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No 12

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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Acknowledgements: The editors would like to thank [Dr. Rolland Langley](#) and [Mr. Mike Diekman](#) of the ANS for their invaluable help in stimulating reports and collecting news items for *The ANS Globe*. [Mike Diekman](#) also kindly ensured the correctness of contact information for International Committee members and Agreement Societies.

Get-Well Message to Mike Diekman

On behalf of its co-editors and all its readers, and of the ANS International Committee, *The ANS Globe* sends heartfelt wishes to [Mike Diekman](#) for a quick and full recovery following his by-pass surgery. Get well quick, Mike!

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From the Chair



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

Dear friends in the international nuclear community,

It is my honor to have been asked to address you in this issue of the ANS Globe. Last year while Vice-President/President-Elect and this year as President of the American Nuclear Society, I have had the privilege of traveling to many countries to represent ANS. I have been to Argentina, Mexico, Malaysia, Russia, France, Italy, Austria, Hungary, Canada, Japan, Belgium, Switzerland, Slovenia, and Taiwan. On each of these trips, I have had the pleasure of communicating with local officials working in the energy and nuclear energy arenas. These discussions have reiterated to me the connectedness of the global nuclear industry and the importance of ensuring a bright global nuclear future.



The worldwide nuclear renaissance is already upon us. Operating nuclear power plants have maintained fantastic operational and safety records, paving the way for the next generation. Utilities around the globe are constructing, or are considering constructing, the next generation of new nuclear power plants as you read this newsletter.

In many cases, however, the giga-watt scale reactors being considered may not be the best option. These large reactors may simply be too costly, or perhaps there is simply no need for large amounts of electricity in a certain area. When considering the future of nuclear power, I believe the industry needs to also think small. Small reactors, rated at less than 200 MWe, offer several potential advantages over large reactors. In addition to being much more affordable, small reactors could likely be constructed in factories and then deployed in the field, further reducing costs. Also, instead of taking advantage of “economies of scale,” the installation of multiple units at one site could keep the cost per kilowatt low. Adding power to the grid in small packets has historically been attractive to utilities, and will likely continue to be so.

The potential benefits of small reactors, which were discussed extensively among ANS members at the recent ANS Annual Meeting in Atlanta, are a topic of great interest to me. Nuclear energy is already an important contributor to power generation in many countries. However, its expansion is somewhat limited by continuing focus on very large generating systems. The development of “right-sized” reactors could help create a future in which realistic, inexpensive, long-lived energy supplies help provide a basis for lasting peace and prosperity

I look forward to working together with you for the remainder of my term as ANS President to help shape the future of the next generation of nuclear power plants. I also

hope to meet with as many of you as possible either during ANS meetings or during my future visits to your respective countries. Thank you for your support of ANS and the ANS International Committee and for your contributions of information to the ANS Globe. These communications provide a unique opportunity to share experiences and new ideas among this important peer group.

With best regards,

Tom Sanders

ANS President

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.

Candidates of ANS IC for 2009 Elections to ANS Board of Directors

For the 2010 election to the Board of Directors, the International Committee was to suggest nominees from the Americas Region to the ANS Nominating Committee. At its meeting in Atlanta, the IC voted to recommend the following nominees:

- [Dr. Krish Krishnan](#), of Canada
- [Dr. Dan Meneley](#), of Canada

The ANS is very thankful to both candidates for their willingness to serve as a member of the Board of Directors.

News from Sister Societies and International News

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

2009 marks the **30th anniversary** of the Canadian Nuclear Society (CNS)! The officers of the CNS for 2009-2010 are:

- President: [Eleodor Nichita](#), University of Ontario Institute of Technology
- 1st VP: [Adriaan Buijs](#), McMaster University
- 2nd VP: [Frank Doyle](#), CANDU Owners' Group

- Pas President: [Jim Harvie](#), Canadian Nuclear Safety Commission, Retired
- Secretary: [Prabhu Kundurpi](#), Ontario Power Generation, Retired
- Treasurer: [Eric Williams](#), Bruce Power, Retired

[Bryan White](#), of the CNS Education and Communications Committee, sends the following report:

[The CNS's Ionizing-Radiation Workshop and Geiger-Detector Program](#)

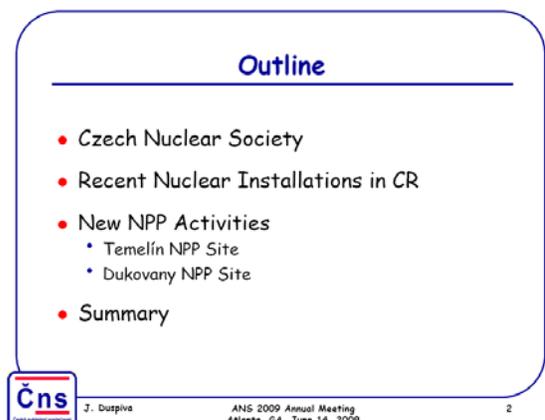
The CNS Education and Communications Committee has developed an ionizing-radiation workshop for high-school science teachers. This workshop provides teachers with material they may use to enrich their lessons and is intended to complement the education website developed by the Canadian Nuclear Association, which addresses the Pan-Canadian Science Curriculum (see www.cna.ca). The workshop introduces the Interactive Chart of the Nuclides and features experiments that use a sensitive Geiger-Müller detector interfaced to a PC to monitor background radiation in the classroom in real time, and conduct a series of experiments using Naturally Occurring Radioactive Material sources.

The experiments include simple shielding and scattering observations using paper and aluminum foil with a potassium-chloride salt substitute (5 kBq ⁴⁰K). By using vintage “Vaseline Glassware” (uranium) and specific vintage camera lenses (thorium) the teachers may use the much higher count rates to make more extensive absorber and range measurements. The significant alpha content may be used to demonstrate electron scattering from thin foils.

Most schools lack the resources to purchase such a sensitive detector. The CNS has donated 52 GM kits to schools starting in the mid-90s, with 44 of these in 2009. The workshop has been presented 6 times in 4 venues. The presentation file, the workshop notes, and a list of schools that have received these Geigers are available for download from the CNS website, www.cns-snc.ca.

- [Czech Nuclear Society](#)

The following is a presentation made at a meeting of the ANS Committee on new construction by Jiri Duspiva, Dept. of Reactor Technology Nuclear Research Institute Rez plc., on new construction activities in the Czech Republic.



Czech Nuclear Society (ČNS)

- History
 - Established in 1990 as founding member of Czech Association of Scientific and Technical Societies
 - Member of ENS
- Membership
 - Individual or Corporate
- Structure of society
 - Board - 5 years term of office
 - Professional group (reactor physics, nuclear chemistry...)
 - Other groups
 - WIN, CYG



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Czech Nuclear Society (ČNS) (2)

Activities

- Organization of conferences and meetings
 - NUSTM (annually, with SNUS and KT6)
 - VVER Conference (2y period)
 - "Santa Cloud" Meeting - CYG (annual)
 - Meetings of professional groups
 - Awarding
 - Diploma thesis in nuclear field
 - Vocational activity at high school - technical fields
- Web pages
 - Most of contributions in Czech
- Brochures or books
 - Who is who in Czech and Slovak Nuclear Field
 - Temelin cause
 - Chernobyl inheritance (translated IAEA document)
 - Nuclear Smiles - book of cartoons
- International collaboration
 - Memorandum of Cooperation with ANS since 1992
 - NUCNET



"Nuclear Smiles" from page



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Recent Nuclear Installations in the Czech Republic

- Two NPPs in operation in CR (ČEZ a.s.)
 - Dukovany NPP
 - 4 units of VVER-440/213 (1985)
 - Temelin NPP
 - 2 units of VVER-1000 (2000)
- Nuclear Research Institute Rež plc.
 - Two research reactors
 - LVR-15 (max. power 10 MWth)
 - LR-0
- Czech Technical University Prague
 - Faculty of Nuclear Sciences and Physical Engineering
 - Zero power reactor VB-1
- Capability to build new NPP
 - All main components at Temelin NPP produced by Czech companies (excluding MCP and fuel)
- Spent fuel medium term storage
 - Dukovany NPP - whole life time
 - Temelin NPP - whole life time in 2010
 - It is future source
 - Reprocessing instead of repository



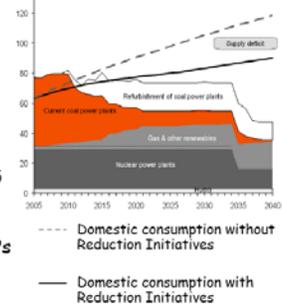
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Recent Electricity Production and Future Prospect

- Supply deficit after decommissioning of existing plants and consumption growth
 - Scenario without new NPP
 - Decommissioning of Dukovany NPP in 2035 approximately
- Supply deficit should be closed by new NPPs



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Essential Requirements for Establishment of New NPPs

- Pressurized Water Reactor
- Electrical output in range 1000 - 1700 MWe
- Two units at Temelin site - existing site and infrastructure
- Possibility of extension of Dukovany site is being evaluated
- Generation III
- Compliance with the licensing requirements (Czech legislation, license in country of origin, EUR, etc)



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Possible Designs for Temelin NPP Completion



Project	Vendor
AP 1000	Westinghouse USA
EPR 1600	AREVA EU
VVER 1000	Atomstrojexpo rt Russia
EU APWR 1700	Mitsubishi Japan



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What Has Been Done for Two New Units in Temelín?

- Request for information
 - Questions to vendors
 - Information for
 - Feasibility Study
 - Environmental Impact Assessment
 - Announcement to European Commission - Euroatom Treaty
 - Safety report (approval of CR SONS)
 - Documentation - Civil Engineering Law
 - Bidding process preparation



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Feasibility Study

- Very extensive documentation in each of steps



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What Has Been Done for Two New Units in Temelín? (2)

- Study of acceptable unit size in Czech electrical grid
- Study of electrical connection
- Section Project manual
- Environmental Studies
- Communication Program
- Comparison of license requirements
- Transportation study for heavy/large equipment
- Study - Vltava River capacity
- Others

Most of steps already done are studies prepared by ČEZ a.s. or other institutes for ČEZ a.s.



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Bid Invitation Specification (BIS) Preparation

Structure of BIS

- Qualification Documents (QD)
- Letter of Invitation (LI)
- Instruction to Bidders (IB)
- Scope of Supply (SS)
- Technical Requirements (TR)
- Technical Data Sheets (DS)
- Nuclear Fuel (NF)
- Project Organization (PO)
- Economic and Financial Requirements (EF)
- Draft Contract (DC) /Legal Specifications (LS)
- Evaluation Criteria (EC)

Documentation prepared in consultation with national and international partners



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Safety Documentation

- Sitting Phase Documentation completed
 - Regulatory body permission request
- Physical protection analysis
- Quality Assurance Program
- Figure
 - Example of QA document title page
 - Temelín NPP completion
 - Sitting phase

Číslo	Popis	Stav	Termín
1.01	Program zabezpečování jakosti	Ukončen	2008
1.02	Program fyzické ochrany	Ukončen	2008
1.03	Program bezpečnosti	Ukončen	2008
1.04	Program ochrany životního prostředí	Ukončen	2008
1.05	Program ochrany zdraví	Ukončen	2008
1.06	Program ochrany veřejnosti	Ukončen	2008
1.07	Program ochrany majetku	Ukončen	2008
1.08	Program ochrany životního prostředí (pokračování)	Ukončen	2008
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Environment Impact Assessment

- July 11, 2008 - ČEZ a.s. submitted EIA announcement to Ministry of Environment
- Results of review received
 - Including comments from Czech Republic, Austria, and Germany
- EIA documentation under preparation
 - Submission to ministry early 2010
 - Independent experts will prepare opponent report
 - Ministry will organize public hearing
 - Ministry will issue final statement



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Progress Chart



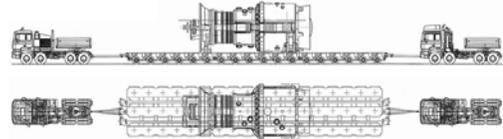
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Other Investments in Site

- Transportation route for heavy components, water, electricity, heat, IT ... connections, buildings, grid connection, etc
- Feasibility study of these investments completed
- Detail business plan approved
- Many of these investments must be completed before main construction begins



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Temelín 2009



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Temelín 2020



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Dukovany NPP

- Dukovany is the second possible site in the Czech Republic
- ČEZ a.s. uses documents already prepared for Temelín
 - This approach saves resources (man hours and costs)

Project of Dukovany NPP modernization

- Unit-3 started after modernization with increased efficiency from 33.6 to 36.4 %
- Increase of gross electricity power from 440 to 500 MWe
- All units will be modernized in 2012



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Summary

- Plans for new constructions in CR (ČEZ a.s.)
 - Temelín NPP
 - 2 units 1000-1700 MWe - preparation started
 - Dukovany NPP
 - Modernization of all 4 units in operation
 - 1 or 2 units - preliminary plans
- Joint venture JAVYS (SR, 51%) and ČEZ a.s. (49%) on construction of new unit at Bohunice site (SR)
 - Signed in May 2009
 - One unit with 1000-1600 MWe
 - Operation in 2020

JAVYS - Nuclear Decommissioning company, it owns and operated 2 units at Bohunice (VVER-440/230, closed down in 2006 and 2008)



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Summary

(2)

- ČNS supports balanced energy mix
 - New nuclear power plant strongly supported
 - Supply/demand gap could have harmful impact on state economy
 - Nuclear is excellent way to close supply/demand gap
 - Economic
 - Highly competitive
 - Good chance to realize optimal Return on Investment
 - Environment
 - No greenhouse emissions
 - Progressive development in waste management
 - Stability of supplies
 - Grid management
 - Fuel independence
 - 13 years of NPP construction - it's the highest time to begin!

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Acknowledgement

- Author acknowledges to Mr. Petr Nejedlý from the Czech Electric Company (ČEZ a.s.) for his agreement in using of materials from his contribution to the NUSIM 2009 Conference organized by Czech Nuclear Society



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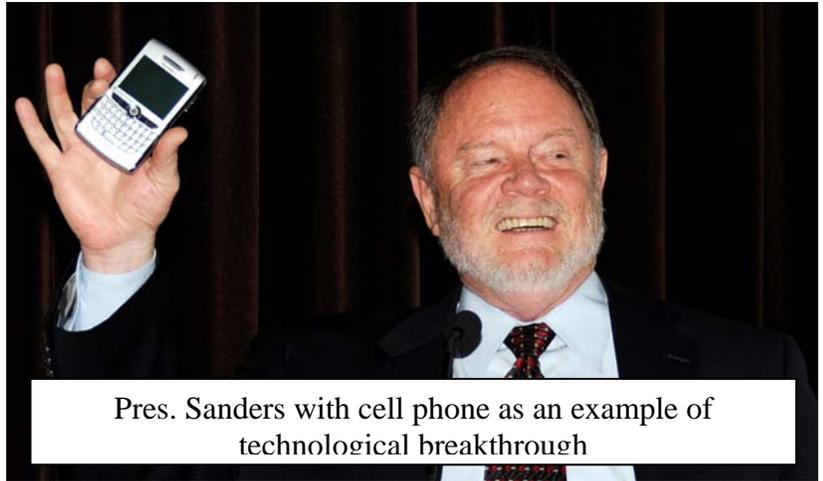
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- [French Section of ANS \(http://local.ans.org/france\)](http://local.ans.org/france)

President Sanders' Visit to France and General Assembly

Following tradition, the French Section invited ANS President Thomas Sanders to its General Assembly, held on September 7 in Paris in conjunction with the GLOBAL 2009 International Conference, which opened the same day at the Palais des Congrès. On this occasion, Dr. Sanders gave a presentation on **“Global Energy Needs: Defining a Role for the Right Size Reactor”** to a large audience, including in particular several nuclear experts attending the GLOBAL Conference, many young nuclear engineers and students, as well as senior executives from French nuclear research establishments and industry, representatives from ministries, the US Embassy in Paris, the French-American Foundation, and international agencies.



Pres. Sanders with cell phone as an example of technological breakthrough

In addition to President Sanders's lecture, French Section President Dominique Grenèche delivered the 2008 Annual Report as well as a short summary of the internship reports of three French students working during the summer at Idaho National Laboratory and Oak Ridge National Laboratory.

The General Assembly elected the new President, Jean-Claude Gauthier from AREVA NP, and the new Secretary General, Martine Mayousse from AREVA NP.

During his visit to France and in particular during GLOBAL, President Sanders met several members of the French Section's Board and discussed how to enhance cooperation between ANS and its French Section in the framework of developing the international role of the Society.

Nuclear Historic Landmark Presentation at AREVA Chalon/St Marcel Plant

A key event took place on September 10, 2009, when President Sanders went to Chalon to award the ANS Nuclear Historic Landmark to AREVA Chalon/St Marcel Plant. The Plant, nominated by the French Section was awarded this prestigious distinction for “having successfully demonstrated since 1975 its uninterrupted capacity to manufacture more than 500 high-quality heavy components for worldwide nuclear plants”.

This ceremony, including the plaque presentation, gathered all the staff of Chalon as well as AREVA senior executives. It was very successful, in particular at the internal and local communication level.



Remise du Nuclear Historic Landmark Award par Mr Tom Sanders président ANS à l'usine Areva NP Chalon Saint Marcel, Jeudi 10 Septembre 2009

In the photo, left to right: [Hervé Hottelart](#) (Areva Chalon St Marcel Plant Director), ANS President [Tom Sanders](#), [Jean-Claude Gauthier](#) (French Section Chair) and [Guillaume Dureau](#) (Executive Vice President, Equipment Sector, Areva NP)

Information Meeting

The French Section has been organizing information meetings in order to allow the French public to be aware of major US nuclear projects and achievements. For instance, [Dr. Jean-Paul Crouzoulon](#), AREVA North America Strategy Vice-President, was invited last June to Paris and gave a very interesting and comprehensive presentation on “**The United States facing the Inescapable Nuclear Renaissance**”, which attracted a very large audience.

International Conferences

GLOBAL/Topfuel 2009: Over 1100 participants

The joint **GLOBAL/Topfuel 2009 International Conference**, organized by the French Nuclear Energy Society, was held in Paris from September 6 to 10. It focused on “**The Nuclear Fuel Cycle: Sustainable Options and Industrial Perspectives**”. [Bernard Bigot](#), Chairman, French Atomic Energy Commission, was General Chair.

[Dominique Grenêche](#) (AREVA), the current [French Section Chair](#), was Technical Program Chair. [Michel Debès](#) (EDF), incoming French Section Vice-Chair, was Topfuel Technical Program Chair. This major international scientific event attracted over 1100 participants from [34 different countries](#).

In addition, as is the case each year, a great number of Section members have been and will be directly involved in the sponsorship and organization of ANS Meetings and recurring international conferences, such as the 2009 ANS Annual & Winter Meetings, PHYSOR 2010, ENC 2010, ICAPP 2010, etc.

2007 Young Nuclear Engineer Award

The French Section has opened this award to French PhD students working in nuclear research laboratories at AREVA, CEA and EDF and interested in participating in ANS Topical or Annual Meetings to be held in the US.

The 2009 Young Nuclear Engineer Award was presented to [Lucas Courtigné](#) who has just graduated, ranking first, from the French Institute for Nuclear Science and Technology. He will select an ANS Meeting to be held in the US in the near future, and the grant will support his travel expenses, registration fee and accommodations during the Meeting.



The awardee, Lucas Courtigné, with ANS President Tom Sanders (left) and French Section Chair, Dominique Grenêche (right).

International Student Exchange Program

Three French students, [Antoine Petiot](#) and [Amaury Dumontier](#) from *Ecole des Mines de Paris*, and [Sylvain Gaillard](#) from *Ecole Polytechnique*, have been selected in the spring amongst other excellent candidates. Thus, the French Section has sponsored their internship: [Antoine Petiot](#) and [Amaury Dumontier](#) at Idaho National Laboratory and [Sylvain Gaillard](#) at Oak Ridge National laboratory.

New Items

The French Section has published issue No 14 of its periodical Newsletter, [SF@NS.news](#), sent by e-mail to its members and more widely 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 on the ANS website](#), dedicated to

French nuclear news and SFANS projects as well as to SF@NS.news issues, is posted on the ANS website/International Section.

The New French-Section Board

Chair: Jean-Claude GAUTHIER / Areva NP

Vice Chair: Michel DEBES / EDF

Secretary: Martine MAYOUSSE / Areva NP

Treasurer: Jean-Paul CHABARD / EDF

Board Members: Franck BOCQUET/Areva NP, France BRES-TUTINO, Frank CARRE/CEA, Rosine COUCHOUD/ Areva, Jacques de la FERTE, Dominique GRENECHE, Edouard HOURCADE/CEA, Bernard JOLLY/SFEN, Alain KAVENOKY/CEA, Boris SUPIOT/Areva NP, Dominique WARIN/CEA, Pascal YVON/CEA.



From left to right: Martine Mayousse (new Secretary), Jean-Claude Gauthier (new Chair), ANS President Tom Sanders, Rosine Couchoud, Dominique Grenêche (Past Chair), Alain Kavenoky, France Brès-Tutino, Jacques de la Ferté.



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

[R.K. Singh](#), Secretary of the Indian Nuclear Society (INS), sent the following reports:

To commemorate the Birth Centenary year of [Dr. Homi Jehangir Bhabha](#) the great visionary and founder of the Indian Atomic Energy Programme & President of the first International Conference on Peaceful Uses of Atomic Energy (organised in Geneva in 1955), the Indian Nuclear Society, the Department of Atomic Energy, and the International Atomic Energy Agency jointly organised the International Conference on “Peaceful Uses of Atomic Energy-2009” in New Delhi, 2009 September 29-October 01

Other recent INS activities:

- Conference on "Recent Advances in Molecular Imaging and Radiation Oncology" (RAMIRO-2009), 2009 January 16-17, at Tata Memorial Centre, Mumbai.
- Conference on "Recent Advances in Molecular Imaging and Radiation Oncology" (RAMIRO-2009), 2009 January 18-19, 2009 at Hotel Chancery Pavilion and National Institute of Mental Health and Neuro-Sciences (NIMHANS), Bangalore.
- INS-SFEN International Seminar on “Training and Management of Human Resources for the smooth construction and operation of a large civilian nuclear program”, organized in collaboration with the French Nuclear Society (SFEN), 2009 February 04, at NUB, NPCIL, Mumbai.
- Joint Meeting on “Radiation Treatment of Cancer in Rural Areas”, organized jointly with International Cancer Centre, Mahatma Gandhi Memorial Medical Trust, 2009 February 19.
- INS National Seminar on “Nuclear Technology in the Development of the Nation”, organized jointly with Royalseema University, Kurnool, 2009 February 21.
- Twentieth Annual General Body Meeting, in Training School Hostel, Anushaktinagar, Mumbai-400094, 2009 March 09. [Prof. P. Rama Rao, President, INS](#), presided the meeting.
- National Symposium on Recent Trends and Developments in Analytical Instrumentation and Methodologies, Hyderabad, 2009 March 18-20
- INS National Seminar on “Atomic Energy in the Development of the Nation”, organized jointly with Periyar Maniammai University, Vallam, Thanjavur, Tamilnadu, 2009 April 11.
- Theme meeting on “Nuclear Techniques for Materials Research, Industry and Society”, organized at the VCET, Madurai by Indian Nuclear Society Kalpakkam Branch.
- Seminar on “Radiation Effects in Biology and Medicine”, organized at Institute of Genetics and Hospital for Genetic Diseases, Osmania University, Hyderabad,

Andhra Pradesh, 2009 June 27.

- Webinar on “Nuclear Power for Energy Security of India” by the INS Joint Secretary Shri S.K. Malhotra, 2009 June 30.

- [Italy](#)

On Sept. 25 an official meeting was held in Rome between [ANS President Thomas Sanders](#) and the [AIN \(Italian Nuclear Association\) Presidents Renato Angelo Ricci and Maurizio Cumo](#) and other AIN representatives.

Co-Editor Mauro Bonardi provides the minutes of this meeting and other news:

The meeting was an opportunity to exchange visions and perspectives of the nuclear industry in Italy and in the USA. First, the Italian delegation remembered that many years ago, when nuclear activities were well established, the Italian Nuclear Society was authorized to operate as an ANS Local Section in Italy; the Local section Charter was signed by [ANS President Landis](#) on December 2nd, 1971! Both parties considered this long-ago event as an opportunity to strengthen links and collaboration, considering that new perspectives for nuclear are consistent at this moment in Italy.

In fact, after a five-year moratorium in 1987 (which was never reconsidered), the present Italian Government announced its intention to foster a renaissance of nuclear energy in Italy, with the vision of producing with nuclear power about the 25% of the global electric energy consumption. On last July, 29th, a law was approved by the Parliament, delegating the Government to issue decrees on siting and licensing of plants, on requirements for new projects and operators, on a new safety authority, on financial rules and instruments for an effective nuclear renaissance in the countries: in fact, all rules and standards had not evolved since 1987, considering that the sector had completely stopped.

In order also to establish grounds for international collaboration, the Government has signed agreements with France; and progress has been made for agreements with the USA. International collaboration is pursued by industry too: Enel, the most important operator, is partner (12,5%) with EdF for the construction of the EPR at Flamanville, and its participation in the following five plants is expected. Enel has also signed an MoU with EdF for the joint construction of four EPR units in Italy, the first one to be commissioned by 2020. A 50-50% dedicated company has already been incorporated for the feasibility study. Other operators are ready to enter the market.

In any case, the Italian nuclear industry has always been active during this period: while many companies provide components (also for the nuclear island) for many realizations abroad, Ansaldo Nucleare, the main company in this sector, has actively participated in many projects, namely the construction of the Cernavoda plant in Romania, and has established industrial agreements with foreign partners; special attention is now being paid to a collaboration with Westinghouse-Toshiba,

considering its previous involvement in the AP 1000 design, mainly as the passive containment is concerned.

President Sanders made an interesting presentation about global future energy needs, evidencing that significant use of nuclear power plants in “non-traditional markets” must be expected; in addition, several “emerging Nuclear Nations” could become globally competitive nuclear suppliers; in this context, and in the framework of the GNEP, it is important to consider the “Right Sizing” concept, addressing attention to small modular reactors, that can be based on the evolution of any of the current technologies.

After the meeting both delegations visited Latina NPP, a GCR, 210 MWe, which was definitely shut down in 1986 and is now in decommissioning.

Other news:

- On July 2009 the Italian Parliament definitively approved the country’s new nuclear energy program
 - The first site will be decided in 2011, in order to have the first unit operating in 2020; the other 3 units will be built at 18-month intervals
 - In the meantime the Minister of Economical Development Mr. Claudio Scajola visited the USA to discuss a cooperation agreement with Westinghouse and other organizations in the nuclear field.
- [Latin American Section \(www.las-ans.org.br\)](http://www.las-ans.org.br)

The new officers of the Section are:

Chair: [Hector E. Otheguy](mailto:otheguy@invap.com.ar), INVAP S.E., otheguy@invap.com.ar

Vice-Chair: [Odilon Antonio Marcuzzo Do Canto](mailto:odilon@abacc.org.br), ABACC, odilon@abacc.org.br

Secretary: [João José Furley Dos Santos](mailto:furley@ibqn.com.br), IBQN, furley@ibqn.com.br

Treasurer: [Jorge Spitalnik](mailto:jspitalnik@las-ans.org.br), jspitalnik@las-ans.org.br

[Jorge Spitalnik](#) sent the following report:

The annual Symposium of the Latin American Section of the ANS was held last June in Buenos Aires. The main theme of the Symposium was the Integration of Nuclear Technologies in Latin America. The Symposium was attended by government officers from the Latin American countries (Mexico, Argentina, Brazil, Chile and Uruguay), members of ABACC, and representatives of nuclear industries from the region and from North America and Europe.

[Lic. Norma Boero](#), President of the Argentine National Atomic Energy Commission) joined ANS President [Thomas L. Sanders](#) and the LAS/ANS representatives at the Opening and Closing Sessions.





Sessions were devoted to Energy Planning, Nuclear Power Generation, Human Resources Qualification and Training, Public Communication, and Medical and Industrial Applications. As in the past, the newly installed ANS President opened the meeting and delivered a plenary speech. This time Tom Sanders' presentation was devoted to Global Energy Needs: Defining a Role for a "Right Sized Reactor". Papers discussed at the Symposium can be downloaded from the LAS/ANS webpage, www.las-ans.org.br.

- [Mexico](#)

[Prof. Juan Luis François](#) of the Sociedad Nuclear Mexicana sent the following report:

On July 5-8, 2009 the Mexican Nuclear Society celebrated its 20th annual meeting in the beautiful city of Puerto Vallarta. The plenary sessions included renowned speakers including: Rafael Fernández, CFE-Laguna Verde/Mexico, Dale E. Klein, NRC/USA, Chang-Sun Kang, PNC President/Korea, Thomas L. Sanders, ANS President/USA and Sama Bilbao y León, IAEA. A round table, celebrating the 30th anniversary of the Mexican Nuclear Regulatory body (CNSNS), consisted of speeches by the Director and two former Directors of CNSNS, Javier Reig, NEA/OECD and Francisco Fernández, CSN/Spain. The more than 100 attendees enjoyed three days of technical sessions, where several sessions were dedicated to presentations about recent challenges at the two BWR units Laguna Verde Nuclear plant and the present power uprate, ongoing research at the Mexican universities and research institutions.

The 17th Pacific Basin Nuclear Conference, to be held in Cancún, México, October 24-30, 2010, will be hosted by the Mexican Nuclear Society. For more information, please visit the conference website, <http://www.pbnc2010.org.mx>.

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

[Janice Dunn Lee](#), Deputy Director General, OECD NEA, sent the following report:

NEA Strategic Plan

The NEA Strategic Plan is currently under review for updating for the next five to six year period. It is a living document that allows members to set global priorities and objectives which feed into the mandates of the NEA standing technical committees and provides guidance for the Agency's activities and Programme of Work. The

NEA is following a five step process to update the plan starting with an assessment of the current Strategic Plan, where a questionnaire was sent to Member States and major stakeholders. A High Level Advisory Group was formed and a first meeting was held to discuss the results of the questionnaire and the global context for the next plan. A Policy Debate on the new Strategic Plan which will occur on October 30, the day following the NEA Steering Committee for Nuclear Energy meeting. Following the debate, a new draft plan will be prepared for member consideration and approval in April 2010. The plan will become effective on 1 January 2011.

Nuclear Energy Agency Active on Medical Isotope Supply

The NEA has become actively involved in global efforts to ensure a reliable supply of Molybdenum-99 (Mo-99) and its decay product, Technetium-99m (Tc-99m), the most widely used medical radioisotope – and one that has been in short supply a number of times over the last few years. Following an NEA-organized workshop in January 2009 to identify supply reliability challenges and measures that should be taken to ensure reliable supplies, the NEA established the High Level Group on the Security of Supply of Medical Radioisotopes. The Group, comprised of 19 experts from 11 countries and the International Atomic Energy Agency, will oversee and assist, where necessary, efforts of the international community to address the challenges of short-, medium- and long-term medical isotope supply reliability. As part of this work, the NEA is studying the economics of the upstream Mo-99 and Tc-99m supply chain, with the goal of providing recommendations to governments on how to create a sustainable economic environment that would encourage the investments needed to ensure reliable medical isotope supplies.

Nuclear Energy and Climate Change

The NEA is working with the International Energy Agency in preparing the nuclear roadmap for their next edition of the Energy Technology Perspective (EPT) due out in 2010 which will look at different technologies and how it impacts climate change. A technology roadmap is defined by the IEA as a dynamic set of technical, policy, legal, financial, market, and organizational requirements identified by stakeholders involved in the development. The NEA is preparing a scoping paper of existing work and issues, and conducting a few brainstorming workshops and consultations with industry, government, and academia. It is expected that the NEA will be invited to join in some of the side activities of the Conference of the Parties meeting in Copenhagen in December 2009.

Multinational Design Evaluation Program (MDEP) Conference

On 10-11 September 2009, the NEA hosted the first MDEP Conference on New Reactor Design Activities. Over 170 people from 23 countries, 10 international organizations, and numerous reactor licensees, vendors, and nuclear component manufacturers participated in the event. Subjects discussed included MDEP efforts on (1) cooperation on specific design safety reviews, (2) work with various standards

development organizations on harmonization and standardization of requirements, and (3) the coordination of vendor inspections of reactor pressure vessels manufacturers. Stakeholders such as industry representatives, other regulatory bodies and organizations such as WENRA and the IAEA provided their views of new reactor issues and recommendations for the MDEP. The Conference was chaired by Andre Claude Lacoste, Chairman of the French nuclear safety authority (ASN). Dr. Gregory Jaczko, appointed Chairman of the US Nuclear Regulatory Commission in May 2009, was attending his first MDEP conference. Dr. Jaczko stressed the importance of the MDEP for enhancing nuclear safety globally.

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

The Pacific Nuclear Council is looking forward to its 17th Pacific Basin Nuclear Conference, which will be hosted in 2010 October in Cancún by the Sociedad Nuclear Mexicana.

- [Spain](#)

[José Luis Elviro](#), General Secretary of the Sociedad Nuclear Española, sent the following report:

Finally, the Spanish government has decided not to renew the operating license of the **Santa María de Garoña nuclear power plant** after 2013 July. *Santa María de Garoña* is a BWR Nuclear Power Plant of 466 Megawatts, located in the North of Spain, in the province of Burgos. It was manufactured by General Electric USA (GE) and has been in operation since 1971. Following the process established in the Spanish legislation for the license renewal of the NPP, the electricity utilities Endesa and Iberdrola, who operate the plant under a joint venture known as Nuclenor, began some years ago a plan of investments oriented to the life extension of the plant with a continuous update program to fulfill the rules applicable to the new construction NPP. The *Consejo de Seguridad Nuclear* (CSN), the Spanish regulatory body, agreed unanimously to submit a report to the government with a non-binding recommendation that the *Santa María de Garoña* nuclear power plant operate beyond its original 40-year lifespan for another 10 years. But the government has decided not to follow this recommendation.

The power plant board of directors has presented a judicial review against the government's decision. Professional associations, plant workers and other organizations are also expressing their opinions supporting the plant continuity.



The **35th Annual Meeting of the Spanish Nuclear Society** will be held in Seville, Barceló Renacimiento Hotel, from 28 to 30 of October of 2009. The meeting program includes plenary and technical sessions. The Plenary sessions will be devoted to “Spanish Energy Perspective for 2030” and “New Nuclear Programs”. The Technical Sessions will cover the three days of the Annual Meeting and will be grouped by topic. During these sessions nuclear professionals from Spain or other countries will highlight their latest work. The Technical topics in the 35th Annual Meeting are the following: fuel, communication, dismantling, fusion, R+D, engineering, maintenance, nuclear medicine and other applications, new reactors, NPP operation, management and human factors, radiological and environmental protection, nuclear waste and nuclear safety. More than 230 presentations will be presented in the Technical Sessions, and more than 400 representatives of different companies, universities and institutions related to this sector are registered for the meeting this year.

In the commercial exhibition established in parallel, twenty-seven companies and institutions will present the principal innovations in their activities during the three days of the meeting. This exhibition will be held in the Barceló Renacimiento Hotel.

- [USA](#)

[Prof. Patricia Paviet-Hartmann](#), of the University Nevada-Las Vegas and Harry Reid Center for Environmental Studies, sent the following report:

A symposium entitled “Separation for application to the nuclear fuel cycle, in Memory of Dr. Charles Madic”, will be held at the 239th American Chemical Society National Meeting in San Francisco, CA, March 21-25, 2010. Prof. Charles Madic passed away last year. The symposium is being organized to honour Prof. Madic’s his international contribution in the field of the separative chemistry of the actinides.

As more countries consider nuclear power, it is important that key topics such as R&D on future fuel cycles, waste management and integrated science repository being presented and discussed for a sustainable development of nuclear energy. One of the major objectives of this symposium is not only to bring nuclear scientists but also to promote networking between countries, institutions, graduate students and potential next generation leaders. To raise awareness of activities and capabilities within the international actinides/radionuclides science community, this symposium will cover research topics that encompass nuclear fuel fabrication, nuclear fuel treatment and reprocessing as well as a comprehensive understanding of processes governing the behavior of nuclear wastes in storage and final disposal. Researchers and engineers involved in advanced research in actinide sciences for further development of a dynamic, competitive and sustainable knowledge-based nuclear industry are encouraged to attend.

The symposium is being organized by [Dr. Laetitia Delmau](#) of Oak Ridge National

Laboratory and [Prof. Patricia Paviet-Hartmann](#).

The Radiochemistry Ph.D. program at the University of Nevada, Las Vegas involves a number of colleges and academic/research units across the UNLV campus and is dedicated to excellence in education and research. The program is research intensive and the curriculum requires 60 credits in the classroom and laboratory beyond the baccalaureate degree in addition to an original research doctoral thesis.

- [Vietnam Atomic Energy Institute \(VAEI\)](#)

[Vu Dang Ninh \(vudangninh@hn.vnn.vn\)](#), Director, Administration Department of the Vietnam Atomic Energy Institute (VAEI) has sent notice that the Vietnam Atomic Energy Commission (VAEC) changed its name to the Vietnam Atomic Energy Institute (VAEI). [Prof. Dr. Vuong Huu Tan, vuonghuutan@hn.vnn.vn](#), is the President of VAEI.

- [World Nuclear University](#)

The World Nuclear University's Fifth Annual Summer Institute was held in Christ Church, University of Oxford, England, 2009 July 5 - August 15.

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, typically gleaned from the Divisions' web pages.

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

The ANFM-IV conference, organized by RPD, was a resounding success. There were 28 technical sessions covered in 4 parallel tracks over 3 days, which included 112 papers, 3 technical panels ("World Perspective on Nuclear Fuel Management Needs," "Adequacy of Methods for Nuclear Fuel Management," "Zero by Ten – Zero Fuel Leakers by 2010"), and a workshop on the SCALE Lattice Physics. The meeting attracted more than 200 registered participants and their guests and the most common congratulatory remark was: "why do you folks not have this meeting more often?!"

The next PHYSOR Topical Meeting will be held in Pittsburgh the week of May 9-14, 2010. In light of the nuclear renaissance, PHYSOR 2010 aims to provide a platform for international experts to exchange ideas and latest developments in reactor physics and related nuclear technologies. This conference is co-sponsored by the ANS Mathematics and Computation Division and the American Society of Mechanical Engineers (ASME).

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



NURETH-13 (13th International Topical Meeting on Nuclear Reactor Thermal Hydraulics) has just been held (Sept. 27-Oct.27) in Kanazawa, Japan. It was organized by the Atomic Energy Society of Japan and other Japanese institutions. The theme of the conference was “Professionalism Ever Onward”. NURETH-13 was dedicated to the memory of the late [Prof. Mamoru Akiyama](#).



THD is now looking forward to NURETH-14, which will be organized by the Canadian Nuclear Society and will be held in Toronto, Ontario, Canada, 2011 September 25-29. The theme of NURETH-14 will be “Helping the Environment with Advances in Thermalhydraulics”.

- [ANS Young Members’ Group \(YMG\) \(http://ymg.ans.org\)](http://ymg.ans.org)

[George Tsakanikas](#), Chair of the ANS YMG, sent the following report:

The Young Members Group is excited to be hosting its first embedded topical, the Young Professionals Congress (YPC, <http://www.ans-ypc.org>) 2009, at this year’s Winter Meeting in Washington, DC. Many volunteers from both the ANS and North American Young Generation in Nuclear (NA-YGN) have worked hard to build a balanced program of technical sessions, professional development workshops, and tutorial seminars. We are also happy to present meeting attendees with the opportunity to meet with members of Congress and the House of Representatives, to discuss the importance of nuclear science and technology, during our Capitol Hill Visit on the last day of the Winter Meeting. In other news, YMG is continuing to strengthen and grow as a group. We are working to improve our young member involvement with codes and standards through the Associate Member program and to continue building working relationships with the other divisions through our YMG Liaisons program. YMG would like to take this opportunity to thank everyone who has supported us over the past few years as we’ve established ourselves within the society.

Highlights from the 2009 June Meeting in Atlanta

Highlight 1: [Dr. Corey McDaniel](#) gave a remarkable presentation on “Perspectives from Washington D.C.: A view from Capitol Hill”.

[Dr. McDaniel](#) has served, since 2005, as [Senior Policy Advisor](#) for Energy, Environment and Natural Resources for three US senators: [Jim Risch](#) from Idaho,

John Kyl from Arizona and Larry Craig of Idaho, retired (Risch's predecessor). As Advisor to Senator Kyl, Dr. McDaniel helped craft key nuclear energy sections of the 2005 Energy Policy Act as well as sections of the 2007 Energy Independence and Security Act.

Dr. McDaniel currently serves as the Legislative Director to Senator Risch, managing the Senator's role as the Senior Republican on the Foreign Relations Subcommittee on Near Eastern, South and Central Asian Affairs. His responsibilities also include oversight of funding for the Idaho National Laboratory and relationship with relevant Federal Agencies.

Highlight 2: Presentation from the Bulgarian Nuclear Society

This very interesting picture of the nuclear-power sector in Bulgaria, "Update on the Bulgarian Energy Program and on the BgNS", was presented by Prof. Pavlin Groudev, Associate Professor and Head of the "Nuclear Energy and Nuclear Safety" Laboratory and Deputy Director of the Institute for Nuclear Research and Nuclear Energy – Bulgarian Academy of Sciences.



A "digest" of this presentation is reproduced here.

Outline

- Introduction
- Nuclear Energy Policy of Bulgaria
- Long-term Power Development Plan
- Bulgarian Nuclear Power Profile
- Public Acceptance
- BgNS Aims and Activities in the Energy Program
- References

Introduction

- Country name: **Republic of Bulgaria**
- Location: South-Eastern Europe
- Area: 110 912 sq. km
- Population: 7 679 290 (for 2006)

Bulgarian energy sector is defined by the United Nations Conference on Trade and Development investment card as the second most competitive for investments in the world, after the Brazil energy sector.

In 2006 the ongoing energy projects in the energy sector were financed by a total sum of 3,6 mlrd. EUR and by the end of 2007 the investment finances were expected to exceed 8 mlrd. EUR. A significant part of them, are implemented by public and private companies without state guarantees.



Nuclear Energy Policy of Bulgaria:

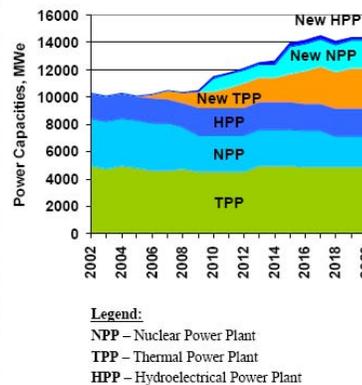
- Energy strategy of Bulgaria accepted in 2002
- National plan for development by 2013
- Strategy for management of spent nuclear fuel and radioactive waste
- Plan for development of energy sector in Republic Bulgaria with minimal cost for 2006-2020;
- Kozloduy NPP business-plan for 2006-2009

The main guidelines in the field of nuclear energy and nuclear safety, as specified in the Energy Strategy of Bulgaria from 2002, are:

- harmonization of the national legislation with the European one in the field of nuclear energy;
- development of nuclear energy in compliance with the latest requirements on safety, efficiency, reliability, nuclear safety and radiation protection;
- clearly comprehensive legislation in the area of nuclear safety and radiation protection, strict licensing regime, availability of sufficient resources and technical support of the regulatory body;
- operation of the existing nuclear facilities in accordance with the requirements for high level of safety and implementation of the internationally recognized operational experience.
- Strategy for Spent Fuel and Radioactive Waste Management. Defines country programs on management of low and intermediate level waste, management of spent fuel and management of high level waste
- The country long-term energy policy will be directed to achievement of low carbon structure of the energy balance through nuclear-energy development.



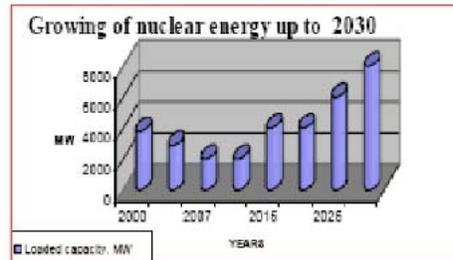
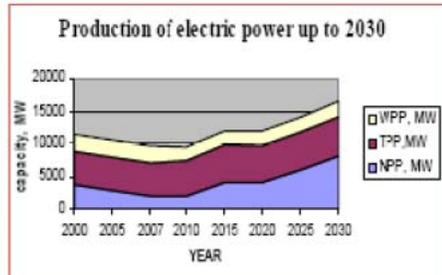
Long-term Power Development Plan



- Bulgarian and Regional Low Cost Plans
- Energy Strategy of Bulgaria
 - Security of supply
 - Diversity of electricity generation
 - Global warming
 - Electricity market liberalization
 - Electricity export to the region
- Alternative options of Nuclear Power Development
 - Plant Life Extension
 - Belene NPP Completion
 - New NPP units at Kozloduy Site
 - New NPP units at Belene Site

New Energy Strategy

- KOZLODUY NPP Units 7&8 2021-2023 year
- BELENE NPP Units 3&4 2028-2030 year



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Bulgarian Nuclear Power Profile in 2008

- **Kozloduy NPP**
- Reactor type WWER 6 units
- Units 1&2 Shutdown in 2002
- Units 3&4 Shutdown in 2006
- Units 5&6 In operation
- Power 2000 MW(e)
- Reactor years operational experience 141
- Status Operational license
- Additional Information: www.kznp.org
- **Belene NPP**
- Reactor type PWR BBEP-1000/B466
- Plant supplier ASE, AREVA NP
- Reactor thermal power 3012 MW
- Electrical output 1049 MW
- Design life time 60 years
- Additional Information: www.belene-npp.com

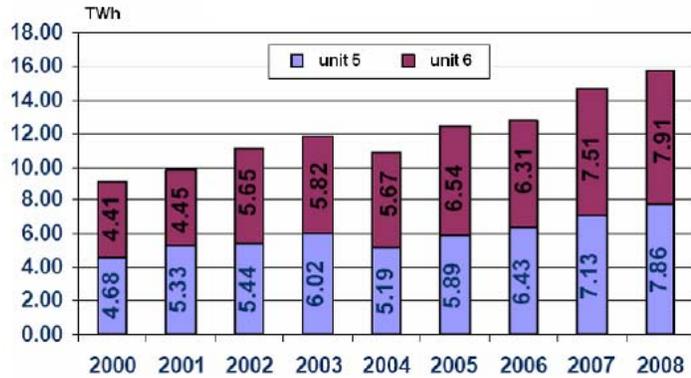


- **State Enterprise "Radioactive Waste" Division "Kozloduy"**
- Processed RAW 1500 m3
- Capacity 21420 m3
- Status Operational license for 3 years
- **Division "Novi Han"**
- Capacity 600 m3
- Status Operational license for 3 years
- Additional Information: www.dpraobg/

2009 ANS Annual Meeting
Atlanta, GA, USA

June 14, 2009

Kozloduy Nuclear Power Plant Electricity Producing (2000 - 2008)



2009 ANS Annual Meeting
Atlanta, GA, USA

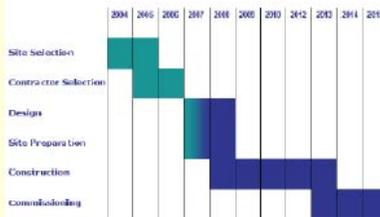
June 14, 2009

Belene Nuclear Power Plant

Licensing Status

- **Pre-project Phase**
 - Data Gathering 2002-2003
 - Feasibility Study 2003-2004
 - Environmental Impact Assessment 2003-2004
 - EIA Approval November 2004
 - Public Hearings 2004-2005
- **Site Selection Phase**
 - Site Selection Application August 2004
 - Site Selection Permit December 2004
 - Site Selection Phase 2004-2006
 - Site Approval Order December 2006
- **Design Phase**
 - Design Application October 2005
 - Design Permit May 2007
 - Design Phase 2007-

Project Schedule



2009 ANS Annual Meeting
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Design Certification of the Belene Power Plant:

- VVER AES 92 Design has successfully passed all the steps of the analysis of compliance with European Utility Requirements for LWR Plants for 1998-2006
- VVER AES 92 Design was certified in April 2007 (by *European Utility Requirements for LWR Plants*)

Reconstruction of the research reactor IRT-2000 in a low power reactor-200 kW



The research reactor IRT-2000 will be reconstructed into a reactor of power 200 kW. The use of lowenriched uranium fuel, with uranium-235 enrichment below 20%, is in accordance with the current norms on the security of transport and storage of nuclear and other radioactive materials which are vulnerable to theft by terrorists. The reconstruction should be finished in the end of 2010.

The following experimental channels are planned::

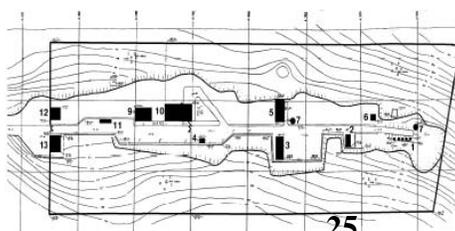
- two vertical channels in the fuel assemblies to supply fast neutron flux $3.1012 \text{ n/cm}^2\text{s}$;
- two vertical channels in beryllium blocks to supply thermal neutron flux $8.1012 \text{ n/cm}^2\text{s}$;
- seven horizontal channels outside the aluminium vessel of the reactor core with fast neutron flux $1,6.1012 \text{ n/cm}^2\text{s}$, and thermal neutron flux $5.1011 \text{ n/cm}^2\text{s}$ on the core vessel;
- six vertical channels outside the aluminium vessel of the reactor core with fast neutron flux $2.1012 \text{ n/cm}^2\text{s}$, and thermal neutron flux $7.1010 \text{ n/cm}^2\text{s}$ on the core vessel;
- channel for BNCT with epithermal neutron flux $0,9.109 \text{ n/cm}^2\text{s}$.

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Novi Khan Radioactive Waste Repository

Novi khan repository has been built as RADON type facility

- disposal vault for solid waste – 237 m³
- disposal vault for sealed sources – 1 m³
- storage tanks for liquid waste – 48 m³
- disposal vault for biological waste – 80 m³
- engineered trench for solid waste – 200 m³
- temporary storage of smoke detectors and low level waste (LLW) 462 m³
- temporary storage of spent sealed sources – 322 m³
- temporary storage of vault LLW 330 m²



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Management of Radioactive Waste (RAW) Generated at Kozloduy NPP

For safe RAW (without spent fuel) management a Complex for RAW treatment and storage has been constructed.

- Complex for treatment and storage of RAW
- RAW treatment plant



Radioactive Waste Treatment Plant

“Solid” waste treatment line

- Solid RAW receiving and reloading junction;
- Sorting table;
- Two 50 - tones pre-compactors;
- A lidding machine for 210 litter drums;
- A radionuclide contents measuring system – CANBERRA;
- Super compactor 1000 tones;
- Crane – manipulator;

“Liquid” waste processing line

- A special transport tanker-trailer for transportation the liquid RAW from the temporary storage in the Auxiliary Buildings 2;
- Unloading section for LRAW;
- Two receiving tanks for non concentrated LRAW - 40m³ each;
- “LUWA” evaporator - capacity 38 l/min;
- Two receiving tanks (20 m³ each) for cement and chemical additives;
- Mixer for cement + addition + liquid waste;

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National RAW Disposal Facility (Near Surface Disposal Facility for LLRW and ILRW)

- National RAW Strategy approved by the Government in 2004
- Near Surface Disposal Facility for LLRW and ILRW in 2015
- National RAW Disposal Facility
- Conceptual Design Phase 2006-2007
- Site Selection 2006-2008
- Environmental Impact Assessment Report 2007-2008
- Design and Construction Phase 2009-2014
- Planned Commissioning in 2015



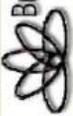
- NRAW disposal facility shall be modular type, stepwise increasing of the capacity
- NRAW disposal facility shall be near surface disposal facility close to the surface
- NRAW disposal facility shall be engineered multibarrier disposal facility
- Assured possibility for implementation of corrective measures – modification of engineered barriers and/or retrieval of waste packages
- Institutional control period – no more than 300 y
- Operational period – 25 years
 - Start of operation – 2015
 - Operation of the facility – until 2040
 - Closure – after 2040

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Dry Spent Fuel Storage Facility

(Long Term Storage of Spent Nuclear Fuel Assemblies at Kozloduy)

Key Requirements

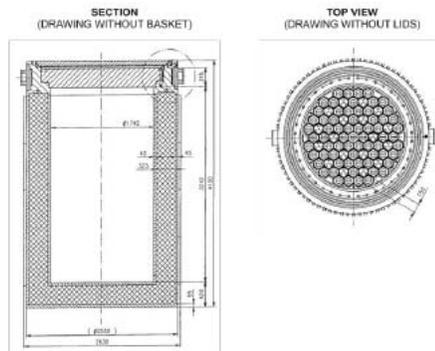
- To provide the necessary free capacity for removal and storage of the spent nuclear fuel assemblies resulting from the decommissioning of units 1 and 4 at Kozloduy NPP. (Initial stage for keeping 2800 VVER 440 Fuel Assemblies with expansion capability to keep up to 8000 VVER 440 and 2500 VVER 1000).
- To avoid interruption of the remaining operational units at Kozloduy NPP by providing adequate free capacity in the spent fuel pools for acceptance of irradiated nuclear fuel from the operating units .
- To ensure the safe long term storage of spent nuclear fuel assemblies for a period not less than 50 years .
- To allow future safe retrieval of the spent fuel for transport from the storage facility
- To ensure the cladding temperature does not exceed 330°C .

Dry Spent Fuel (DSF) Storage Facility

(long term storage of spent nuclear fuel assemblies at Kozloduy)

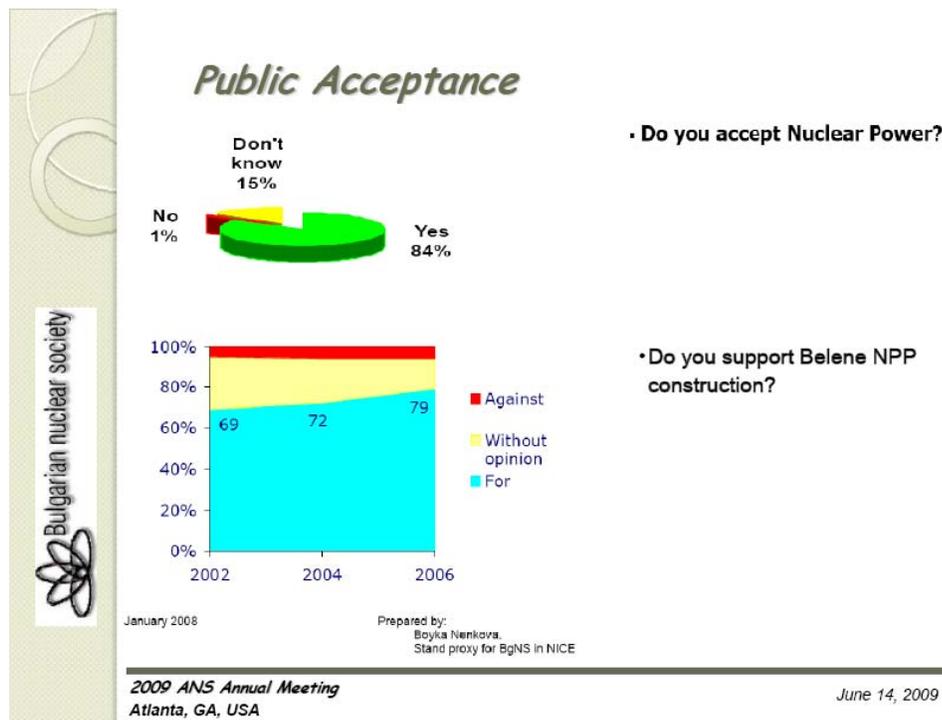
Technology Selected

- The storage technology proposed for the DSF comprises a cask storage system with natural convection air cooling. Two different cask types suitable for storage of irradiated fuel from VVER-440 and VVER-1000 reactors are proposed.
- CONSTOR®440/84 casks will be used to store the VVER-440 spent fuel assemblies. Each CONSTOR®440/84 cask has the capacity to store 84 VVER-440 spent fuel assemblies.
- CONSTOR®1000/19 casks will be used to store the VVER-1000 spent fuel assemblies. Each CONSTOR®1000/19 cask has the capacity to store 19 VVER-1000 spent fuel assemblies
- The cask body consists of a sandwich structure with an outer liner and an inner liner of steel. CONSTORIT (granulated material with cement slurry) intermediate layers as well as tension bolts (on the bottom side of the cask) are placed between the outer and inner liners



Conferences in the Field of Energy in 2008

- International Conference “Bulgarian Nuclear Energy – National, Regional and World Safety”, organized by BULATOM in cooperation with BgNS was held in Riviera complex, Varna, 28 - 30 May 2008;
- Energy Forum with International Participation on different energy topics, including nuclear energy development was held in St. “Constantine and Helena”, Seaside resort, Varna, 11 - 14 June 2008, organized by the Scientific and Technical Union of the Power Engineers, Ministry of Economy and Energy, NEC, Ministry of Environment and Waters and Technical University, Sofia;
- Annual Conference of BgNS with International Participation - “Nuclear Power for the People - Nuclear Installations Safety and Environment” was held in Grand Hotel Sofia, 3 – 5 November 2008.
- BgNS and INRNE-BAS are co – organizers of more than 10 conferences annually in the field of Nuclear Physics and Nuclear Energy.



BgNS General Information:

The BgNS was founded in August 1, 1991. The Bulgarian Nuclear Society (BgNS) is a volunteer society of individuals and corporate bodies, joint in virtue of their professional interests in the field of science, technologies and practice on the peaceful uses of nuclear energy.

The Bulgarian Nuclear Society aims to contribute to the versatile development of the science, technologies and practice on the safety use of atomic energy for peaceful purposes, and to help the public better understand the benefits of nuclear technology. See for more information at <http://www.bgns.bg/Information.htm>.

Membership in the BgNS:

The BgNS has individual:

- Regular members
- Associate members
- Corresponding members
- Honorary members

BgNS comprises more than 400 professionals from power stations, research centers, scientific and engineering organizations and authorities, working for the progress of nuclear industry.

BgNS corporate members:

- KOZLODUY NPP
- BELENE NPP
- INRNE-BAS
- FRAMATOME
- EQE BULGARIA
- RISK ENGINEERING Ltd
- ENPRO CONSULT Ltd
- THETA CONSULT Ltd
- ATOMENERGOPROEKT
- INSTITUTE OF ENERGY
- QUANTUM ENGINEERING Ltd.
- ONET TECHNOLOGIES BULGARIA
- EMCO-JSC, BELENE
- BELENE MUNICIPALITY
- MARIE SKHODOWSKA – CURIE NUCLEAR ENERGY PROFESSIONAL HIGH SCHOOL, BELENE ENEMONA Ltd

Activities of the BgNS:

- Organization and support of the events like conferences, seminars, workshops, training and specialized courses to encourage the professional skill in the field of nuclear. Contribute the participation of its members in such events.
- Issues publications and other literature on the science and technical matters in all aspects of nuclear.
- Organization and support of the events (lectures, public speaking, public discussions, educational materials, media conferences, etc.) aiming to make popular nuclear matters and issues, addressed to the opinion forming audiences, decision makers and general public including young people.
- Organizes expert teams to perform expertise and attitudes on issues, connected with nuclear energy and other aspects of nuclear applications.
- Cooperates and associates with other national and international societies.
- Any other appropriate legal activities to ensure the achievement of the BgNS aims.

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.nuc.elf.stuba.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.)

2009

- 27-30 October: International Conference on Opportunities and Challenges for Water Cooled Reactors in the 21st Century, Vienna, Austria – <http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=35251>
- 13-15 November: India Nuclear Energy Summit 2009, “Nuclear Energy in India – Vision 2050”, Mumbai, India – <http://www.indianuclearenergy.net>
- 15-19 November: ANS Winter Meeting and Nuclear Technology Expo, Washington, DC, USA – <http://www.ans.org/meetings>
- 15-19 November: 2009 Young Professionals Congress (YPC2009) Washington, DC, USA – <http://www.ans-ypc.org>
- 25-26 November: Clean Energy Trends Asia 2009, Shanghai, China, <http://www.cleanenergysummit.net>
- 7-11 December: International Conference on Fast Reactors and Related Fuel Cycles – Challenges and Opportunities, Kyoto, Japan; organized by the International Atomic Energy Agency and hosted by the Japan Atomic Energy Agency (JAEA) –

2010

- 7-11 March: Mixed, Hazardous Wastes & Environmental Management Conference (WM2010), Phoenix, AZ, USA – <http://www.wmsym.org>
- 21-24 March: 1st International Nuclear & Renewable Energy Conference (INREC'10), Amman, Jordan – <http://inrec10.inrec-conf.org>
- 21-25 March, Symposium “Separation for application to the nuclear fuel cycle, in Memory of Dr. Charles Madic”, San Francisco, CA. The Program and Abstract Creation System (PACS) is at <http://abstracts.acs.org>.
- 8-11 April: ANS Student Conference 2010, “Coming Together to Split the Atom”, University of Michigan, Ann Arbor, MI, USA – <http://www.studentans2010.org>
- 19-23 April: 2010 RPSD, IRD and BMD Joint Topical, Las Vegas, NV, USA – <http://local.ans.org/nv/jtm2010.html>
- 26-30 April: ND2010, “The 2010 International Conference on Nuclear Data for Science and Technology”, Jeju Island, Korea – <http://www.nd2010.org>
- 9-14 May: PHYSOR 2010, “Advances in Reactor Physics to Power the Nuclear Renaissance”, Pittsburgh, PA, USA – <http://www.physor2010.org>
- 24-27 May: 31st Annual Conference of the Canadian Nuclear Society and 34th CNS/CNA Student Conference, Montréal, Québec, Canada
- May: International Conference on Nuclear Data for Science and Technology (ND-2010), Jeju, Korea – <http://www.nd2010.org>
- 30 May - 3 June: ENC 2010, European Nuclear Conference 2010, Barcelona, Spain – <http://www.euronuclear.org>
- 13-17 June: ANS Annual Meeting, San Diego, CA, USA – <http://www.ans.org/meetings>
- 8-11 August: Utility Working Conference, Amelia Island, FL, USA – <http://www.ans.org/meetings>
- 8-13 August: ASME International Heat Transfer Conference (IHTC-14), Washington, DC, USA – <http://www.ans.org/meetings>
- 15-18 August: Uranium 2010, 3rd International Conference on Uranium and 40th

Annual Hydrometallurgy Meeting, Saskatoon, Saskatchewan, Canada – <http://www.metsoc.org/u2010/>

- 29 August – 2 September: Decommissioning, Decontamination and Reutilization, DDR 2010, Idaho Falls, ID, USA – <http://ddrtopical2010.org>



- 19-23 September: Plutonium Futures 2010 – The Science, Bloomfield, CO, USA – <http://www.ans.org/meetings>
- 26-29 September: LWR Fuel Performance Meeting/ Top Fuel, Orlando, FL, USA – <http://www.ans.org/meetings>
- 3-7 October: Tenth International Topical Meeting on Nuclear Applications of Accelerators (AccApp '10), Knoxville, TN, USA – <http://www.ans.org/meetings>
- 3-7 October: ICEM'10, “13th International Conference on Environmental Remediation and Radioactive Waste Management”, Tsukuba, Japan; contact: icem10@numo.or.jp
- 3-10 October: International Conference on Water Chemistry of Nuclear Reactor Systems (NPC 2010), Québec City, QC; organized by Canadian Nuclear Society (<http://www.cns-snc.ca>)
- 3-10 October: Tenth International Topical Meeting on Nuclear Applications of Accelerators (AccApp '10), Knoxville, TN – <http://www.nd2010.org>
- 24-28 October: 9th International Conference on Tritium Science and Technology (TRITIUM-2010), Nara, Japan – E-mail uda.tatsuhiko@nifs.ac.jp
- 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>
- 14-18 November: ANS Winter Meeting and Nuclear Technology Expo, New Orleans, LA, USA – <http://www.ans.org/meetings>



2011

- 13-16 March: 5th International Symposium on Supercritical-Water-Cooled Reactors, Vancouver, Canada – <http://www.cns-snc.ca>
- 13-17 March: International Topical Meeting on Probabilistic Safety Assessment and

Analysis (PSA 2011), Wilmington, NC, 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.ans.org/meetings>
- 11-15 September: Canadian Nuclear Society Waste Management Conference 2011, Toronto, Ontario, Canada - <http://www.cns-snc.ca>
- 18-23 September: International Nuclear Chemistry Congress (3d-INCC), Città del Mare, Palermo, Sicily, Italy – Contact: Flavia.Groppi@mi.infn.it
- 25-29 September: 14th International Topical Meeting on Nuclear Reactor Thermalhydraulics (NURETH-14), Toronto, Ontario, Canada – <http://www.cns-snc.ca>
- 30 October-3 November: ANS/ENS International Winter Meeting and Nuclear Technology Expo, Washington, DC, USA – <http://www.ans.org/meetings>



2012

- 24-28 June: ANS Annual Meeting, Chicago, IL, USA – <http://www.ans.org/meetings>
- September: 8-th International Conference of Nuclear and Radiochemistry (NRC-8), Lake Area, North-East Italy, Chairman Mauro.Bonardi@mi.infn.it, <http://wwwGIR.mi.infn.it>
- 11-15 November: ANS Winter Meeting and Nuclear Technology Expo, San Diego, CA, USA – <http://www.ans.org/meetings>

2013

- 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>

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