

Activity Report

July 2000

Office of International Nuclear Safety and Cooperation - Dr. James Turner, Director
Improving the Safety of Soviet-Designed Nuclear Power Plants

Kozloduy completes thermal-hydraulic analysis for EOI validation

Highlight

Kozloduy nuclear power plant (NPP) and its analytical support organizations Energoproekt and the Institute of Nuclear Reactors and Nuclear Energy (INRNE), have completed the thermal-hydraulic validation of the symptom-based emergency operating instructions (EOIs) for Kozloduy's VVER-1000 reactor units. On July 4, the EOI team from Kozloduy NPP reported that plant management had given approval to the final report that summarizes the results obtained from more than 18 months of analytical work. All work was done with Bulgarian resources using site-specific Kozloduy VVER-1000 RELAP5 computer codes. Specialists from Data Systems & Solutions (DS&S) and Pacific Northwest National Laboratory served as mentors for the Bulgarian analysts. The EOI team now will incorporate the results of the analysis into the EOIs and prepare a submittal to the Bulgarian regulatory agency. Having completed this significant analytical obstacle, the remaining activities required to support implementation are final verification and simulator validation of the EOIs and operator training. Final implementation of EOIs for Kozloduy Units 5 and 6 is expected in early 2001.



Key members of the EOI team for Kozloduy NPP include (from left) Emo Popov, Energoproekt; Stoyan Kalchev and Peter Demerdjiev, Kozloduy NPP; and Pavlin Groudev, Institute of Nuclear Reactors and Nuclear Energy.



The purpose of the thermal-hydraulic analysis is to prove, or validate, the adequacy and effectiveness of the mitigating strategies contained in the approximately 50 symptom-based Kozloduy EOIs under all transient conditions. By following a best-estimate bounding analytical methodology devised by Pacific Northwest National Laboratory and its contractor DS&S, Kozloduy NPP reduced the original estimated level of effort for the EOI analysis by approximately 75 percent. This new reduced and highly efficient scope was both manageable and cost effective.

By consolidating their analytical scope into 13 “bounding modes” (e.g., large-break loss-of-coolant accident, total loss of electrical power, steam generator tube rupture, total loss of feedwater) that summarized the most severe challenges to the critical safety functions (i.e., subcriticality, core cooling, heat sink, containment, integrity, and inventory), the team reduced the number of scenarios that needed to be analyzed from the originally estimated 450 to 475 scenarios to 125 to 150 scenarios. These scenarios described bounding plant conditions, transient sequences, and operator actions that occur during these 13 bounding mode initiating events. By analyzing plant responses with and without operator actions during the sequence of events that lead to the most severe challenges to the six critical safety functions, mitigating strategies in the approximately 50 EOIs could be validated, thus validating the same strategies used for less significant transients.



Members of the Kozloduy EOI team pause on their way to a meeting at the plant-owned hotel in Pomparova, Bulgaria; (back row, left to right) Alexander Krastev, Uli Hristov, Pavlin Groudev, Stoyan Kalchev, Kent Faris, Pacific Northwest National Laboratory; and Ron Beelman, Science Applications International Corporation; (front row) Krassimer Avdjiev, Diana, Vladimir Uruchev, and Elizabet Tcvetanova.



***DOE's Dr. James Turner
and Secretary of
Energy's Advisory Board
visit Russian nuclear
organizations***

***Project team assesses
progress on Smolensk
safe-shutdown analysis***



The team now turns its attention to the thermal-hydraulic analysis to validate the EOIs for Kozloduy's VVER-440/230 reactors. Now approximately 25 percent complete, the VVER-440/230 work should be finished later this year. (Dennis Meyers, DOE, 301-903-1418; Kent Faris, PNNL, 509-372-4068) v

Russia

Dr. James Turner, Director of the Office of International Nuclear Safety and Cooperation in the U.S. Department of Energy, traveled to Moscow and Leningrad NPP July 23 through 28. The visit provided an opportunity for Dr. Turner to meet with key nuclear power organizations in Moscow. In addition, Dr. Turner was able to support the activities of a concurrent visit to Moscow and Leningrad NPP by the Secretary of Energy's Advisory Board (SEAB), which was reviewing DOE safety activities in Russia.

Meetings were held at the Russian International Nuclear Safety Center, which supports research related to nuclear safety; Gosatomnadzor, the nuclear regulatory agency in Russia; the Kurchatov Institute, a scientific center involved in nuclear plant design and research; Rosenergoatom, a business sector of MinAtom, responsible for all nuclear power plant operations in Russia except at Leningrad; the Russian Institute for Nuclear Power Plant Operations (VNIIAES); and MinAtom, the major agency with oversight of nuclear-related activities in Russia; and at Leningrad NPP. (Rich Reister, DOE, 301-903-0234; Bob Moffitt, PNNL, 509-372-4108) v

A progress meeting on the Smolensk safe-shutdown analysis project was held July 17 through 20 at the offices of Engineering Planning and Management Inc. (EPM) in Boston, Massachusetts. Analysts from VNIIAES, Atomenergoprojekt, and Rosenergoatom, as well as technical specialists from EPM and Brookhaven and Pacific Northwest national laboratories, participated. They reviewed reports covering the probabilistic portion of the analysis and the recommendations for fire safety upgrades to correct identified deficiencies. The Russian working group indicated a need for fire frequency information to complete the probabilistic analysis portion of the overall study. The U.S. team will supply the Russian group with information on the frequency of fires in U.S. operating nuclear reactors to provide a basis for estimating fire frequencies for Smolensk NPP.



Reviewing progress on the Smolensk safe-shutdown study were (left to right) Andrew Minister, Pacific Northwest National Laboratory; Robert Kalantari, EPM; Rich Denning, Pacific Northwest National Laboratory; Ali Azarm, Brookhaven National Laboratory; Vladimir Morozov, Atomenergoprojekt; Yulia Rummyantseva, Rosenergoatom; Mike Archdeacon, Bechtel National; and Guerman Soldatov, VNIIAES.

The project team is planning a workshop to present the results of the Smolensk safe-shutdown analysis and to discuss the fire safety of other operating nuclear reactors in Russia. That workshop will be held in Moscow in October 2000. (Grigory Trosman, DOE, 301-903-3581; Andrew Minister, PNNL, 509-376-4938) v

***Committees review
progress on Leningrad
in-depth safety
assessment***

The steering and technical committees for the in-depth safety assessment under way at Leningrad NPP met at the offices of ES-Konsult (Stockholm, Sweden) and Leningrad NPP (Sosnovy Bor, Russia) during the week of July 17. Project technical members meet regularly to assess and address project production and technical issues. Meeting participants included representatives from ES-Konsult, Leningrad NPP, and Pacific Northwest National Laboratory. Key meeting topics included development of a safety concept production plan and near-term tasks related to the development of EOIs.

The safety concept chapter is a critical element in producing the overall in-depth safety assessment. It summarizes a significant portion of the assessment's technical material marking the end of the technical production of nine deterministic, probabilistic, engineering, and institutional studies. Pacific Northwest National Laboratory coordinated the development of a production plan for the safety concept reports. The plan, approved by a signed protocol, involved participation of representatives from Sweden, Finland, Great Britain, Russia, and the United States. Coordinating activities took place at meetings at both ES-Konsult and the in-depth safety assessment bureau office for Leningrad NPP.

In meetings with Leningrad NPP's training department, participants considered the use of reference materials developed for the in-depth safety assessment for future training activities. The training department is interested in using the assessment's



***Rivne safety assessment
work resumes under new
management***

***Physical security
upgrades under way at
Khmelnyskyy***



deterministic analysis to benchmark the performance of its recently competed simulator system description reports as training reference material. Training department representatives agreed to review the scope of the safety assessment database to ensure parity with the system nomenclature and boundaries. Leningrad's deputy chief engineer will involve the training department in future in-depth safety assessment production meetings. (Walter Pasedag, DOE, 301-903-3628; Sam McKay, PNNL, 509-372-4059) v

Ukraine

In late June, the U.S. technical coordinator for the plant in-depth safety assessment participated in the first project review meeting planned and led by Rivne NPP to facilitate and coordinate the restart of activities related to the plant safety assessment. Rivne NPP now plays a greatly enhanced role as Ukrainian manager of the Rivne safety assessment. Participation by plant technical staff also is expanded. Enthusiasm for the new arrangement was evidenced by the fact that every member of the Ukrainian team attended the June 28 review meeting even though it was a national holiday (Constitution Day).

Meeting participants included U.S. team members from Argonne National Laboratory and SCIENTECH, Inc., the technical assistance contractor for the safety assessment. Separate meetings were held between the U.S. team and the three parties of the Ukrainian team—Rivne NPP, the International Chernobyl Center/Safety Analysis Laboratory, and Energorisk. Discussions covered functional relationships as well as scope and schedule for future project tasks. (Walter Pasedag, DOE, 301-903-3628; Charles Dickerman, ANL, 630-252-4622) v

The U.S. team is working with Khmelnytskyy NPP to upgrade physical security measures at the plant. During the last half of June and first week of July, project participants held technical discussions at Khmelnytskyy to review progress to date. Management representatives of the Ukrainian organizations involved in the work—EnergoAtom, Kyiv Energoprojekt, Transexpo Corporation, and Khmelnytskyy NPP—and the U.S. project manager from Pacific Northwest National Laboratory signed a joint protocol documenting the discussions. From their discussions, group members reached the following conclusions and agreements:

- As of June 2000, the project is about one month behind the schedule originally agreed upon. The slippage was caused by a 90-day refueling and maintenance outage currently under way at Khmelnytskyy NPP. To meet the project completion

- deadline, Transexpo Corporation agreed to bring additional labor resources onsite to work 24 hours a day.
- Pacific Northwest National Laboratory has purchased half of the equipment, which is in the process of being delivered. Delivery of equipment purchased outside Ukraine has been delayed slightly. However, the equipment is expected to arrive onsite within two weeks. The installation activity is progressing well. In particular, most of the equipment in the reactor building, special building, and fresh fuel storage facility will be installed in the beginning of August. The adjustment, testing, and commissioning activities will be accomplished in August. The unit alarm station also will be installed then.
 - The operational and training procedures are being developed. EnergoAtom and Khmelnytskyy NPP management will define a list of positions and the staffing plan for training and certification. It is anticipated that the plant personnel will be trained by the end of August to be able start routine operation in September 2000.

Host-country contributions to the project include the following:

- Khmelnytskyy NPP is providing financing for design activities related to the electrical system. The plant has contracted with Kyiv Energoprojekt for this work.
- Khmelnytskyy workers have manufactured about half of the doors, frames, enclosures, and other structural components. Those components are ready for installation.

EnergoAtom, Khmelnytskyy NPP, and Transexpo Corporation agreed to make all efforts necessary to complete the physical security upgrades by August 31, 2000. (Grigory Trosman, DOE, 301-903-3581; Andrei Glukhov, PNNL, 509-375-3961) v

***Reliability database
being implemented at
Khmelnytskyy***

During the last week of July, participants in the Ukraine reliability database project met to review past, current, and future activities related to database development and implementation. The meetings, held in Kyiv and Neteshin, involved representatives of Information Technologies Incorporated (INIT), EnergoAtom, and Khmelnytskyy NPP, along with the U.S. project manager from Pacific Northwest National Laboratory and a technical specialist from Western Services Corporation. Western Services is a host-country subcontractor to Data Systems & Solutions (DS&S), the American firm serving as technical advisor and mentor to the reliability database project.

The review of project status found that the database structure is well developed, and the pilot implementation at Khmelnytskyy NPP is in progress. The pilot implementation has taken longer than anticipated, as specialists are working to fully integrate the reliability database with the plant's existing databases and work



processes. The reliability database, originally viewed as a stand-alone database and application program to collect reliability information, has evolved into a more useful tool to the plant. Full integration will allow plant workers to apply the reliability database to their day-to-day operations such as tracking corrective actions, planning maintenance, tracking inventory, and documenting design reference material. Khmelnytskyi specialists had independently begun several database projects to meet these needs. By absorbing these functions into the reliability database, the project is ensuring the use of the available information and the maximum benefit to the plant.

Closing discussions included revised scheduling and resources planning to complete a full implementation of the reliability database at each of Ukraine's nuclear power plants and at EnergoAtom offices. A formal revised plan is expected before the next meeting of the Ukraine coordinating committee. (Grigory Trosman, DOE, 301-903-3581; Tye Blackburn, PNNL, 509-372-4092) v

***International Chernobyl
Center hosts nuclear
safety center
representatives***

Following two-day meetings hosted by the International Chernobyl Center (ICC) at its Slavutych Laboratory, representatives of the Ukraine, Russia, and Kazakh nuclear safety centers agreed on a list of areas with the highest prospects for further cooperation. These areas include decommissioning, rehabilitation of land and radioecology, emergency planning, and safety analysis. As decided during the meetings, a detailed document will be prepared to define possibilities and forms of cooperation.

This was the first integrating meeting of the three centers since they became members of the International Nuclear Safety Center (INSC) network initially encouraged and supported by the U.S. Department of Energy for approximately five years now. In addition to Ukraine's ICC, the Russian INSC, and the Center of Nuclear Technology Safety of Kazakhstan, the INSC network also includes the U.S. INSC at Argonne National Laboratory and the Lithuanian Energy Institute. The network of national centers is addressing and resolving nuclear safety and nonproliferation issues through joint cooperation and exchange of information.

For Ukraine, operation of the center in Slavutych is especially important, given the coming Chernobyl closure in December. In joint research, it will address various issues specifically related to the monitoring, cleanup, decontamination, and decommissioning of the Chernobyl reactors as well as provide alternative employment for those who would lose their jobs with the plant. It is envisioned that the ICC Slavutych Laboratory will become a repository of modern nuclear safety codes and a center of modern codes training, usage, and validation. Ukraine now has more VVER reactors than any other country. Cooperative activities to promote nuclear safety in Ukraine can also include a program to train specialists on techniques related to



***Agreements reached on
preliminary
decommissioning plan
for Armenia***

documenting and standardizing internationally accepted practices for modeling systems, with particular emphasis on the VVER reactors. Using the ICC Nuclear Data Bank facility, Slavutych can serve as a site for the dissemination of nuclear safety data and information in Ukraine and beyond.

Minutes of the meetings will be placed on the Internet sites of each of the three parties involved. At present, the ICC web site can be accessed at <http://slirt.chornobyl.org>. (Riaz Awan, DOE, 301-903-2687; Mykola Kurilchik, International Chornobyl Center, <mailto:kurilchik@chcenter.kiev.ua>) v

Armenia

In mid-July, three U.S. specialists from Pacific Northwest National Laboratory traveled to Yerevan, Armenia, in support of the preliminary decommissioning plan for Armenia NPP. The objectives of the trip were

- to deliver the decommissioning cost model being developed by Pacific Northwest National Laboratory and obtain agreement on the decontamination and decommissioning (D&D) scenarios and cost-estimating assumptions
- to obtain agreement on the radioactive waste and spent nuclear fuel management options to be evaluated in support of decommissioning
- to coordinate the activities and results of this project with a separate D&D project funded by the Technical Assistance to the Commonwealth of Independent States (TACIS) program
- to review the status/progress of the project deliverables being produced by Atomservice and Armenia NPP.

The U.S. specialists held extensive discussions with representatives of Atomservice, Armenia NPP, Decontamination and Radioactive Waste Management Shop, the Ministry of Energy, Department of Atomic Energy, and the Armenia Nuclear Regulatory Administration (ANRA). For plant D&D, it was agreed that four options would be evaluated: 1) prompt decontamination and dismantlement of contaminated facilities, 2) prompt entombment (in-place disposal) of the reactor building, 3) safe storage for 50 years followed by decontamination and dismantlement of contaminated facilities, and 4) safe storage for 50 years followed by entombment of the reactor building. For spent nuclear fuel management, it was agreed that the major option to be evaluated would be expansion of the existing dry-storage facility to provide dry storage of all spent fuel on site indefinitely. Another option that is to be considered is return of the spent fuel to Russia for interim storage and/or final disposition.



For radioactive waste management, the options to be evaluated are more complicated and are dependent on the specific plant decommissioning option being evaluated. In summary, for high-active waste, two options are to be evaluated: 1) retrieve the waste from its current dry-storage facility and provide interim storage of the waste with the spent fuel in the dry-storage facility and 2) encapsulate the waste in place. For low-level waste, the options are to 1) retrieve the waste from the current dry-storage facility and encapsulate it in the reactor building and 2) convert the existing low-level waste interim storage facility into a disposal site for the waste and leave it in place. For intermediate-level waste, the options are to retrieve the waste from the current storage facility, then 1) treat as necessary and encapsulate in the reactor building and 2) treat as necessary and dispose in the converted low-level waste disposal facility.

Discussions with the Ministry of Energy revealed that two new laws relevant to decommissioning of Armenia NPP are being formulated. The first empowers the Armenia parliament as the only entity that can require the plant to shut down permanently for decommissioning. The Ministry of Energy no longer will be able to do this on its own. The second law will require the accumulation of a decommissioning fund (which currently amounts to about \$2 million) through a surcharge on all electricity sold in the country. This surcharge currently is estimated to be about 1 dram per kilowatt-hour (about 2 mills per kilowatt-hour) but ultimately will be based on the decommissioning cost estimate in the preliminary decommissioning plan.

The TACIS representatives indicated that the European Commission has committed to provide funding of 10 million euros toward the shutdown and decommissioning of Armenia NPP. Most of this funding over the next few years is expected to be devoted to identifying and providing alternative energy sources to replace energy now provided by the plant. TACIS management has determined that the plant likely will not be shut down by 2004 and has agreed to provide an additional year (2005) of safety upgrade support to the plant.

Potential future decommissioning activities were discussed. Items of highest priority were

- the development and implementation of a detailed plan to develop the regulatory framework for decommissioning, radioactive waste management, and spent fuel management
- a detailed assessment of the major parameters driving the decommissioning cost estimate and how those parameters are impacted by conditions in Armenia
- an environmental assessment and feasibility analysis of converting the existing low-level waste storage facility into a disposal facility for radioactive waste and/or using the Armenia NPP site as a radioactive waste disposal site



***IAEA working group
discusses stress corro-
sion cracking in RBMK
reactors***

***Ukraine and Bulgaria to
collaborate on VVER-
related projects***



- an assessment of the need and requirement for further treatment and processing of the intermediate-level and low-level wastes. (Dennis Meyers, DOE, 301-903-1418; Steve Short, PNNL, 509-375-2868) v

Cross-Cutting

The first meeting of the International Atomic Energy Agency (IAEA) Intergranular Stress Corrosion Cracking Working Group 1 was held at Kursk NPP, Kurchatov, Russia, July 17 through 20. Working Group 1 is focused on improvements to the performance of, and qualifications for, inservice inspections in nuclear reactors. Nondestructive testing of cooling-water piping systems is aimed at discovering and repairing cracks before they cause leaks and ruptures that could result in the loss of cooling water to the reactor core.

Working Group 1 is led by a U.S. team member and nondestructive evaluation specialist from Pacific Northwest National Laboratory. Participants from RBMK reactors in Lithuania (Ignalina) and Russia (Leningrad, Smolensk, and Kursk) attended, along with experts from Gosatomnadzor and MinAtom in Moscow, the Nuclear Regulatory Department and the Nondestructive Examination Training and Certification Facility in Ukraine, and Mitsui Babcock Energy Limited in Scotland.

RBMK plant representatives described specific inservice inspection problems that they felt the working group should address. The Pacific Northwest National Laboratory specialist discussed approaches used in the United States. The problems at RBMKs include improving inspection techniques so as to more accurately reflect the depth and length of a crack, resolving issues of limited access to some welds and geometries that produce confusing signals, improving reliability of ultrasonic inspection and qualification of inspectors, and identifying techniques for inspection of repairs by the weld overlay technique. Working Group 1 will hold its next meeting early in 2001. (Grig Trosman, DOE, 301-903-3581; Tom Taylor, PNNL, 509-375-4331) v

During the last week of July, a U.S. specialist from Argonne National Laboratory traveled to Kyiv, Ukraine, and Sofia, Bulgaria, to review two U.S.-supported projects: 1) computer code validation for application to VVER reactors and 2) special transient analysis. The U.S. team member met with analysts at Kyiv National Taras Shevchenko University (KU) in Kyiv on the first project. Specialists from Bulgaria's Institute of Nuclear Research and Nuclear Energy (INRNE), Pennsylvania State University (PSU), and Kozloduy NPP met in Sofia to review the second project.

Topics discussed included

- KU's definition and analysis of a standard problem based on transient data for Rivne NPP to validate RELAP5 for VVER reactors
- INRNE's definition and analysis of a standard problem based on a natural circulation test at Kozloduy Unit 6 for the validation of RELAP5 for VVER reactors
- the exchange of standard problems between KU and INRNE to allow comparison of two independent analyses of each problem
- Attendance at the Obninsk Information Exchange Forum to be held in October 2000 — KU expects to present two or three papers at the forum; INRNE analysts expect to present a paper on their evaluation of the INRNE standard problem.
- the status of KU's ongoing VVER special transient analysis project that includes use of the RELAP5-3D code at the Russian International Nuclear Safety Center (RINSC) — Remote connections are being used for visualization of results, and an on-site visit to RINSC, with associated model runs and file exchanges, is planned in conjunction with the October forum.
- INRNE, PSU, and Kozloduy NPP's definition and analysis of a benchmark for coupled codes — A specific transient (startup of a loop after a pump trip) was tentatively selected. Kozloduy NPP management will verify that sufficient data are available; work is expected to start in late August. This work was also discussed with KU, which expressed an interest in performing the analysis of the benchmark with RELAP5-3D. (Walter Pasedag, DOE, 301-903-3628; Jordi Roglans, ANL, 630-252-3283) v

Planned Activities

- *indicates the event is new or has changed in some way since the previous report was issued.*

August 8-10 – Visiginas, Lithuania

Engineering and Technology. Specialists from Pacific Northwest National Laboratory and Data Systems & Solutions will meet with computer specialists from Ignalina NPP to develop the conformed specification for a safety parameter display system for Ignalina Unit 2. Participants will discuss how to interface the safety parameter display system with the integrated computer system that Data Systems & Solutions is installing in Unit 2. Because the integrated control system is funded by others, the cost of adding a safety parameter display system at Ignalina will be reduced significantly. (Grigory Trosman, DOE, 301-903-3581; Ron Wright, PNNL, 509-372-4076)



- **August 21-25 - Scholkino, Ukraine**

Management and Operational Safety - Representatives from Ukraine's nuclear power plants and EnergoAtom will meet at the Crimea Center for Engineering and Science to review the results of the pilot implementation of improved event analysis and reporting procedures at Zaporizhzhya NPP. Representatives of Ukraine subcontractor Novator-Kiev will demonstrate the event analysis and reporting database developed and installed at Zaporizhzhya and EnergoAtom as part of the pilot effort. The U.S. project manager from Pacific Northwest National Laboratory will attend and meet separately with the representatives of the nuclear power plants and EnergoAtom to discuss potential activities to implement the improved processes and database at the remaining plant sites in Ukraine. (Dennis Meyers, DOE, 301-903-1418; Lief Erickson, PNNL, 509-372-4097)

- **August 28-September 1 (rescheduled from June 28-July 7) - South Ukraine NPP, Ukraine**

Management and Operational Safety. Personnel from EnergoAtom, the Nuclear Power Plant Operational Support Institute, and the quality and environmental laboratory departments of South Ukraine NPP will conduct an audit of environmental radiation monitoring at South Ukraine NPP. Audit results will be presented to plant management. The objectives of the audit are to provide auditing experience to South Ukraine NPP quality personnel and to encourage plant management and worker appreciation of the benefits of audits. (Dennis Meyers, DOE, 301-903-1418; Lief Erickson, PNNL, 509-372-4097)

- **September 4-15 - Armenia NPP, Armenia**

Training. Training and technical specialists from Armenia NPP and a U.S. training specialist will begin work to transfer the Chemistry Department Shift Supervisor pilot training program to the plant. (John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079)

- **September 6-7 - Prague, Czech Republic**

Plant safety assessments. Data Systems and Solutions (DS&S) will host an international peer review coordinated by Brookhaven National Laboratory on the Methodology of Comparison (MOC) developed by DS&S in cooperation with Khmelnytsky NPP in Ukraine. Other participants include analysts from Ukraine (Engineering Technologies and Development), Finland (Fortum Engineering), Germany (Gesellschaft für Anlagen und Reaktorsicherheit mbH), and the United Kingdom (SCIENTECH). The reviewers will assess the MOC, which is part of a proposed integrated methodology for implementing the "lead plant" concept to produce a full-scope in-depth safety assessment, specific to Khmelnytsky, making use of safety assessment elements from a similar lead plant. (Walter Pasedag, DOE, 301-903-3628; Charles Dickerman, ANL, 630-252-4622)



• **September 11-15 – Moscow, Russia**

Simulators/Training. VNIIAES will host a workshop focused on the development of normative documents for simulators in Russia. Topics for discussion include document development, format, and content, as well as issues related to normative documents for full-scope and multifunctional simulators. Representatives of Russian organizations involved in simulator activities and a U.S. specialist from Pacific Northwest National Laboratory will participate in the workshop. (John Yoder, DOE, 301-903-5650; Al Ankrum, PNNL, 509-372-4095)

September 11-15 – Argonne, Illinois, USA

Plant Safety Assessment. U.S. team members from Argonne National Laboratory will host a review meeting for the Khmelnytsky in-depth safety assessment project. Participants will include project managers from Khmelnytsky NPP and Kyiv Energoproekt, the plant's technical support organization. They will discuss progress and future activities. (Walter Pasedag, DOE, 301-903-3628; Charles Dickerman, ANL, 630-252-4622)

• **September 11-22 – Kozloduy NPP, Bulgaria**

Training. Specialists from VNIIAES and Sonalysts, Inc., will work with training and technical specialists from Kozloduy NPP to complete plans and instructional materials for a training program for emergency operating instruction trainers at the plant. During the second week, the specialists will implement the course for trainers at Kozloduy Units 1 through 4 (all VVER-440/230 reactors). (John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079)

• **September 11-22 – Kyiv, Ukraine**

Training. Work will begin on a project to transfer a pilot training program for control room turbine operators to Rivne, South Ukraine, and Zaporizhzhya NPPs. Specialists from Khmelnytsky NPP, the Engineering and Technical Center for the Training of Nuclear Industry Personnel, and Sonalysts, Inc., will provide technical assistance to the effort. (John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079)

• **September 26-28 – Zaporizhzhya NPP, Ukraine**

Plant Safety Assessment. The Design Basis Document Steering Committee will hold its first meeting to finalize the plan for development of design basis documents for VVER reactors in Ukraine. The steering committee includes representatives from Zaporizhzhya, South Ukraine, Rivne, and Khmelnytsky NPPs; EnergoAtom; and Ukraine design support institutes. The U.S. project manager from Pacific Northwest National Laboratory also will participate to provide U.S. perspective on the plan and to draft a memorandum of understanding regarding this new project and its relationship with the in-depth safety assessment work being done at each site. (Walter Pasedag, DOE, 301-903-3628; Lief Erickson, PNNL, 509-372-4097)



September 27-29 – Slavutych, Ukraine

Chornobyl Initiatives. The International Chornobyl Center will convene its fourth annual conference to facilitate the exchange of information on international scientific and technical activities at Chornobyl. The conference program will include plenary and workshop sessions and technical tours of Chornobyl NPP and the Unit 4 Shelter. (Riaz Awan, DOE, 38-050-257-7221; Don Draper, PNNL, 509-372-4079)

• **October 2-6 — Khmelnytsky NPP, Ukraine**

Management and Operational Safety. Ukrainian and U.S. specialists will meet at Khmelnytsky NPP to develop a detailed audit plan to assess the development and implementation of the plant's quality assurance program. This gap assessment is intended to identify areas needing improvement to meet the requirements of the national quality assurance standard (which was developed with U.S. support). The U.S. specialists will advise on techniques for conducting such a broad-ranging assessment. The Khmelnytsky audit, tentatively scheduled for late October, will serve as a model for audits to be conducted at the other sites. (Dennis Meyers, DOE, 301-903-1418; Lief Erickson, PNNL, 509-372-4097)



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