmental protection as well as the history of the school.

The NEA addresses a broad range of nuclear activities and its expertise in nuclear law is widely recognised. It produces on a semi-annual basis the *Nuclear Law Bulletin*, a periodical designed to provide both its professional and academic subscribers with authoritative and comprehensive information on nuclear law developments the world over.

- [Pacific Nuclear Council \(http://www.pacificnuclear.net/pnc/\)](http://www.pacificnuclear.net/pnc/)

As of this writing, excitement mounts at The Pacific Nuclear Council as the start of the 17th Pacific Basin Nuclear Conference nears, to be hosted in Cancún by the Sociedad Nuclear Mexicana.

- [Slovenia \(http://www.djs.si/indexen.html\)](http://www.djs.si/indexen.html)

[Dr. Boštjan Koncar](#), Past President of the Nuclear Society of Slovenia (NSS), reported that since 2010 May the NSS has a new [President, Dr. Marko Čepin](#), [University Professor at University of Ljubljana](#).

And [Prof. Čepin](#) sent the following report

The Nuclear Society of Slovenia organized an International Meeting on Nuclear

Energy in New Europe in Portorož, 2010 September 6-9, <http://www.djs.si/port2010/>. 160 participants from 22 countries and from the International Atomic Energy Agency discussed the fields of nuclear physics and fusion, nuclear waste, nuclear safety, operation of existing and new plants.

Under [Prof. Dr. Marko Čepin](#), the preparations for the 2011 Annual Conference have started. In 2011, the 20th anniversary of the Nuclear Society of Slovenia will be celebrated and the 20th International Conference “Nuclear Energy in New Europe”, will take place in Bovec, 2011 September 12-15 (<http://www.nss.si/nene2011/>). In the same year, thirty years of operation of Nuclear Power Plant Krsko will be remembered. NPP Krsko is a Slovenian nuclear power plant. It produces more than 40% of the country’s electricity, and boasts excellent safety and operational indicators, including a lifetime energy availability factor of 83.8%.

- [Spain:](#) 

[Prof. Diana Cuervo](#), of the Sociedad Nuclear Española, sends SNE news:

The **Spanish Nuclear Society** will organize its **36th Annual Meeting** in Santiago de Compostela, the capital of the province of Galicia, from 6 to 8 October. The meeting will provide professionals and companies representing the nuclear industry with a focal point for analyzing - in this beautiful city - the current situation and future prospects for nuclear energy. All the relevant information about the meeting is available at: www.reunionanualsne.es.

The **SNE Annual Technical Session** was organized at Tecnatom, on June 9, with a large attendance of professionals and SNE members. The session was devoted to the management of safety-related equipment and components.

Barcelona played host to the **European Nuclear Conference (ENC 2010)** from 29 May to 2 June. It was organised in collaboration with the Spanish Nuclear Society and FORATOM. At the meeting you could find the main companies and representatives of the global nuclear industry present, although it was the first time that this conference had taken place in Spain. This meeting was a focal point for the main experts in the field. The programme helped people to share experiences with one another thanks to the 500 presentations, meetings and working sessions devoted to such subjects as advanced reactors, nuclear global development, nuclear safety and waste management, etc.

In parallel, a commercial exhibition took place in which the main companies and organisations active in the nuclear industry presented their work to an international market. The Spanish companies Empresarios Agrupados, Endesa, Ensa, Enusa, Gas Natural Fenosa, Grupo Dominguis, Iberdrola, Tecnatom and Técnicas Reunidas participated together in the Spanish pavilion, coordinated by the Spanish Nuclear Industry Forum. It was one of the most popular ones visited by the 1000 people who were in Barcelona’s Congress Palace of Catalonia, the venue for ENC2010.



The **SNE and ICAI University**, via the Rafael Mariño Chair, organized a **Nuclear Session** intended principally for professionals, academics and senior students studying engineering or science interested in having an updated view of the nuclear power sector. In these periodical sessions, the key aspects of this technology are reviewed, with the aim of showing its current state, developments, trends and prospects in order to provide objective and rigorous information about the sector. This year the Session was devoted to “2010: Nuclear Fuel Cycle: from the Mine to the Future”. Lourdes Guzman (ENUSA) presented “The First Part of the Cycle: from Mining to Reactor”, Juan Enrique Martínez Abad (ENRESA) presented “The Second Part of the cycle: the Spent Fuel as Waste”, and Enrique Gonzalez (CIEMAT) presented “Other Sequels: the Spent Fuel as a Resource”.

The 15^a edition of the **Nuclear MaxiMarathon** organized by the World Council of Nuclear Workers (WONUC) was held in Spain on 18-24 September 2010. It went from Garoña NPP to Madrid, via Burgos. When finalizing the marathon steps, the participants delivered to the Industry Ministry a manifest against the government’s decision to close the Garoña NPP in 2013, a decision that did not take into account the report submitted by the Spanish Nuclear Safety Council, which agreed that the Garoña plant could continue operating for ten more years beyond its original 40-years lifetime until 2019, as requested by the operator, Nuclenor.

The Spanish government is expected to communicate in few days the location selected to hold the **Centralised Temporary Storage facility** in Spain. Nine candidates were presented to hold the facility, after which the government must choose the best option.

The Centralised Temporary Storage facility is an installation designed to house the spent fuel from the nuclear power plants and the high level wastes produced in Spain (total material to be stored 12,816 m³) at a single location. The facility does not generate energy and produces no contamination.

The facility will be built above ground and will house these materials under dry conditions for a period of 60 years by means of a system of modular spaces. The processes required for the interim management of all the high level radioactive wastes will be centralized at this facility. For more information about this topic visit www.enresa.es/actividades_y_proyectos.

- [World Nuclear University \(WNU\)](#)

The World Nuclear University (WNU) held its 6th Annual WNU Summer Institute at the University of Oxford for six weeks, from 3 July to 14 August.

Each year the Institute selects approximately 100 WNU Fellows from some 35 countries. These young, nuclear professionals are tutored by some of the world's notable experts in the field and will receive instruction in a broad range of issues, including nuclear energy, team-building and leadership.

News from ANS Divisions

To further the implementation of the Joint Protocol between the IC and the Professional Divisions Committee, we are pleased to include in the Globe some newsworthy Division items. While some items can be gleaned from the Divisions' web pages, please send us your most up-to-date and timely news to post in the *ANS Globe!*

- [Decommissioning, Decontamination & Reutilization Division \(DDR\)](#)
(<http://ddrd.ans.org>)

DDR 2010 TOPICAL MEETING

The ANS DDR 2010 Topical Meeting was held in Idaho Falls, Idaho USA from August 29 to September 2, 2010. This meeting under the leadership of the DD&R Division of ANS and Jim Byrne who served as the Technical Program Chair was a forum for the discussion of the social, regulatory, scientific, and technical aspects of nuclear facility decommissioning and radioactive waste management. The conference program included technical sessions providing commercial, government, and international project updates as well as present projects and various aspects of those activities relating to their management, technology, and regulatory developments.

There were 115 technical papers presented in 16 sessions at the meeting. The papers, which were from five continents, were presented in three tracks:

- “Clearing the Way” – Project status reports
- “Clearing the Way Made Easier” – Lessons learned, project management issues, regulations, and technologies
- “After Clearing the Way” – Legacy management and site reuse after completion of decommissioning activities

In addition to a comprehensive technical program, there was a vendors' exposition of technical wares and other commodities, technical tours, and numerous fun activities and networking opportunities for attendees and guests. The DD&R Division would like to thank the 14 professional societies that co-sponsored the ANS Topical DDR

2010 Meeting. These are listed below (in no particular order):

The International Atomic Energy Agency, the OECD Nuclear Energy Agency, the European Nuclear Society, the Slovak Nuclear Society, the Hungarian Nuclear Society, the Czech Nuclear Society, the French Atomic Commission, the French Nuclear Society, the UK's Nuclear Institute, the Romanian Nuclear Energy Association, the Mexican Nuclear Society, the Canadian Nuclear Society, the Chinese Nuclear Society and the Atomic Energy Society of Japan.

Our website at <http://ddrd.ans.org> provides current of information on the activities of the DD&R Division, including upcoming meetings.

- [Reactor Physics Division \(RPD\) \(http://rpd.ans.org\)](http://rpd.ans.org)

RPD is looking forward to its next Topical Meeting on the Physics of Reactors, scheduled for 2012. PHYSOR 2012 will be held in Knoxville, TN, USA, with the theme “Advances in Reactor Physics – Linking Research, Industry, and Education”. The Organizing Committee has already begun the planning and preparations.

- [Thermal Hydraulics Division \(THD\) \(http://thd.ans.org\)](http://thd.ans.org)



Canada is the hosting country for the 14th International Topical Meeting on Nuclear Reactor Thermal hydraulics (NURETH-14). NURETH is an important series of major international topical meetings devoted solely to the advancement of knowledge in the nuclear reactor thermal hydraulics and related areas. It covers wide range of topics assumed in the different types of nuclear reactors of current and future generations. NURETH-14 will be held in beautiful Toronto, Ontario, Canada, from September 25 to 29, 2011, and is organized in cooperation with the Canadian Nuclear Society, along with many co-sponsoring organizations from international nuclear community. NURETH-14 is a unique opportunity for researchers and practitioners

in the field to present results of their work and discuss challenges and new ideas. The theme of NURETH-14 is “Helping the Environment with Advances in Thermal hydraulics”. The Conference website URL is <http://cns-snc.ca/events/nureth-14/>. There is a lot of enthusiasm amongst the NURETH-14 organizers that the program will appeal to engineers, scientists and all professionals working in nuclear power.

Highlights from the 2010 June Meeting in San Diego, CA

Chair Brès-Tutino introduced [Dr. Zheng Minguang](#), President of SNERDI (Shanghai Nuclear Engineering Research & Design Institute). [Dr. Zheng Minguang](#) is the Chief designer of one of the Chinese national key projects “Large Advanced PWR”. SNERDI, the pioneer of Chinese commercial NPP development, was founded on February 8, 1970 and has developed the first Chinese indigenous NPP (Qinshan, 310MW) and the first exported NPP (Pakistan 325MW), as well as the Qinshan phase III project of technical support and engineering construction management tasks. [Dr. Zheng](#) made a presentation entitled “A Study on Chinese Nuclear Power Development”. This presentation is reproduced below.



Study on Chinese Nuclear Power Development

Dr. Zheng Minguang
President

Shanghai Nuclear Engineering Research & Design Institute

June 2010, San Diego



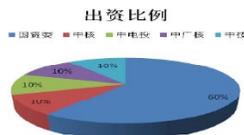
CONTENT

1. Overview of SNPTC and SNERDI
2. Outlook of China's Electricity Demand
3. China's Electricity Structure
4. Policy on Nuclear Power
5. Prediction of Chinese Nuclear Power Development



Overview of SNPTC

- State Nuclear Power Technology Corporation Ltd. (SNPTC), founded in May 22nd 2007, is a key State-owned Corporation established with investment from the State Council and the 4 large State-owned Corporation(CNNC, CPI, CGNPC, CNTIC). Its business scope includes nuclear power R&D, design, equipment manufacturing, engineering and project management and maintenance services, LPP demonstration plant construction and operation, etc.



Overview of SNERDI

- SNERDI is one of the subsidiary of SNPTC, was established on Feb. 8, 1970. SNERDI aims on the research and design of NPP, and provides the technical service for operation NPP.
- The first NPP in mainland of China, and the first exported NPP of China was self-designed by SNERDI.
- Now SNERDI is cooperating with Westinghouse and SHAW Group in the design of Chinese Self-Reliance Supporting Project of AP1000. SNERDI also starts the follow up AP1000 project both inland and coast as well as state key projects.



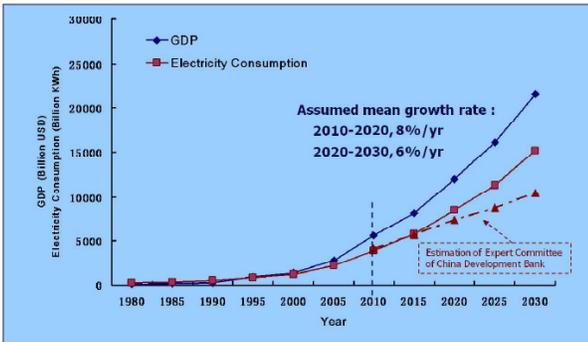
Qinshan Phase I

Sanmen NPP

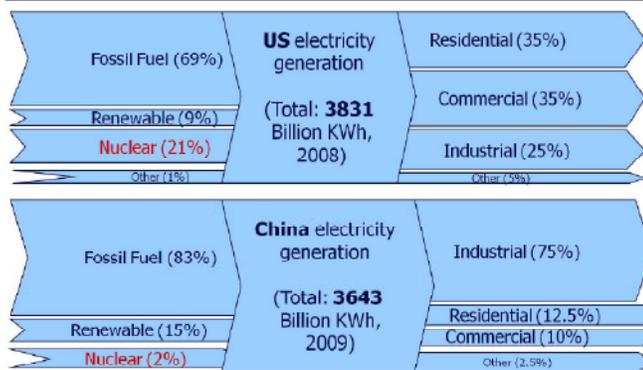
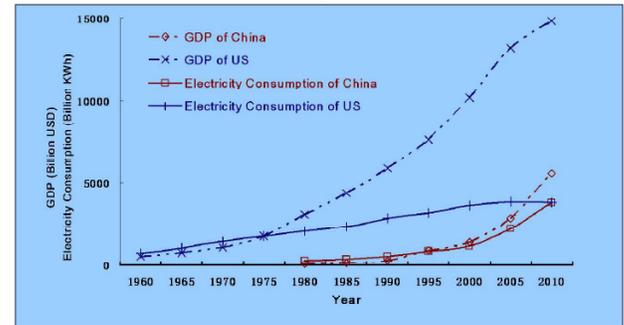
AP1000 & CAP1400



1. Growth of China's GDP & Electricity Consumption



1. China vs. US GDP & Electricity (1960~2010)



- ✓ Chinese government has declared to reduce the **CO2 emissions of unit GDP by 40 to 45%**, and the consumption of **non-fossil-fuel power account for 15%** of the total primary energy consumption by 2020. (Copenhagen)
 - Energy both production and consumption Structure Adjustment
 - Increasing Renewable and Nuclear Energy ratio
- ✓ Government perspective on nuclear energy: from “Moderate development” to “Actively promoting”. China's Development Plan of Nuclear Power Industry: “Mid - Long Term Development Plan for Nuclear Power(2005-2020)” : **40GW (in operation) & 18GW (under construction) by 2020**
- ✓ National Energy Association Secretary said: ... need **maximize the ability** to construct more NPPs, ...the development will be **first lower and later higher**, ... It will be **striding development** for Nuclear Industry.
- ✓ Personnel positive estimation: **over 80GW (in operation) + over 20GW (in construction) Total above 100GW by 2020**



- ✓ **Ambitious Nuclear Power Plan Promoting Industries**
 - Nuclear power **politically and financially supported** by central and local Government. **Local government promoting**: because it is helpful for local economic stimulus and mitigating local electricity shortage as well as for the future development
 - **Recombination and integration** of existing industries, organization and human resource for nuclear energy development:
 - ⇒ **Enlarge equipment Localized production capability—3 big base**
 - ⇒ Increase qualified utilities for operation of NPPs
 - ⇒ Enhance the nuclear safety review and licensing capability
 - ⇒ Establish a complete nuclear industry standard system
 - **New tech R & D investment**:
 - ⇒ Establish or renew state research center on nuclear energy
 - ⇒ Set up national major project on large NPPs, such Advanced Large PWR and High Temperature Gas Reactor

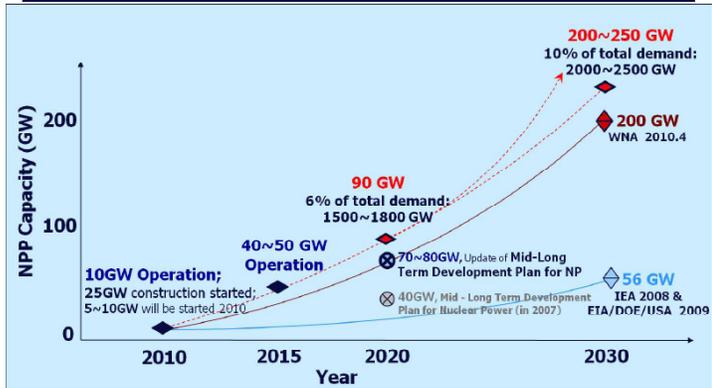


- ✓ **Main factors promoting nuclear Power development**
 - **Electricity Demand Analysis**
 - ⇒ Process of Industrialization--Economic - Industries growth
 - ⇒ The Rush to Cities or town progress(peasants turning to residents)
 - **Resource and Environment Pressure**
 - ⇒ Chinese average resource very limited in many aspects
 - ⇒ Solutions to environment protection against the increasing Pollution
 - **Policy**
 - ⇒ Promoted and supported by government as national policy
 - **Negative Restraints**
 - ⇒ Uranium Resource
 - ⇒ Qualified Human Resource
 - ⇒ High Quality Equipment Production
 - ⇒ Others...

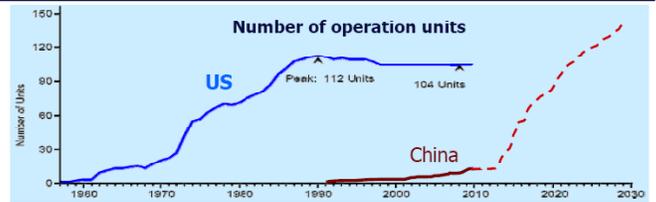




Prediction of Chinese Nuclear Power Development



Prediction of Chinese Nuclear Power Development



- 2010-2015: Generation II*PWR, Supportive and follow AP1000, EPR (~30Units will be operated); Industries Promoting R&D
- 2015-2020: Standardized AP1000 or AP1000*(~30Units); Demonstration of LPP such as CAP1400; R&D
- 2020-2030: AP1000+, CAP1400, CAP1700; Demonstration of Generation IV or quasi V possibly TP series.

Chair Brès-Tutino then introduced [Dr. Franklin Erepano Osaisai](#), Director-General/Chief Executive Officer of the Nigeria Atomic Energy Commission (NAEC). [Dr. Osaisai](#) is a Nuclear Engineering Scientist by professional training, and is a professional career academic with research interests and publications in the areas of Reactor Engineering, Numerical Modeling and Energy Systems Integration. Until his appointment in 2006 as the pioneer Director-General of the Nigeria Atomic Energy Commission NAEC), [Dr. Osaisai](#) was the Director of the Nuclear Technology Centre at the Sheda Science and Technology Complex, Abuja. He is a Fellow of the Nigerian Society of Engineers and the Science Association of Nigeria. By virtue of his position as Director-General/CEO of NAEC, [Dr. Osaisai](#) is directly responsible for the coordination of the formulation and implementation of the national nuclear power programme. [Dr. Osaisai](#) made a presentation on “Planning and Implementation of Nigeria’s NP Programme – An Update”. This presentation is reproduced herein.




PLANNING AND IMPLEMENTATION OF NIGERIA'S NP PROGRAMME: AN UPDATE

Dr. F. Erepano Osaisai
 Director-General/CEO
 Nigeria Atomic Energy Commission

June 13, 2010.

DISCUSSION OUTLINE

- i. The Basis for Adopting the NP Option
- ii. Starting an NPP Programme: The Fundamentals
 - a. Relevant National Institutional Framework
 - b. The National Nuclear Energy Programme Implementation Committee
- iii. The National Nuclear Power Roadmap
 - a. Human Resource development
 - b. Preliminary siting activities
 - c. Development of NPP Legal Framework
 - d. Reactor Technology Selection
 - e. Public Acceptance and Communication
 - f. National Infrastructure and Industrial capacity Development
- iv. The Progress so far made
- v. The Challenges we Face
- vi. Concluding Remarks

June 13, 2010 F.E. Osaisai: Plan'g and Implementing of NPP in Nigeria: An Update 2

DISCUSSION OUTLINE

- i. The Basis for Adopting the NP Option
- ii. Starting an NPP Programme: The Fundamentals
 - a. Relevant National Institutional Framework
 - b. The National Nuclear Energy Programme Implementation Committee
- iii. The National Nuclear Power Roadmap
 - a. Human Resource development
 - b. Preliminary siting activities
 - c. Development of NPP Legal Framework
 - d. Reactor Technology Selection
 - e. Public Acceptance and Communication
 - f. National Infrastructure and Industrial capacity Development
- iv. The Progress so far made
- v. The Challenges we Face
- vi. Concluding Remarks

June 13, 2010

F E Osaisi: Plan'g and Implementing of NPP in Nigeria: An Update

2

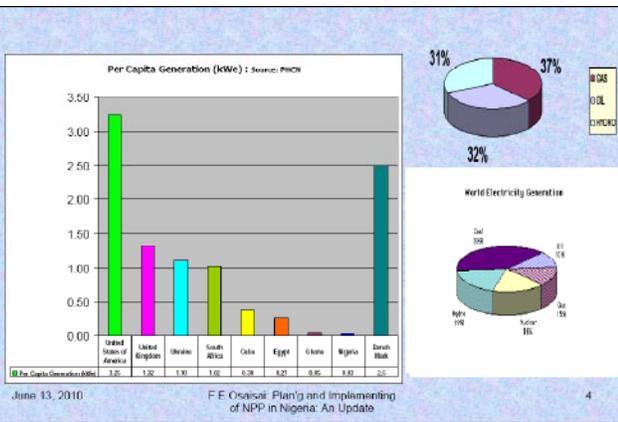
I. THE BASIS FOR ADOPTING THE NP OPTION.

- ❖ The current total installed grid capacity of 6,000MWe, mainly of gas, oil and hydro in the percentage ratio of 37/32/31, with availability of less than 4,000MWe, is grossly inadequate for a country with a population of 150 million.
- ❖ Several new power projects through the National Integrated Power Projects (NIPP) programme are being implemented and expected to deliver 3,000MWe within two years, and expansion of the transmission network is underway.
- ❖ Long-term national energy security is imperative for sustainable development in any country.
- ❖ Long-term dependence on fossil fuels, non sustainable; and there are physical and technical limitations to the harnessing of hydropower.
- ❖ Resource exploitation should embody conservation in harmony with the environment. These effectively are key elements and indicators for effective development planning for sustainability.
- ❖ Planning for long-term energy security should address issues of global warming and climate change and entail optimization of the available energy mix.
- ❖ NP programme aimed at sustainable socioeconomic development, preservation of the environment with access to a diversified basket of energy options

June 13, 2010

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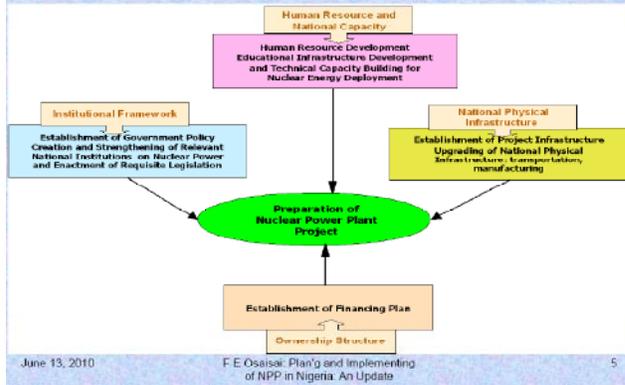


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4

II: STARTING AN NPP PROGRAMME: THE FUNDAMENTALS



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5

A: RELEVANT NATIONAL INSTITUTIONAL FRAMEWORK

- ❖ The Minister of Science and Technology has the institutional mandate for the development and application of nuclear energy in Nigeria.
- ❖ The Nigeria Atomic Energy Commission (NAEC), established by Act 46 of 1976 and became operational in July, 2006 is the National Focal Point for the promotion and development of atomic energy.
- ❖ Five nuclear energy research centres operate under the supervision of NAEC; involved in manpower training and capacity building; four are university-based, and fifth at the national centre in Sheda-Abuja.
- ❖ The Nigerian Nuclear Regulatory Authority (NNRA) is national regulator and licensing authority; established by Act 19 of 1995, became operational in 2001. Empowered to develop and enforce all regulations that would govern the operations of the nuclear power industry.
- ❖ Other relevant national agencies also play their roles. These include the Energy Commission of Nigeria (ECN) with responsibility for energy policy and planning; National Electricity Regulatory Commission (NERC) for electricity pricing; National Environmental Standards and Regulations Enforcement Agency (NESRA); etc

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6

B: THE NATIONAL NUCLEAR ENERGY PROGRAMME IMPLEMENTATION COMMITTEE (NEPIC)

Notwithstanding the designation of NAEC as NEPIO and focal point:

- The sustainable and successful implementation of the programme entails full participation of several other national stakeholder institutions.
- These agencies and institutions constitute the Nuclear Energy Programme Implementation Committee (NEPIC).
- Each of these institutions performs specific roles in conformity with their designated national mandates.
- NAEC plays the central role of coordinating the inputs from each of these organizations to ensure synergy.

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III: THE NATIONAL NUCLEAR POWER ROADMAP

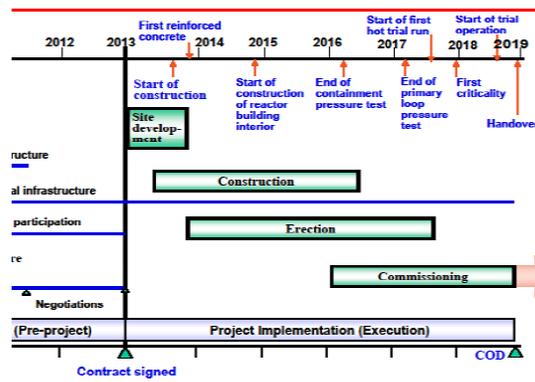
- ❖ The Roadmap, tagged the "Technical Framework for the Deployment of Nuclear Power Plants for Electricity Generation in Nigeria" and its "Strategic Implementation Plan" have been developed and approved by the Federal Government for implementation:
- ❖ The technical framework is three-phase plan which is aimed at positioning Nigeria to generate electricity from NPPs in 10 to 12 years with considerable national participation.
- ❖ The various phases are:
 - Manpower and infrastructure development;
 - Design certification, regulatory and licensing approvals; and
 - Construction and start-up.

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10

Project Key Milestones



A: HUMAN RESOURCES DEVELOPMENT

The manpower development objectives of the nuclear power roadmap entails training of specialized professionals in the core and allied fields to:

- ❖ Acquire fundamental understanding in technology and project management for the planning, coordination and sustainable implementation of the national nuclear power programme;
- ❖ Acquire needed skills for operation and maintenance of NPPs;
- ❖ Develop capacity for gradual local participation in the nuclear power industry; and
- ❖ Develop capacity for full utilization of nuclear technology for other peaceful socioeconomic endeavours, such as in *human health, food security and agriculture, water resources management, industry, mineral exploration and environmental monitoring, among others.*

HUMAN RESOURCES DEVELOPMENT (2)

The HR development strategy entails a multi-pronged approach which include:

- formal education in universities and polytechnics;
- on-the-job training;
- facility-specific-training provided by reactor vendor organizations;
- direct participation during project implementation and partnerships with experienced power utility organizations for initial operation of power plants, among others.

Initial actions taken to achieve objectives include:

- Strengthening and positioning local institutions for training of nuclear engineers, scientists and technicians. NAEC has entered into MOUs with several national universities and polytechnics to develop appropriate curricula and introduce programmes.
- Cooperation and partnership with off-shore institutions to train graduate nuclear scientists and engineers as potential faculty for the implementation of the training programmes in the local institutions.

HUMAN RESOURCES DEVELOPMENT (3)

The HR development strategy also entail:

- Development of physical educational infrastructure in designated institutions and provision of centralized relevant research facilities at the five national nuclear energy research centres for training and capacity building
- Training through bilateral cooperation and institutional linkages with offshore institutions.
- Development of partnership with international agencies and provide specialized training through fellowships in the field.
- Vendor/facility-specific training during design, construction, installation and commissioning of plants and equipment.

B: PRELIMINARY SITE SELECTION ACTIVITIES

❖ Currently, some preliminary work on siting is on-going. A Siting Project Team has been activated. Ten sub-project teams have been created and mandated to carry out specified activities in the designated probable sites. These include:

- Seismic and Geotechnical ,
- Meteorology and Climatology ,
- Hydrogeology and Hydrology ,
- Topography and Demography ,
- Radioactivity and Ecology ,
- Environment ,
- Safety and Security ,
- Quality Assurance ,
- National Electric Grid, and
- Accessibility.

❖ Various field visits have been carried out and specific characterization made to obtain relevant preliminary data.

PRELIMINARY SITE SELECTION ACTIVITIES (3)

Following site survey and site evaluation exercises embarked upon by the Commission, four sites have been designated for further detailed characterization and recommendation to government. The sites are located in the areas around:

- ✓ Geregu/Ajaokuta Local Government Area of Kogi State in the North Central Zone of the country.
- ✓ Itu Local Government Area of Akwa Ibom State in the South-South Zone.
- Agbaje, Okitipupa Local Government Area of Ondo State in the South West Zone.
- Lau Local Government Area of Taraba State in the North-East Zone.

In the preliminary site survey and evaluation project, a number of technical, environmental, security, social and economic issues were investigated as shown in the chart of activities in the figure below. It is desirable that sites recommended for consideration should accommodate multiple NPP units.

C: DEVELOPING THE NPP LEGAL FRAMEWORK

A number of processes have been activated for the enactment of a comprehensive legislation needed for the successful implementation of the programme in a sustainable fashion. Elements considered in the legal framework include:

- nuclear security,
- radioactive materials and radiation,
- nuclear liability,
- radioactive waste management,
- spent fuel and decommissioning,
- environmental protection,
- emergency notification of nuclear incidents,
- foreign investment, and
- safety of nuclear installations, among others.

❖ It would also entail domestication of some treaties, conventions and statutes.

DEVELOPING THE NPP LEGAL FRAMEWORK (2)

- ❖ A draft law for the implementation of the national nuclear power programme has been developed, and has been subjected to detailed scrutiny by all major stakeholders with technical input of the IAEA. Expected to be submitted to the National Assembly by the third quarter of 2010.
- ❖ The NNRA law is being revised and modified to adequately equip the regulator to effectively deal with regulation and licensing of nuclear power plants.
- ❖ A draft regulation on the *Safety and Regulatory Requirements for Licensing of Sites for Nuclear Power Plants* is being developed by the NNRA.
- ❖ A National Policy on Radioactive Waste Management is being developed by NAEC in consultation with the NNRA and other stakeholder institutions.
- ❖ A National Policy on NPP Civil Liability and Insurance is also being developed.
- ❖ Government's positive disposition to ratify and domesticate all other relevant international statutes, treaties and convention is unwavering.

DEVELOPING THE LEGAL FRAMEWORK (3)

INTERNATIONAL AND MULTILATERAL TREATIES AND OBLIGATIONS

Nigeria has ratified the following international treaties:

- ◆ Treaty on Non-Proliferation of Nuclear Weapons (In force)
- ◆ Convention on Early Notification of a Nuclear Accident (In force)
- ◆ The Treaty of Pelindaba on the African Nuclear-Weapon-Free zone (In force)
- ◆ African Regional Co-operative Agreement for research, Development and Training related to nuclear science and technology (AFRA) (Third Convention) (In force)
- ◆ Comprehensive Safeguards Agreement in Connection with the Treaty on Non-Proliferation of Nuclear Weapons (In force)
- ◆ Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (In force)
- ◆ Additional Protocol to the NPT (In force)
- ◆ Convention on Nuclear Safety (In force)
- ◆ Convention on Physical Protection of Nuclear Material (as amended in 2005) (In force)
- ◆ Joint Convention on Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (In force)
- ◆ Vienna Convention on Civil Liability for Nuclear Damage (In force)
- ◆ Joint protocol relating to the application of the Vienna Convention and the Paris Convention (In force, yet to accede)
- ◆ Agreement on the Privileges and Immunities of the IAEA (In force)

D: REACTOR TECHNOLOGY SELECTION

- ❖ As an emerging economy with limited infrastructure, Nigeria would only adopt an established nuclear power technology with a good track record and operational experience.
- ❖ Such a technology should be reasonably standardized, amenable to easy maintenance, with clearly defined vendor support programmes and suitability for eventual domestication.
- ❖ Actions taken:
 - For the purpose of selecting an appropriate nuclear technology for the first NPP, the following procedure has been adopted:
 - A technical committee was tasked to select an initial nuclear power technology for the first NPP, and the committee has submitted its report; and
 - The report of the committee is being reviewed and subjected to further scrutiny. It is expected a recommendation will be made for government's approval.

E: PUBLIC ACCEPTANCE OF NPP DEVELOPMENT

- ❖ Public acceptance of nuclear energy is a critical factor that is being addressed from the outset. A broad-based national consensus is desirable.
- ❖ Government functionaries, Legislators, Labour and the Civil Society are all important stakeholders in this endeavour, and are being engaged to claim ownership of the programme.
- ❖ A significant level of latent resistance usually confronts the introduction of nuclear technology in developing societies. This arises mainly from a number of factors, chiefly among which are:
 - possible conflicts with the economic interests of existing technologies and the element of social inertia towards innovation;
 - lack of adequate information on the societal benefits and the relative economic competitiveness of nuclear technology;
 - global considerations such as environmental implications and other sundry special interests and imaginary concerns;
 - the exaggerated risks associated with the introduction of nuclear power; and
 - Issue of nuclear waste management.

PUBLIC ACCEPTANCE OF NPP DEVT (2)

Ensuring the success and long-term sustainability of a nuclear power programme would require breaking the barriers presented by these elements of resistance. This comes with some social and economic costs, and possible delay in project implementation schedules.

NAEC is developing appropriate ways and means of communicating effectively with the public and prepare their minds to be more receptive to the introduction of nuclear power in the country. The major issues for communication include:

- The economic advantage of generating electricity from NPPs vis-à-vis other sources and the relative environment-friendliness of nuclear power plants compared to fossil fired plants.
- Factual and concise appreciation and presentation of the relative risks entailed in the utilization of nuclear technology vis-à-vis other competing technologies.
- Proper assessment of various accident/emergency scenarios in relation to inherent safety features of NPP and our technical preparedness to manage situations, as well as the national plans for nuclear waste management.

Working with the relevant agencies and media houses, NAEC is developing documentary films, convening of Town Hall Meetings, and the production of Information Bulletins and Pamphlets on the benefits of the national NP programme.

VI: PROGRESS MADE SO FAR

National Nuclear Power Roadmap has been developed and approved by the Federal Government for implementation. The roadmap envisages NPP operation by 2020.

The National Strategic Plan for the implementation of the NP programme has been developed and finalized with input from all relevant national stakeholder institutions, as well as technical guidance from the IAEA.

The NPP project implementation, by IAEA assessment methodology, has attained milestone one.

The management framework for the implementation of the National Nuclear Energy Programme has been streamlined.

Manpower development activities are fully on course; institutions have been designated and various curricula developed for the commencement of training programmes in nuclear science and engineering;

Site selection activities are progressing in a structured manner;

A finalized draft Legal Framework developed in partnership all relevant national stakeholder institutions and with technical input from the IAEA will be presented to the National Assembly for enactment.

VI: CONCLUDING REMARKS

The Federal Government of Nigeria has activated a nuclear power programme, and had approved the roadmap for its implementation;

The National Strategy for the implementation of the approved NP programme has been finalized with the assistance of the IAEA and it is envisaged that its meticulous implementation will achieve NPP operation by year 2020;

The requisite structure for the prosecution of the national nuclear power programme are being put in place by the Nigeria Atomic Energy Commission in partnership with other stakeholder institutions and international development partners;

Government has shown commitment by taking on the responsibility for infrastructure and manpower development to create the requisite enabling environment for the successful implementation of the programme in partnership with the private sector;

F: NATIONAL INFRASTRUCTURE AND INDUSTRIAL CAPACITY DEVELOPMENT

The infrastructure development would entail:

- strengthening and updating of training and capacity-building facilities;
- gradual development of pertinent industrial competencies, engaging the local heavy industry, such as the iron and steel industry, the cement and allied industry as partners, to become active participants in the NP programme;
- gradual development of professional skills for local participation in the NP industry; and
- Sensitizing government to upgrade the requisite transportation capabilities to facilitate the movement of heavy equipment needed for an NP programme, among others.

Industrial capacity upgrading through:

- Survey and determine available industrial capacity in the country, identifying possible developmental needs and recommend strategies to achieve this within a given time frame;
- Gradually achieve competencies in local industrial capacity and enhance local content in the execution of nuclear power projects.

V: THE CHALLENGES WE FACE

Long-term national (political) commitment to, and sustainability of programme over gestation period of at least 20 years;

Training of requisite restrictive manpower and long lead- time required to build critical mass;

Development of appropriate infrastructure needed to support the implementation of the programme;

Development of requisite industrial capacity to gradually domesticate nuclear technology;

Development of the requisite financing plan, catalyzed by government, with the private sector as a partner; and

Motivating and sustaining the interest of the Nigerian Public and develop a positive attitude in the country, while maintaining the confidence of our partners.

CONCLUDING REMARKS (2)

Noting that availability of qualified manpower is the most important and critical factor that will guarantee success and sustainability in the implementation of the programme, educational programmes and facilities are being developed to grow the needed human resource base;

The industrial sector is being engaged and challenged to brace up for effective participation in the programme;

An enabling environment is being created to sensitize the financial and investing community see business opportunities in the national long-term to nuclear power development; and

Implementation of various components of the programme is on course including preliminary siting activities.

Chair Brès-Tutino then introduced the third speaker, [Dr. Stefano Monti](#), Director of the ENEA Section dealing with the new Italian nuclear programs, responsible for the agreement of ENEA with the Minister of Economic Development.

(ENEA is the Italian National Agency for New Technologies, Energy and Sustainable Economic Development.)

[Dr. Monti](#) made a presentation on the “Italian Strategy on Nuclear Fission”, reproduced below.



Content

- Italian strategic energy policy
- New legal framework supporting nuclear energy
- Main R&D activities

ENEA AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

American Nuclear Society's International Committee Meeting
San Diego, CA - 13 June 2010

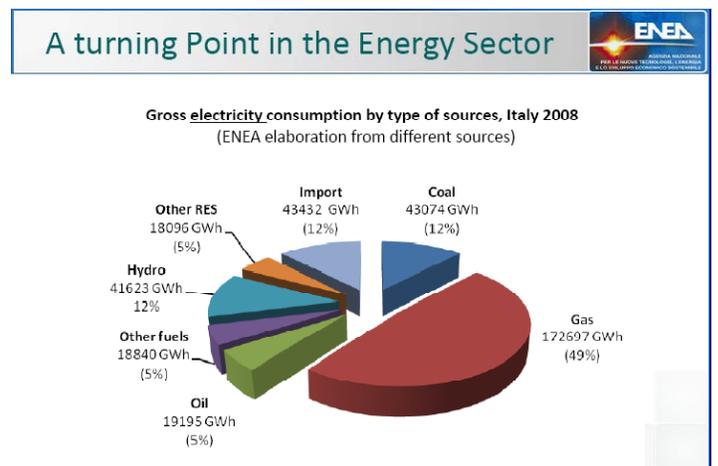
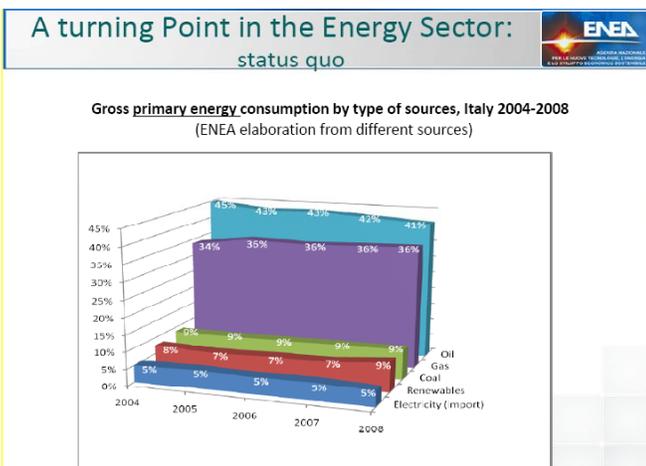
ITALIAN STRATEGY ON NUCLEAR FISSION

Stefano Monti
ENEA
Italian National Agency for New Technologies, Energy and the Sustainable Economic Development

ENEA AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

Content

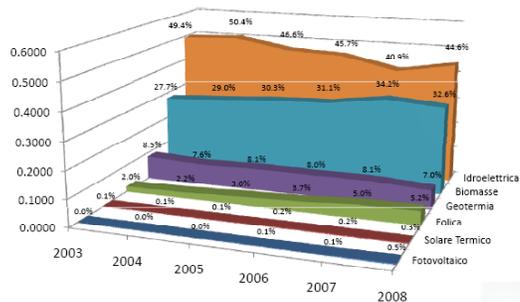
- Italian strategic energy policy
- New legal framework supporting nuclear energy
- Main R&D activities



A turning Point in the Energy Sector



Energy from renewables energy sources, Italy 2003-2008
(ENEA elaboration from different sources)



Italian Nuclear Energy Policy



In 2008 the electricity demand has been 350 TWh/y and is expected to increase up to about 400 TWh/y in 2030
25% from Nuclear means 100 TWh/y



13,000 MWe \Rightarrow 8 EPR or 12 AP1000

NEW ITALIAN ENERGY POLICY



Italian energy policy assumes diversification of the energy portfolio aimed to reduce dependence on fossil fuels and electricity import by 2030

RENEWABLES		25%
NUCLEAR (fission)		25%
FOSSIL		50%

Renaissance of nuclear energy in Italy: Italian Energy Strategy



- A concrete step in the direction of the planned energy mix \rightarrow Bilateral Agreement for the Cooperation in Nuclear Sector between the Governments of Italy and France, signed on 29 February 2009.
- In parallel Enel and EdF signed an Agreement for the Joint Development of a Nuclear Program in Italy. Four EPR units (6,400 MW) are planned to be built and operate as from 2020. A Joint Venture (50/50), the *Società Sviluppo Nucleare Italia S.r.l.* has been created on 31 July 2009 with the objective to perform NPP feasibility studies for the Italian sites that will be proposed.
- As a follow-up of the IT-FR Bilateral Agreement ENEA and CEA stipulated an Agreement in the Field of Nuclear Fission Research (Gen IV, Advanced Fuel Cycles).

Renaissance of nuclear energy in Italy: Italian Energy Strategy



- A Memorandum of Cooperation has been stipulated on 24 May 2009 between Italy and **Japan** for the Nuclear Power Development in Italy.
- A Cooperation Agreement has been stipulated on 29 September 2009 between Italy and **USA** for the Research and Development in the Nuclear Energy Field.
 - In November 2006 ENEA and Oak Ridge National Laboratory US-DOE signed an "Action Sheet for Cooperation in Nuclear-Related Technology Research and Development";
 - In February 2008 ENEA and Argonne National Laboratory US-DOE signed the I-NERI (*International Nuclear Energy Research Initiative*) for the joint development of the DEMO of a Lead-cooled Fast Reactor (Gen IV).
- A Bilateral Agreement between the Italian Ministry of Economic Development and the Russian Rosatom has been also signed very recently.

Renaissance of nuclear energy in Italy: Legal Framework



- Law 6 August 2008, n. 133**, "Urgent provisions for economic development, simplification, competitiveness, the stabilization of public finance and tax equalization" (published in the Official Gazette No. 195, August 21, 2008).
- The Law, *inter alia*, promotes the renaissance of nuclear energy in Italy.
- The Law, the first since the 1987 moratorium, announced a new National Energy Plan with the goal of:
 - implementing nuclear energy production facilities in the national territory;
 - promoting research on nuclear Gen IV (GIF) and on nuclear fusion.

Renaissance of nuclear energy in Italy: Legal Framework



- After one year of intense debate, the Italian Parliament approved the **Law 23 July 2009, n. 99**, "Provisions for the development and internationalization of enterprises, and energy" (published in the Official Gazette No. 176, 31 July 2009).
- Law 99/2009, that entered into force on 15 August 2009, contains the fundamental principles of the new Italian nuclear legal framework:
 - Art. 25 Government is entitled to establish legislative procedure for the Italian NPPs siting and licensing
 - Art. 26 CIPE defines the types of plants for the new NPPs and the criteria to promote the constitution of consortia
 - Art. 29 Creation of an independent Nuclear Safety Agency
 - Art. 27/37 Reorganization of SOGIN and ENEA
 - Art. 38 Promotion of innovation in the nuclear sector

Contents of the Parliament assignment – art. 25



Due to the Parliament assignment, Government has approved the Legislative Decree 15 February 2010, n. 31 (published in the Official Gazette No. 55, 8 March 2010), containing:

- The definition of a Government nuclear strategy as a part of the national energy strategy
- The criteria for the plant site definition and the certification procedures
- The new simplified procedures for combined construction and operation licensing, subject to the Environmental Impact Assessment and the Strategic Environmental Assessment of:
 - Nuclear power plants, including on-site spent fuel and radwaste storage facilities
 - Nuclear fuel fabrication plants
 - Technological Park for temporary storage of nuclear spent fuel and high level radioactive wastes, and for disposal of intermediate and low level radioactive wastes, as well as relevant scientific research and technological development

Contents of the Parliament assignment – art. 25



- Rules for operators concerning radioactive waste management and nuclear plants decommissioning, including the creation of an ad hoc decommissioning fund
- The qualification criteria that operators shall satisfy in order to run construction, operation and decommissioning activities of nuclear plants
- Wide information campaign to the Italian population on nuclear energy (in particular, safety, security, and economics)
- Financial compensation to the involved municipalities and population.

CIPE Decisions on type of NPPs and measures to promote consortia – art. 26



- CIPE is the Interministerial Committee for the Economic Planning whose members are the Ministers of the Italian Government in the economic field.
- Pursuant to Law 99/2009, CIPE has to adopt **2 Decisions**:
 - Types of NPPs, for the production of electricity, to be built in Italy
 - Criteria and measures to promote the constitution of consortia for the NPPs construction and operation, composed of electricity producers and industries.

Italian Nuclear Safety Agency – art. 29



- Art. 29 of Law 99/2009 creates an independent Nuclear Safety Agency
- The Agency is the only national authority for safety, security, safeguards and radioprotection, operating on the basis of the international best practices
- The Agency is a Collegial Board composed as follows:



Promotion of R&D and innovation in the nuclear sector – art. 38



CIPE (Interministerial Committee for the Economic Planning) has to approve an action plan, proposed by the Ministry of Economic Development, aiming at participating to international nuclear R&D programmes:

- Generation Four International Forum (GIF)
- Global Nuclear Energy Partnership (GNEP)
- International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)
- International Thermonuclear Experimental Reactor (ITER) and related Broader Approach
- Bilateral cooperation agreements in the field of nuclear energy research and technological development (France, Russia, USA).

R&D ACTIVITIES ON NUCLEAR FISSION

ENEA tasks and functions



- ENEA** (the former National Agency for New Technologies, Energy and the Environment) becomes the **Italian National Agency for New Technologies, Energy and Sustainable Economic Development**
 - ENEA's main activities are *“research, innovation technology and advanced services in the energy field - especially nuclear energy - and sustainable economic development”*.
 - ENEA's definition and organizational process will be finalized by an ad hoc Decree of MED (*to be adopted*).

ENEA & NUCLEAR FISSION



- ENEA is fully involved in the “Italian nuclear program” as Technical Support Organization of the Nuclear Safety Agency and for the qualification of the industrial domestic sector
- ENEA actively participates in several national, European and international R&D nuclear projects, providing:
 - professional skills, laboratories, tests facilities and specific expertise;
 - Sharing RD&D results on advanced nuclear technologies (materials, simulation & modelling, safety & security, experimental testing, etc.), Generation IV and Small Modular Reactors, innovative fuel cycles, etc.
- Strong cooperation with international nuclear agencies as IAEA and NEA, as well as with foreign countries: France, USA, Russian Federation, etc....

NUCLEAR FISSION- MAIN ACTIVITIES

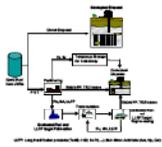


Main goals of the ENEA effort on nuclear fission are:

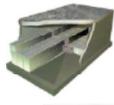
- Contribute to the development of advanced/innovative nuclear systems able to compete in the perspective of the national energy mix re-arrangement expected to take place in the years ahead;
- Support the Government for the selection of a suitable site for final disposal of Low-Medium Radioactive Waste and long-term storage of High Level Nuclear Wastes;
- Contribute to renaissance and sustain growth of necessary competence and industrial capabilities, through participation to real-founded R&D international/European projects;
- Sustain the effort required to national industry for keeping the pace at world and domestic level;
- Advice to national authorities and, in particular, to the Nuclear Safety Agency in the field of nuclear activities at large.

Main Topics of the National Programme

Studies on nuclear energy at large, scenario studies, nuclear fuel cycle and PP&PR



R&D on characterization of radioactive wastes and basic studies in support to the design of a final medium and high level waste repository

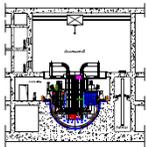



Main Topics of the National Program (cont')

Small-Medium GEN-III+ Reactors → IRIS

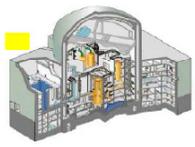



Generation IV Reactors → LFR, SFR & VHTR



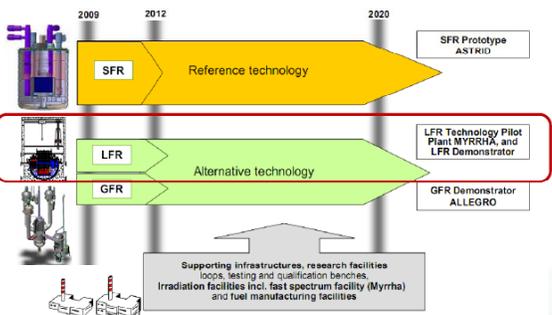

Main Topics of the National Program (cont')

Technical Support to the Safety Authority for the Licensing of the selected advanced GEN-III Reactors in Italy




Education & Training + Communication

ESNII - European Sustainable Nuclear Industrial Initiative
A contribution to the EU Low Carbon Energy Policy: Demonstration Programme for Fast Neutron Reactors



Significant contributions by a number of Italian organizations (Ansaldo Nucleare, ENEA, CIRTEN, SRS Group, ecc.) to all the building blocks of ESNII (CP-ESFR, ELSY/LEADER, GoFAST, CDT, ADRIANA, GETMAT, MATTER, EERA, ecc.)

Next European step: LEADER
Lead-cooled European Advanced DEMonstration Reactor

Project Goals:

- Review of the ELSY design in light of the safety analysis carried out so far in order to identify possible improvements of the industrial LFR configuration
- Definition of an updated LFR reference configuration
- Conceptual design of a scaled down facility (DEMO → ALFRED) of the order of 100 MWe (to be representative at affordable cost)

Just started in April, 2010

NUCLEAR FUSION - MAIN ACTIVITIES

ENEA considers of utmost importance to continue developing nuclear fusion. Therefore a comprehensive fusion program has been defined along the lines established together with the international community in the frame of the 'accompanying program and the BA. The program covers the next decade and consists of the following main items:

- The construction of FAST (Fusion Advanced Studies Torus), an experimental device intended as European satellite to ITER and in preparation of DEMO;
- The participation, together with industries, to ITER construction;
- The participation in the activity included in the Eu-Japan bilateral agreement called 'Broader Approach'.

Thanks to the know how developed in the past decades, ENEA is going to play an important role in the ITER construction and the completion of the related R&D, also in cooperation with industry. The most remarkable examples are:

- ➔ the construction of the superconductive cable for the magnet system;
- ➔ the fabrication of the plasma facing component;
- ➔ the metrology and vision system based on laser technology. Furthermore, ENEA is involved in the realization of the neutron diagnostic (Radial Neutron Camera).

NUCLEAR FUSION - MAIN ACTIVITIES

Program	Description
ITER	Supply of system and components in cooperation with the national industry
ITER	Design and development of prototypical component (FAST)
BROADER APPROACH	Components manufacturing for the JT60-SA (Japan) machine and for the IFMF experimental facility
CONSORTIA CONSTITUTION WITH EUROPEAN RESEARCH LABORATORIES	Participation at joint research activities for the design and development of High Tech components to be deployed to the above projects
TECHNICAL DEVELOPMENT (EURATOM, IPER)	Inertial fusion

International Forum for Reactor Aging Management (IFRAM)

The following article on a very interesting new initiative - to develop IFRAM - was submitted by [Leonard J. Bond](#), Laboratory Fellow at the Pacific Northwest National Laboratory.

There is a compelling need for extending the service life of nuclear power plants. Globally there are approximately 440 operating commercial nuclear power plants (NPP) in 30 countries. These plants, which have an average age greater than 20 years, were initially licensed to operate for 30 years (outside the U.S.) to 40 years (U.S. standard). To meet the growing global demand for electricity, particularly to support development, it is projected that about 2,300 GWe of new generating capacity would need to be built over the next 20-30 years. There are currently about 40 new NPPs under construction (all outside the U.S.) and at least 222 new NPPs (including 45 in the U.S.) that are being considered in 42 nations; 14 of these nations currently do not have domestic commercial nuclear power programs. The costs for these projects are being projected to be significant (up to \$7.5 billion for a new U.S. 1,000+ MWe plant); and the recent economic downturn has the potential to delay or cancel many of these projects. However, there remains the ever increasing need for reliable supplies of electricity coupled with a growing desire to limit carbon emission and convert to transportation powered by electricity. These factors explain the current interest in extending the service life of existing NPPs.

Promote Global Cooperation

If parties interested in extending the service life of nuclear power plants cooperate, this goal will be achievable. In almost all countries with NPPs, regulatory authorities and the nuclear industry are looking at some form of extended operating periods. To support life extension activities, it is necessary to ensure the continued safety and reliability of the NPP's systems, structures, and components (SSCs) and the component materials. Internationally, a variety of individual national and international activities have been initiated, including Plant Life Management (PLiM) through the IAEA, EPRI's Long Term Operation (LTO) program, and various national programs in managing materials degradation and related topics.

The strategy is to establish an entity to facilitate global cooperation in reactor aging management. The NRC, supported by the Pacific Northwest National Laboratory (PNNL), is seeking to facilitate the establishment of an International Forum that would be a network of international experts who would exchange information on operating experience, best practices, and emerging knowledge. These experts would be willing to work jointly and leverage the separate efforts of existing national programs into a unified approach to enable the potential for the safe and economic life extension of NPPs.

Concept for IFRAM

The primary purpose of the International Forum for Reactor Aging Management (IFRAM) will be to promote global cooperation. The Charter and Operations Guidelines documents will give the details; however it will embody the following characteristics. It

is not intended to be regulatory-led, utility-led, university-led or research organization-led. Participation is open to individuals, groups and organizations with interests in reactor aging management.

IFRAM may become a legal entity but this is not necessary to accomplish its mission. Although it will be active worldwide, it will not be located in any specific location or organization. It will exist and operate in a virtual manner. The success of IFRAM will depend largely on the use of technologies that enable people to communicate and cooperate readily from around the world. IFRAM will not replace any cooperative efforts. Rather it will support them and seek to create other avenues for cooperation. Wherever possible, IFRAM will host meetings in conjunction with meeting planned by other groups. IFRAM will not need staff, as the participants will organize and lead activities. Leadership will be by volunteers. IFRAM will capitalize on participants with initiative, ideas and resources to make research and other activities happen. It will be instrument in promoting projects that involve huge sums yet it won't have a budget of its own. It will not be a funding agency.

IFRAM will be mutually beneficial for all participants. Some of the benefits of participation are sharing, saving, increasing and targeting:

- **Sharing**: ideas, knowledge, identification of high priority problems, how to derive knowledge, trends and directions, access to historic data, lessons learned, best practices, skills, expertise, access to experts, access to shared facilities, data including materials data, problems and accidents information, information on successful proactive actions, regulations, program information - who is doing what, newest technology, standards, facilities and infrastructure.
- **Saving**: time, effort, money and lives...doing more with less and doing it better! Better coordination among programs means savings.
- **Increasing**: use of successful practices, quality of outcomes, degree of consensus on issues, value of national programs, shared resources, cooperation, and innovation.
- **Targeting**: key technical areas such as 1) critical aspects of materials and their degradation mechanisms, including potential future degradation in operating plants; 2) improving the effectiveness of in-service inspection (ISI), condition-based maintenance (CBM), and on-line monitoring and prognostics (OLMP); 3) probabilistic risk assessments to support reactor aging management; and 4) development of new and improved mitigation and repair strategies and their potential effects on ISI, CBM, and OLMP.

Current Status

IFRAM is well on its way to becoming a reality. A proposal for IFRAM was discussed at engagement workshops held in Asia (October 2009) and in Europe (May 2010). The result was the establishment of the IFRAM Global Steering Committee (GSC) to carry out all of the activities necessary to start-up IFRAM in 2011. This effort has quickly expanded to gather support from around the world.

A part of the rationale for IFRAM is:

- Organizations worldwide share common aging management challenges;

- Magnitude and scope of these challenges means that any one organization cannot successfully resolve all of them within the limits of their available time and resources;
- Cooperation is a powerful tool to economize resources, save time and minimize needless duplication of efforts in addressing these challenges.

If all participants say, “Help us and let us help you,” then IFRAM will be able to achieve its mission.

The IFRAM Global Steering Committee (GSC) held its first meeting on July 8th, 2010, by conference call. Committee members include:

- Tetsuo Shoji, Nuclear and Industrial Safety Agency & Tohoku University
- Il Soon Hwang, Seoul National University
- Michel Bieth, Joint Research Centre, European Commission
- Jan van der Lee, Materials Aging Institute
- Rauno Rintanaa, NULIFE
- Milan Brumovsky, Nuclear Research Institute Rez
- C.E. (Gene) Carpenter, U.S. Nuclear Regulatory Commission
- Richard Reister, U.S. Department of Energy
- John Gaertner, Electric Power Research Institute
- Ki-Sig Kang, International Atomic Energy Agency
- Alejandro Huerta, Nuclear Energy Agency
- Han En-Hou, Institute of Metal Research
- Vivekanand Kain, Homi Bhabha National Institute
- Andrei Blahoianu, Canadian Nuclear Safety Commission
- Leonard Bond, Pacific Northwest National Laboratory (GSC Secretariat)

The primary goals for the GSC are to prepare the organizing Charter for IFRAM, create the Operations Guidelines, and make arrangements for the 2011 start-up event.

- Prepare IFRAM Charter. The Charter will describe why IFRAM is necessary and point to its benefits. It will describe what IFRAM will do and who will help carry out its mission to promote global cooperation. The GSC will develop a charter to provide the IFRAM with the format and flexibility necessary to:
 - Strengthen regional, and build global, networks;
 - Facilitate the development, and sharing of, data, information and best practices; and,
 - Identify opportunities to leverage resources to accomplish technical and operational objectives.
- Create Operations Guidelines. The IFRAM Operations Guidelines will describe the types of IFRAM activities, when they will be conducted, and how they will be managed. The GSC will create this roadmap for how interested parties from around the globe can benefit from participation in IFRAM. A key attribute which is crucial to IFRAM’s success is its ability to be *nimble* in achieving its objectives. Specifically, IFRAM will be *nimble* in that, as issues arise, the organization will be structured to facilitate technical experts from around the world to be able to quickly respond to the emerging issue, help develop technical responses and research plans, and coordinate organizational cooperation in

addressing the issue. Without this ability, IFRAM's immense contribution to reactor aging management will be jeopardized.

- Make Arrangements for the IFRAM Start-up Event. The GSC will select the date, location and venue for an IFRAM global meeting. It will cooperate with others to make full plans for this "Start-Up Event". In addition, GSC will initiate the following tasks to help IFRAM's start-up be more effective.
- Initiate Global Network. Build a global network of parties interested in reactor aging management. The GSC will brainstorm to identify organizations, groups and individuals.
- Use Tools for Sharing. Develop a cadre of tools to promote global sharing and cooperation such as websites, electronic newsletters, web conferencing, and conference calls. The objective is to capitalize on the ease, speed and low cost of electronic communications.
- Gather Information. Conduct internet on-line survey to gather information about on-going projects and programs and the capabilities and experience of groups and individuals. The information about on-going projects and programs will make it possible to identify opportunities for cooperation, reduce redundancy, find gaps in efforts to address technical issues, and develop a comprehensive integrated approach for reactor aging management. The information on capabilities and experience of groups and individuals will be used to establish technical focus groups and match capabilities and experience to technical issues.

The GSC picked early summer 2011 for the "kick-off" event for IFRAM. Specific dates and locations are being considered. Committee members noted some existing charters that could be models for the IFRAM Charter. The IFRAM pages on the Proactive Management of Materials Degradation (PMMD) website were noted: <http://pmmd.pnl.gov/program/forums.aspx>.

The Pacific Northwest National Laboratory (PNNL) will develop an IFRAM questionnaire to gather information about on-going projects/programs and the capabilities and experience of groups and individuals and create a draft outline for the Operations Guidelines.

Secretariat for IFRAM Global Steering Committee

Direct your questions about IFRAM to:

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Societies with Collaboration Agreements with ANS

The following is a list of nuclear societies with collaboration agreements with the ANS, along with the corresponding website addresses. The Table contains also a few other entries of interest to ANS International Committee members.

Society	Website or E-Mail Address
Asociación Argentina de Tecnología Nuclear	-
Associação Brasileira de Energia Nuclear	www.aben.com.br
Association des Ingénieurs en génie atomique du Maroc	-
Atomic Energy Society of Japan	wwwsoc.nii.ac.jp/aesj/index-e.html
Australian Nuclear Association	www.nuclearaustralia.org.au
Bangladesh Nuclear Society	-
British Nuclear Energy Society	www.bnes.com
Bulgarian Nuclear Society	www.bgns.bg
Canadian Nuclear Society	www.cns-snc.ca
Chinese Nuclear Society	www.ns.org.cn
Croatian Nuclear Society	hnd.zvne.fer.hr
Czech Nuclear Society	www.csvts.cz/cns
European Nuclear Society	www.euronuclear.org
Hungarian Nuclear Society	www.kfki.hu/~hnucsoc/hns.htm
Indian Nuclear Society	www.indian-nuclear-society.org.in
Israel Nuclear Society	meins@tx.technion.ac.il
Korean Nuclear Society	www.nuclear.or.kr/e_introduce.php
Lithuanian Energy Institute	www.lei.lt
Malaysian Nuclear Society	www.mint.gov.my/mns
Nuclear Energy Society of Kazakhstan	www.nuclear.kz
Nuclear Energy Society of Russia	ns@kia.ru
Nuclear Energy Society of Slovenia	www.drustvo-js.si
Nuclear Energy Society of Thailand	www.nst.or.th
OECD/Nuclear Energy Agency	www.nea.fr
Polish Nuclear Society	www.ptn.nuclear.pl
Romanian Nuclear Energy Association	www.aren.ro
Romanian Society for Radiological Protection	www.ispb.ro/rsrp.htm
Slovak Nuclear Society	www.snus.sk
Sociedad Nuclear Española (SNE)	www.sne.es
Sociedad Nuclear Mexicana	www.sociedadnuclear.org.mx
Ukrainian Nuclear Society	www.ukrns.odessa.net
Women in Nuclear – Global	www.win-global.org
Affiliated National Societies	Website or E-Mail Address
Belgian Nuclear Society	www.bns-org.be
Associated Nuclear Organizations	Website or E-Mail Address

International Nuclear Societies Council	http://insc.ans.org
Pacific Nuclear Council	www.pacificnuclear.org
Non-U.S. Local Sections	Website or E-Mail Address
Austrian Section	
French Section	http://local.ans.org/france/
Italian Section	
Japanese Section	
Latin American Section	www.las-ans.org.br
Korean Section	
Swiss Section	
Taiwan Section	u805301@taipower.com.tw

Calendar of Events

Some Upcoming International Conferences on Nuclear and Related Topics
(Please send us information about your upcoming conferences, for inclusion in this space.)

Legend:

☀ ANS Event

☐ Non-ANS event co-sponsored by ANS

2010

- 24-30 October: 17PBNC, 17th Pacific Basin Nuclear Conference, “Nuclear Energy: An Environmentally Sound Option”, Cancún, México; organized by Sociedad Nuclear Mexicana - <http://www.pbnc2010.org.mx>
- 1-3 November: Canadian Nuclear Society Technical Meeting on Low-Power Critical Facilities and Small Reactors, “Celebrating ZED-2’s 50th Anniversary”, Ottawa, ON, Canada – <http://www.cns-snc.ca/events/tmlpcfsr/>
- 7-11 November: ANS Winter Meeting and Nuclear Technology Expo, Las Vegas, NV, USA – <http://www.ans.org/meetings> ☀
- 7-11 November: NPIC&HMIT 2010, 7th International Topical Meeting on Nuclear Plant Instrumentation, Control and Human Machine Interface Technologies, Las Vegas, NV, USA – <http://www.ans.org/meetings> ☀



2011

- 6-9 February: Conference on Nuclear Training and Education (CONTE 2011), Jacksonville, FL, USA – <http://www.ans.org/meetings> ☀

- 7-10 February: Nuclear and Emerging Technologies for Space 2011 (NETS 2011), Albuquerque, NM, USA – <http://anstd.ans.org/NETS2011/AboutNETS2011.htm> ☀
- 13-16 March: 5th International Symposium on Supercritical-Water-Cooled Reactors, Vancouver, Canada – <http://www.cns-snc.ca/events/isscwr-5/> 
- 13-17 March: International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2011), Wilmington, NC, USA – <http://meetingsandconferences.com/psa2011/> ☀
- 3-7 April: 10th International Topical Meeting on Nuclear Applications of Accelerators, Knoxville, TN, USA – <http://accapp11.org> ☀
- 10-14 April: International High-Level Waste Management Conference, Albuquerque, NM – <http://www.ans.org/meetings/ihlrwm> ☀
- 2-5 May: International Congress on Advances in Nuclear Power Plants (ICAPP'11), “Performance & Flexibility: the Power of Innovation”, Nice, France – <http://www.sfen.fr> □
- 8-12 May: International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2011), Rio de Janeiro, Brazil – <http://www.tdn.com.br/mc2011/> □ 
- 15-19 May: 15th International Conference on Emerging Nuclear Energy Systems, San Francisco, CA, USA - <http://www.ans.org/meetings> ☀
- 12-15 June: 32nd Annual Conference of the Canadian Nuclear Society and 35th CNS/CNA Student Conference, Niagara Falls, Ontario, Canada – <http://www.cns-snc.ca> 
- 19-24 June: ICRER 2011, McMaster University (Hamilton, Ontario), Canada – <http://www.ecorad2011.net>

- 26-30 June: ANS Annual Meeting, Hollywood, FL, USA – <http://www.ans.org/meetings> ☀
- 7-10 August: Third International Joint Topical Meeting on Emergency Preparedness and Response and Robotics and Remote Systems, Knoxville, TN, USA – <http://www.eprsd.org/> ☀
- 21-25 August: International Symposium on Future I&C for Nuclear Power Plants, Cognitive Systems Engineering Approach to Power Plant Control, International Symposium on Symbiotic Nuclear Power Systems (ICI 2011), Daejeon, Republic of Korea – <http://www.ici2011.org>
- 4-9 September: Global 2011, “Innovative Nuclear Energy Systems Toward 2030 and Beyond”, Nagoya, Japan – <http://wwwsoc.nii.ac.jp/aesj/division/recycle/global2011/> □
- 11-14 September: 2011 Water Reactor Fuel Performance Meeting, Chengdu, China, organized by Chinese Nuclear Society – <http://www.ns.org.cn/cn/WRFPM> □
- 11-15 September: Canadian Nuclear Society Conference on Waste Management, Decommissioning and Environmental Restoration for Canada’s Nuclear Activities 2011, Toronto, Ontario, Canada - <http://www.cns-snc.ca> □
- 12-15 September: Nuclear Society of Slovenia’s 20th International Conference “Nuclear Energy in New Europe”, Bovec, Slovenia (<http://www.nss.si/nene2011/>).
- 18-23 September: 3rd International Nuclear Chemistry Congress (3rd-INCC), Città del Mare, Palermo, Sicily, Italy – <http://3rdINCC.MI.INFN.IT>
- 19-22 September: International Conference on Criticality Safety, Edinburgh, Scotland
- 25-29 September: 14th International Topical Meeting on Nuclear Reactor Thermalhydraulics (NURETH-14), organized by the Canadian Nuclear Society, Toronto, Ontario, Canada – <http://www.cns-snc.ca/events/nureth-14/> □
- 26-28 September: International Conference on Physics and Technology of Reactors and Applications (PHYTRA2), Fez, Morocco – www.gmtr-association.com/phytra2/ □



- 2-5 October: International Conference on the Future of Heavy-Water Reactors, organized by the Canadian Nuclear Society, Ottawa, Ontario, Canada - <http://www.cns-snc.ca/events/cns-fhwr/>
- 30 October-3 November: ANS/ENS International Winter Meeting and Nuclear Technology Expo, Washington, DC, USA – <http://www.ans.org/meetings> ☀

2012

- 25-30 March: 9th International Conference on the Methods and Applications of Radioanalytical Chemistry (MARC IX), Kailua-Kona, HI, USA ☀
- 15-20 April: Topical Meeting on the Physics of Reactors (PHYSOR 2012), “Advances in Reactor Physics – Linking Research, Industry, and Education”, Knoxville, TN, USA – <http://www.ans.org/meetings>
- 10-13 June: 33rd Annual Conference of the Canadian Nuclear Society and 36th CNS/CNA Student Conference, Saskatoon, Saskatchewan, Canada – <http://www.cns-snc.ca>
- 24-28 June: ANS Annual Meeting, Chicago, IL, USA – <http://www.ans.org/meetings> ☀
- 22-26 July: 8th International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human Machine Interface Technologies (NPIC&HMIT 2012), San Diego, CA, USA ☀
- 17-21 September: 8th International Conference of Nuclear and Radiochemistry (NRC-8), Como (Lake of Como), North-East Italy, Chairman Mauro Bonardi (Mauro.Bonardi@mi.infn.it) – <http://nrc8.mi.infn.it> (under construction) 
- 11-15 November: ANS Winter Meeting and Nuclear Technology Expo, San Diego, CA, USA – <http://www.ans.org/meetings> ☀

2013

- 2-5 June: 34th Annual Conference of the Canadian Nuclear Society and 37th CNS/CNA Student Conference, Toronto, Ontario, Canada – <http://www.cns-snc.ca>
- 16-20 June: ANS Annual Meeting, Atlanta, GA, USA – <http://www.ans.org/meetings> ☀
- 10-14 November: ANS Winter Meeting, Washington, DC, USA – <http://www.ans.org/meetings> ☀

→ **Contact ANS International Committee Members by E-mail:**

Please note: This list does not take into account the new appointments made by incoming ANS President Joe Colvin.

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