

# **INSP Quarterly Activity Report**

## **April through June 2002**

### **Highlights**

#### **Senior PNNL Delegation Travels to Russia for 10-Year Program Review**

##### **Trip Preparation**

A project manager from the Pacific Northwest National Laboratory (PNNL) traveled to St. Petersburg, Russia to visit Leningrad Nuclear Power Plant (NPP) and plan for the upcoming visit by PNNL Director Dr. Lura Powell and other senior laboratory officials. The project manager also met with a representative of Leningrad NPP's International Business Department to outline plans for the PNNL delegation's visit to Leningrad NPP. The June 2002 site visit will include a plant tour and simulator demonstrations.

The PNNL project manager met with representatives of the Western Services Corporation in Moscow, Russia to discuss in-country logistic support and to outline specific needs for the delegation's future trip to Russia.

##### **Delegation Trip**

In June 2002 the PNNL delegation, which included Director Dr. Lura Powell, traveled to Moscow and St. Petersburg, Russia to participate in meetings with Russian government and nuclear industry officials involved in safety improvement work at Russia's NPPs.

Specific meetings included a visit with First Deputy Minister of the Ministry of Atomic Energy of the Russian Federation (Minatom) and the head of Minatom's International Department for North America. Discussions focused on 10 years of cooperation between the United States and Russia on programs to increase safety at Russia's NPPs under the National Nuclear Security Administration's (NNSA) International Nuclear Safety Program (INSP). Outstanding issues discussed were associated with the impending closure of Russia's production reactors, Russian submarine nuclear waste challenges, and the international war on terrorism.

The delegation then visited Minatom's Situational Crisis Center (SCC) and received a briefing on Center operations and a facility tour from the Deputy Director. The INSP helped Minatom establish the SCC in 1999.

A meeting was held with Rosenergoatom officials and members of the Russian Coordinating Committee who acknowledged work with INSP of the past 10 years as "the most fruitful among all international cooperation." Potential ideas for future cooperation, including fuels analysis, reactor decommissioning, and physical protection of Russian NPPs were discussed. Also discussed were Russia's plans for extending the lifetime of first-generation power plants and Rosenergoatom's efforts to establish a central body for nuclear industry funding.

The PNNL group visited the U.S. Ambassador at the U.S. Embassy in Moscow, followed by a meeting with the Director of the Nuclear Safety Institute of the Russian Academy of Sciences

Nuclear Safety Institute (IBREA) to discuss the possibilities of future collaboration in radiation dispersal device activities and expansion of the emergency planning activities at Russian NPPs.

The trip ended with a visit to St. Petersburg for a tour of Leningrad NPP to review INSP project work in progress and completed work, which was evaluated as highly successful. The final meeting was at the Khlopin Radium Institute for an information exchange and discussions about new projects of mutual interest and involvement. (*Susan Senner, PNNL, 509-372-6015; Michael Kluse, PNNL – NSD, 509-372-6199*)

## **Cross-Cutting**

### **International Workshop on Safety of First-Generation VVER-440 Nuclear Power Plants**

In late May, two technical specialists from Argonne National Laboratory (ANL) participated in the International Workshop on Safety of First-Generation VVER-440 Nuclear Power Plants (NPP) in Piestany, Slovakia. A third ANL technical representative helped prepare for the conference and served as the scientific secretary during the meetings. The workshop was sponsored by the NNSA in cooperation with the IAEA, the Nuclear Regulatory Authority of Slovakia (UJD), and the Center for Nuclear Safety in Central and Eastern Europe (CENS). A total of 15 papers were presented as part of the workshop, which was attended by approximately 40 people, coming from six different countries as well as the IAEA. The primary objective of the workshop was to identify and prioritize potential improvements in hardware and plant operation of the first-generation VVER-440 nuclear power plants based on insights gained from recent probabilistic risk assessments (PRAs) completed by the plants and their technical support organizations. A list of the current improvements and the recommendations of the PRAs for potential improvements was prepared and conclusions from the comparisons and analysis of this data will be the substance of the final report of the meeting. (*Jan van Erp, ANL, 630-325-7938*)

### **Bubbler Condenser Steering Group (BCSG) Meets**

A technical specialist from ANL acting as the NNSA-designated U.S representative member of the Organization of Economic Cooperation and Development (OECD) Nuclear Energy Agency (NEA) Bubbler Condenser Steering Group (BCSG), participated in the third meeting of the BCSG. The meeting was held at the Nuclear Regulatory Authority of Slovakia (VJD) in Bratislava, Slovakia on April 29 and 30, 2002. The goal of the Steering Group (SG) is to provide convincing evidence for use in bringing closure to bubbler condenser issues for the VVER-440 model V213s. Three new experiments being funded by a consortium of Czech, Hungarian, and Slovakian utilities, will be conducted using the large-scale bubbler condenser experiment facility at the Electrogorsk Research and Engineering Center (EREC) in Electrogorsk, Russia. The resulting data will serve as evidence of VVER-440/213's bubble-condenser issues.

The new experiments simulate main steam line break, 200-millimeter - medium break Loss of Coolant Accident (LOCA), and 90-millimeter - small break LOCA scenarios. The utilities have now signed a contract with EREC, which states that the three tests should be completed by July 19, 2002. A draft outline for a report on BSCG activities and conclusions was approved at the meeting. The next BCSG meeting was tentatively scheduled for November 25 and 26, 2002 in Prague. A final meeting is planned for December 2002. (*James Sienicki, ANL, 630-252-4848*)

## **Emergency Operating Procedures Workshop Takes Place in Vienna, Austria**

Two technical specialists from PNNL traveled to Vienna, Austria to participate in an IAEA workshop on Emergency Operating Procedures (EOPs). The focus of the workshop was to develop a general guidance document on the development, implementation, and review of EOPs. This document will provide guidance to countries and individual NPPs involved in developing or upgrading their EOPs and will contain guidelines for IAEA review teams and other regulatory organizations when reviewing EOPs. The meeting was well attended with representatives from Bulgaria, Canada, China, Croatia, France, Germany, India, the Netherlands, Pakistan, Russia, Slovakia, United States, and the World Association of Nuclear Operators (WANO).

The first two days of the meeting were dedicated to presentations given by various countries regarding the type of EOPs used in their country and how they have been developed. The next three days were focused on revising and updating an early draft IAEA document on the development and review of EOPs. By the end of the week a significantly updated draft was prepared and further action items were assigned to finish specific sections over the following few weeks. The IAEA staff plans to issue this document later this year. (*Larry Sherfey, PNNL, 509-372-4080; Robert Moffitt, PNNL, 509-372-4108*)

## **Design Basis Documents Developed at IAEA Workshop**

A technical specialist from PNNL attended an IAEA workshop in Madrid, Spain concerning the development of design basis documents for VVER-1000 reactors. The workshop was broken down into two parts. Two days were presentations by Empresarios Agrupados (EA), a Spanish nuclear architect/engineer, and two days were used for an IAEA RER/9/069 expert meeting. The Spanish presentations were very informative about lessons-learned from their methodology, procedures, and computer tools used to re-constitute and maintain the nuclear power plant (NPP) safety design basis for Almaraz NPP. These lessons learned have direct applicability to the NNSA-sponsored Design Document System Management (DDSM) activities in Ukraine. The RER/9/069 expert meeting was comprised of presentations from Kozloduy NPP, Temelin NPP, the Russian NPPs, and the Ukrainian NPPs concerning the design basis re-construction efforts for their VVER-1000s. (*Tyrone Blackburn, PNNL, 509-372-4092*)

## **Ukraine**

### **Meetings Held on In-depth Safety Assessment (ISA) Projects for VVER plants in Ukraine**

An ANL technical specialist attended meetings in Kyiv, Ukraine on the in-depth safety assessment (ISA) projects being sponsored at their VVER plants. In particular, a meeting was held to discuss the status and schedule for the ISA projects. The meeting resulted in an updated working schedule for the ISA projects. The working schedule presents the current plans for carrying out the ISA studies by the nuclear power plant project teams and their consultants, and includes the schedule for the project peer reviews. Energoatom (the Ukrainian utility) emphasized that the NNSA safety assessment program has been of great benefit to Ukraine. As a result of this program some subtle safety risks were revealed and some proposed plant upgrades were found to have limited impact on safety. The completion of the remaining ISA tasks will be important to more accurately identify safety needs to prioritize safety improvements. (*Mark Petri, ANL, 630-252-3719*)

## **Sixth International Information Forum on Safety Analysis for Nuclear Power Plants of the VVER and RBMK Types (Forum-6) Takes Place in Vienna**

Two ANL technical representatives traveled to Vienna, Austria and then to Kiev, Ukraine to help with final preparations and assist in conducting the Sixth International Information Forum on Safety Analysis for Nuclear Power Plants of the VVER and RBMK Types (Forum-6). The meeting was attended by several ANL specialists, a representative from the Idaho National Engineering and Environmental Laboratory (INEEL), and approximately 150 other attendees. The purpose of the meeting was to bring plant, utility, regulatory, and research institute personnel together in an open forum to exchange information concerning past, present, and planned safety assessment work at Soviet-designed reactors.

The INEEL representative chaired sessions devoted to the International RELAP5 Users Group (IRUG) attended by about 40 people and included 17 presented papers. Good discussions were held and the attendees felt that including these sessions as part of the forum was very valuable and should be continued.

An ANL representative chaired the closing session of the forum during which participants made recommendations for future forums. Recommended future forum topics included the regulatory review of safety assessments; internal and external hazard analyses, uncertainty analyses, probabilistic risk assessment applications (including the implementation of risk monitors; safety of staff, the public, and the environment; emergency operating instructions; and severe accident management. (*Charles Dickerman, ANL, 630-252-4622; Mark Petri, ANL, 630-252-3719*)

## **U.S./Ukraine Coordinating Committee Meeting**

The U.S./Ukraine Coordinating Committee Meeting was held on April 9, 2002. An ANL technical specialist attended this meeting, held in Kyiv, Ukraine. Energoatom is working toward having the lead-plants licensed by the end of June 2002. Energoatom plans to append an updated in-depth safety assessment schedule as a supplement to the license submittal to the nuclear regulator to indicate when the remaining safety assessment tasks will be completed. To this end, the committee agreed that a meeting of the In-depth Safety Assessment Schedule Committee should be held in the near future. (*Mark Petri, ANL, 630-252-3719*)

## **Scheduling Finalized for ISA Work at Khmelnytsky and Rivne NPPs**

To assist in maximizing use of the Ukrainian technical resources available for In-depth Safety Assessment (ISA) projects, an ANL technical specialist traveled to Kyiv, Ukraine and met with representatives from Khmelnytsky and Rivne NPPs. The ANL representative first met with the technical management from Khmelnytsky NPP, staff from the Ukrainian technical organizations working on that ISA, and staff from the Data Systems and Solutions - technical assistance contractor for the project. These meetings were held to reach agreement on details of Khmelnytsky ISA work scheduling through summer 2002.

The second meeting was with technical management from Rivne NPP, staff from Ukrainian technical organizations working on the Rivne ISA project, and its technical assistance contractor, SCIENTECH. Agreement was reached on the Rivne ISA work schedule for summer 2002. (*Charles Dickerman, ANL, 630-252-4622*)

## **Further Development of Ukrainian Partner Web Site**

On April 8, 2002 a technical specialist from ANL met with representatives of Kyiv State University (KSU) in Kyiv, Ukraine and the International Nuclear Safety Centers (INSC) regarding the status and further development of the Ukrainian partner web site and infrastructure. This Web site will complement the existing network of INSC sites previously established at ANL, the Russian INSC in Moscow, the Lithuanian Energy Institute in Kaunas, and the National Technology and Science Center in Almaty, Kazakhstan. Discussions with personnel from the department for Nuclear Technology and Cybernetics were held with regards to future development and standardization needs. With the help of the cybernetics department of KSU, the conditions for videoconferencing were tested and plans for adjustments were made. (*Herbert Ley, ANL, 630-252-8224*)

## **Zaporizhzhya Unit 1 Full Scope Simulator Project Status Reviewed**

A technical specialist from PNNL participated in meetings with VNIIAES-Lakrom in Moscow, Russia to discuss the status of Zaporizhzhya NPP's Unit 1 full scope simulator project. Topics of discussion included; the overall project schedule, the Pre-Acceptance Test Procedure (ATP) phase, and other issues relating to project completion. According to the current project schedule the final ready-for-training date is November 20, 2002. The Pre-ATP phase was initiated on March 13, 2002 and is scheduled for completion on August 27, 2002. The next project review meeting is scheduled for August 7-9 where discussions will take place regarding the final ATP phase schedule, to begin August 28, 2002. (*Andrei Glukhov, PNNL, 509-375-3961*)

## **Project Meetings Held at the Center for Reactor Core Design**

At the beginning of April, two representatives traveled to Ukraine for meetings with staff from the Karkiv Institute of Physics and Technology (KHIPT)/Center for Reactor Core Design (CRCD). There were three primary purposes for the meetings; 1) plan long-term task orders to secure CRCD support of the project into 2005, 2) conduct a limited review of CRCD financial management practices, and 3) execute documentation required by Ukrainian tax authorities. The discussions included approximately 15 CRCD staff, including the Center Director, the Deputy Director, and the Chief Accountant.

During the long-term planning sessions, five specific task orders were discussed and statements of work and proposals were developed. The PNNL representatives interviewed 11 CRCD staff members and found that they were all paid every month and were generally satisfied with the salaries they were receiving, even though the amounts varied depending on their participation in work on task orders. Finally, over 100 documents required by the Ukrainian tax authorities were signed and stamped. (*Kent Carlson, PNNL, 509-375-6635; Richard Latorre, PNNL, 509-372-4418*)

On May 24, 2002 two PNNL technical specialists again traveled to the Kharkiv Institute of Physics and Technology (KHIPT) to visit the Center for Reactor Core Design (CRCD). The primary purpose of the visit was for the PNNL representatives to become familiar with CRCD personnel, to review ongoing technical program activities, and to discuss strategy and contractual considerations of pending long-term task orders. The PNNL representatives were also given a tour of selected portions of the KHIPT.

Specific discussions at the CRCD concentrated on the following areas:

- History of the KhIPT and the Nuclear Fuel Cycle complex
  - CRCD department summary of activities performed during the last year
  - Explanation of completed office renovation work and inspection of new equipment
  - Overview and approaches for each of the pending Task Orders
  - Interfaces of staff with other departments at CRCD, and with specialists in the United States
  - Initial comments on proposed revisions to the Work Implementation Schedule
  - Overview of the relationship between KhIPT, the Ministry of Fuel and Energy and NAEC Energoatom
  - Interface and logistics with translation of project documents
  - Long-term participation in the United States by CRCD specialists
  - Process and progress of the efforts to obtain a regulatory license for the CRCD
  - Rationale of manpower projections and staff loading for the CRCD staff
- (Richard Robinson, PNNL, 509-372-4097; Richard Latorre, PNNL, 509-372-4418)*

## **Ukrainian Nuclear Fuels Qualification Project (UNFQP) Progresses**

### **UNFQP Meeting at South Ukraine NPP**

A PNNL technical specialist attended a working meeting of the Ukraine Nuclear Fuel Qualification Project (UNFQP) held at the South Ukraine Nuclear Power Plant (SUNPP). Participants of the meeting included representatives from SUNPP, Westinghouse, NAEK, Energoatom, State Scientific and Technical Center, Center for Reactor Core Design (CRCD), and Westron. The meeting was dedicated to discussing core-monitoring systems, which fulfilled a commitment established during the UNFQP Fifth Working Meeting.

Various technical and licensing requirements were discussed and issues were resolved. A decision was also made on the best option for SUNPP to use in properly monitoring the Project's nuclear fuel assemblies. The meeting met its objective and the parties were successful in determining and agreeing on a design architecture version for the core monitoring system upgrade.

### **UNFQP Regulatory Workshop**

During the week of May 20, 2002, two PNNL technical specialists participated in a Regulatory Workshop on the Ukraine Nuclear Fuels Qualification Project (UNFQP). Prior to the workshop, meetings were scheduled the first two days of the week with, 1) NAEC Energoatom (NAEC) to discuss the Westinghouse Proprietary Agreement, and with 2) the State Nuclear Regulatory Committee of Ukraine (SNRCU) to discuss overall regulatory requirements for the UNFQP.

The discussions and negotiations with NAEC on the Westinghouse Proprietary Agreement were consummated in a signed unilateral agreement between the two organizations for the protection of proprietary information that will be transferred during the implementation of the UNFQP.

In the second meeting, one of the PNNL specialists met separately with the Head of SNRCU and a colleague to participate in discussion of the envisioned regulatory process for the UNFQP. The Head of SNRCU started the discussion with a commitment to have the State Scientific and Technical Center (SSTC) work closely and openly with Westinghouse to facilitate an effective and timely SNRCU regulatory approval/concurrence process during the implementation of the UNFQP.

He also requested that NAEC immediately submit the Concept Technical Decision on the entire project to facilitate the beginning of the regulatory process with SNRCU.

The Regulatory Workshop on UNFQP was held during May 22 – 24, 2002. Presentations and discussions were held between SNRCU, Ministry of Fuel and Energy (MF&E), NAEC, Center for Reactor Core Design (CRCD), South Ukraine NPP, SSTC, DOE, PNNL, and Westinghouse. A focus of the meetings was the need for NAEC to immediately submit the Concept Technical Decision on the project to SNRCU. SNRCU agreed that the submittal of this key licensing document should not await the approval of the revised Work Implementation Schedule. (*Richard Robinson, PNNL, 509-372-4097; Richard Latorre, PNNL, 509-372-4418*)

## **Project Construction Management Group – Status of Heat Plant Commissioning Discussed**

A technical specialist from PNNL traveled to Kyiv and Slavutych, Ukraine in late April and again in late June, 2002. The specialist met with the manager of the Project Construction Management Group (PCMG) in Ukraine to discuss the status of Chornobyl Nuclear Power Plant (ChNPP) replacement heat plant commissioning and final spare parts orders.

All hot water and steam boilers have been commissioned on natural gas but are just now being cleared for Mazute. A mazute test on one boiler was conducted in May and revealed a problem with the burner atomizers that must be corrected before commissioning on Mazute can be completed. The First Deputy General Director of ChNPP indicated that the individual boiler tests on Mazute would be accomplished after the burner atomizers are modified and the comprehensive tests would occur in fall 2002 when there is a sufficient heat load.

All remaining spare parts should be received by the end of June 2002. Discussions also took place on the feasibility study performed by Energoprojekt on the use of excess steam and natural gas capacity for producing electrical power for ChNPP infrastructure usage using steam and/or gas turbines.

The PNNL technical specialist toured the heat plant site to observe progress since December 2001 and met with the Startup and Adjustment General Contractor Management and reviewed status and completion of their subcontract. Both subcontracts involving the U.S. contributions and the General Contractor are complete and being closed out. (*James Hartley, PNNL, 509-372-4428*)

## **Design Document System Management and Other Ukraine Projects Discussed**

In mid-May 2002 a representative from PNNL attended a Ukraine reliability database (URDB) seminar in Yalta, Ukraine. Representatives from the primary host-country vendor, Information and Technologies Ltd. (INIT); utility, Energoatom; each of the nuclear power plants (NPPs) in Ukraine; and various other interested parties attended and provided presentations. The PNNL specialist chaired the second day's session and presented information on a reliability database use in the United States. The Ukrainian NPPs are now fully engaged in directing the future use of the URDB. A few issues remain, however, these as well as other feature and capability concerns are expected to be resolved using the Energoatom-led URDB working group.

Following the seminar, the representative from PNNL traveled to Kyiv and met with utility and vendor representatives on the design document system management (DDSM); the event analysis, reporting, and lessons learned (EARLL); Ukraine Quality Assurance (QA); and Ukraine

Infrastructure projects. Specific issues were reviewed and statements of work for near-term activities were developed for all four projects. *(Tyrone Blackburn, PNNL, 509-372-4092)*

## **Ukraine Code Support Project Representatives Meet**

Two meetings essential to the Ukraine Code Support Project took place in May in Kyiv, Ukraine. An ANL technical specialist conducted the meetings while a second ANL representative participated.

The first of two meetings was a Ukraine code support planning meeting between ANL, The International Chornobyl Center (ICC) Safety Analysis Laboratory (SAL), the Laboratory for Engineering Research and Technology (LERT), and the Institute for Electric Power research in Budapest, Hungary (VEIKI). These organizations will provide responses to requests from Ukrainian NPPs for support with usage of the MELCOR and CONTAIN computer codes. Decisions were made on how to formally handle requests for support and responses. All requests and responses will be entered into a MELCOR/CONTAIN Code Support web page for future reference.

The second meeting was a Ukraine Code Support Project Meeting involving ANL, SAL, LERT, VEIKI, South Ukraine NPP, Khmelnytsky NPP, Zaporizhzhya NPP, Rivne NPP, and Kyiv Energoprojekt (KIEP). An ANL representative led a discussion during which each NPP described the status of their design basis accident (DBA) analyses, beyond design basis accident (BDBA) analyses, and In-depth Safety Assessments (ISAs), as well as plans involving usage of MELCOR and CONTAIN codes.

All NPPs requested a workshop on usage and application of MELCOR plus advice on South Ukraine NPP staff who will work on extending their MELCOR 1.8.3. input deck to BDBAs at the workshop. The workshop is tentatively scheduled to be held in Kyiv at the Kyiv National Taras Shevchenko University (KSU), September 2 – 6, 2002. *(James Sienicki, ANL, 630-252-4848; Igor Bodnar, ANL, 630-252-8336)*

## **Safety Parameter Display System (SPDS) Training Program in Ukraine**

A PNNL technical specialist participated in a workshop with representatives from the Rivne, Zaporizhzhya, Khmelnytsky, and South Ukraine nuclear power plants (NPPs), as well as the Crimea Technical and Research Center (CTRC). Participants, along with representatives from Path Training Corporation and Westinghouse Electric Corporation, began the process of developing a training program for the Safety Parameter Display Systems (SPDS) that are installed in Ukraine NPP control rooms and simulators.

The workshop had three main objectives; 1) to define topics and contents for a training course on the SPDS; 2) to assign the responsibility for the various training course topic and content areas to the NPPs; and 3) to develop a general plan of action, as well as a schedule for completing work.

By the close of the workshop each of the meeting objectives was achieved, future action items were assigned, and a table identifying references and resources was developed. Approximately two interim meetings involving the Ukraine participants will be scheduled, and the second and final workshop was tentatively scheduled for November 2002. *(Al Ankrum, PNNL, 509-372-4095; Richard Denning, Battelle, 614-424-7412)*

## **Russia**

### **Plans Made for Emergency Preparedness Exercise at Bilibino NPP**

A PNNL project manager traveled to Moscow, Russia to meet with representatives of the Nuclear Safety Institute of the Russian Academy of Sciences (IBREA) on planning for the August 2002 emergency tabletop exercise at Bilibino NPP. Discussions with Russian technical specialists focused on securing agreement on exercise objectives and organizational responsibilities for the planning and conduct of the exercise. (*Susan Senner, PNNL, 509-372-6015; Vincent McClelland, DOE, 202-586-8045*)

### **Leningrad EOI and ISA Project Meetings Take Place**

#### **EOI Project**

A technical specialist from PNNL attended an Emergency Operating Instructions (EOI) project meeting at Leningrad NPP in Sosnovy Bor, Russia. Other participants included representatives from Leningrad NPP's operations and training departments and PNNL. The primary objective of the meeting was to discuss and disposition the labor cost for the initial PNNL/Leningrad NPP EOI task orders. A scope of labor compatible with initial PNNL estimates was agreed upon. Leningrad NPP will provide a revised cost proposal for the task orders by the middle of May 2002.

In June the PNNL technical specialist again met with representatives of Leningrad NPP on the topic of their EOI project. The meetings were held at the ES-Konsult offices in Stockholm, Sweden. Participants included representatives from the Leningrad NPP's operations, PSA, and training departments, Lithuanian EOI experts, and SERCO ASSURANCE. The meeting's primary objectives were to discuss ISA EOI input and coordinate near term project activities. All agreed that ISA EOI insight, which defines accident management during design and beyond design basis events, remains the single largest contributor to Leningrad's safety improvement program. The primary ISA input sources were identified, a point of contact to coordinate the transfer of information between the ISA and EOI projects was nominated, and near-term activities were identified which support the drafting of an initial set of risk informed EOIs by the end of August. The EOI project remains on schedule supporting a completion date of August 2003. (*Sam McKay, PNNL, 509-372-4059*)

#### **ISA Project**

A PNNL representative participated in a Leningrad NPP Unit 1 ISA project technical committee (TC) meeting. This meeting was held at the Finnish Center for Radiation and Nuclear Safety (STUK) offices in Helsinki, Finland. Participants included representatives from Russia, Finland, Sweden, Great Britain, and the United States. At the request of the ISA project steering committee chairman, the TC is to meet prior to each steering committee meeting to assess project status and develop a steering committee meeting agenda. A proposed steering committee meeting agenda was drafted. The primary topics for steering committee consideration are; 1) disposition of the primary circuit safety case, 2) disposition of the accident localization system (ALS) compartment integrity issue, and 3) the funding basis for remaining project tasks.

A second Leningrad NPP ISA project meeting was held in June in St. Petersburg. The PNNL specialist again traveled to participate in the meeting along with representatives from Leningrad NPP's Operational Safety Assessment Bureau, and the Kurchatov Institute. The meeting's primary

objective was to define the scope of DSA support required for the next phase of ISA development and EOI justification. It was agreed the next phase of deterministic analysis should include detailed analysis to validate selected initiating events which involve reconstructed front line systems and verification of PSA success criteria. *(Sam McKay, PNNL, 509-372-4059)*

### **Continued work on ISA Project and RBMK Primary Circuit Integrity (PCI) Project**

May 21 through 23, 2002 a PNNL specialist participated in the Leningrad NPP Unit 1 ISA technical steering committee meetings. Participants included government and technical representatives from Finland, Great Britain, Sweden, Russia, and the United States. The technical committee's (TC) primary objectives were to assess project production funding, and finalize the steering committee's (SC) meeting agenda. The SC's primary objectives were to review the project's status and disposition on financial and technical issues impacting the completion of the project.

In addition to the ISA meetings, selected steering committee members participated in an IAEA sponsored RBMK primary circuit integrity (PCI) meeting conducted at the Vienna International Center. Key meeting objectives, participants, and conclusions include:

- The Unit 1 ISA project is on schedule
- The Leningrad NPP PCI working group's next meeting will be sponsored by the Swedish International Program and will meet the week of June 10 in Stockholm, Sweden.
- The Russian regulator found the Unit 2 ISA to be the most complete of all Russian ISA's, completed on time, and contained a limited number of errors or shortcomings which impact its conclusions.
- The management of Leningrad NPP announced that Rosenergoatom (REA) would be the operating utility representing the plant.
- It was agreed that future DOE funded tasks are to support ISA thermal-hydraulic and neutronic issues.

*(Sam McKay, PNNL, 509-372-4059)*

### **Status of Several Russian Safety Projects Reviewed**

The Deputy Director of INSP traveled to Moscow, Russia to meet with experts at Rosenergoatom (REA) and Russian nuclear power plants (NPP) to discuss the status of several projects. The projects discussed were: piping integrity, VVER EOIs, Novovoronezh Configuration management, Control Circuit Testing, and the Kalinin and Volgodonsk simulators. In general the projects are proceeding according to plans with minor exceptions. *(Robert Moffitt, PNNL, 509-372-4108)*

### **ADE Reactor Safety Upgrade Project**

On April 26 – 27, 2002 PNNL representatives traveled to Tomsk, Russia to review draft information leading to a Technical and Price Proposal (TPP) for safety upgrades for the ADE Plutonium production reactors at Seversk and Zheleznogorsk. The U.S. team met with the Siberian Chemical Combine (SCC), the Mining and Chemical Combine (MCC), the Experimental Design Bureau of Machine Building (OKBM), and the Kurchatov Institute (KI). The TPP was reasonably well defined and documented. Comments were provided to the performing organizations and action items assigned to facilitate the development of 'contract quality' price information.

The U.S. team returned to Russia on June 12, 2002 to review updates to the TPP information produced by the SCC and MCC. A related purpose was to initiate discussions with Gosatomnadzor (GAN) leading to a regulatory compliance contract with GAN on ADE safety upgrades. The meeting with GAN was held in Moscow on June 14. Discussions centered on the status of contracting efforts with the MCC and SCC and documentation describing the technical work scope was left with GAN. GAN will review the technical work scope in preparation for receiving a draft Request of Proposal from PNNL.

The team then traveled to Tomsk, Russia to resolve remaining technical questions with the SCC, MCC, and OKBM. The PNNL contracting officer reviewed the cost/price information and found it to be quite satisfactory. Near-term contracting candidates are: improvements to the Emergency Core Cooling System, Emergency Electrical Power Supply System, and the Control Rod Reliability by stack stabilization. *(Robert Moffitt, PNNL, 509-372-4108)*

### **Kola NPP In-depth Safety Assessment Project**

A project coordinator for the Kola nuclear power plant (NPP) In-Depth Safety Assessment Project (ISA) from ANL met with staff members of Kola NPP to discuss progress on the Unit 2 probabilistic risk assessment (PRA). This project is being jointly funded by DOE and by the Swedish International Project (SiP). At the time of the meeting, all project tasks were complete except the sensitivity analysis and the final report. The final report, in English, was completed by June 2002 and delivered to GAN. *(Philip Pizzica, ANL, 630-252-4847)*

## **Armenia**

### **Integrated Physical Security Design**

A technical representative from PNNL traveled to Armenia to help establish a contract on integrated design development with special design office “Elbrus” on March 7, 2002. At the present time, “Elbrus” and its subcontractor, ISTA Systems, have developed design requirements (Task 1). The conceptual design (Task 2) is under development and it is anticipated that this task will be completed in July 2002. In order to avoid project schedule delay, it was agreed to hold a project review meeting at the Armenia NPP in mid-August. Discussions, involving Armenia NPP and the opinions of the Ministry of Energy of Armenia, will focus on the level of confidentiality in place when sharing design documents with PNNL. Another PNNL technical representative visited Armenia NPP in mid-May and received a deliverable, later reviewed for completeness. *(Andrei Glukhov, PNNL, 509-375-3961)*

### **Security Upgrade Implementation of Service Water System**

A contract for implementation of security upgrades of the perimeter of the service water system was established with the Armenian construction company “Gydroenergashin.” The scope of the contract includes upgrades of the newly installed Service Water System and full technical integration into the existing plant perimeter physical security system. All major activities performed by the contractor were verified and accepted. The operation of the new system was demonstrated during the visit. The modernized part of the perimeter (~ 1.5 kilometer) was seamlessly integrated into the existing perimeter security system. *(Andrei Glukhov, PNNL, 509-375-3961)*

### **Armenia NPP Procedure Upgrades**

Technical specialists from PNNL and Excelon Corporation traveled to Armenia to meet with over 30 staff members of Armenia NPP. The purpose of the meeting was for PNNL and Excelon to present an overview of the procedure upgrade project, the procedure format, and procedure implementation in the U.S. Over a period of three days, all 30 Armenia NPP and Atom Service staff members were present for the presentations. Project deliverables were also discussed with Atom Service personnel. (*Larry Sherfey, PNNL, 509-372-4080; Ken Erickson, PNNL, 509-372-4063*)

### **Thermohydraulics Codes Shared with Armenia NPP**

On May 17, two technical specialists from Argonne National Laboratory (ANL) met with the thermohydraulics experts at the Nuclear Power Plant Research Institute, Trnava Inc. (VUJE) who are providing assistance to the Armenia deterministic safety assessment project. With the help of the Slovaks, the Armenians are developing expertise with the thermohydraulics code necessary for the deterministic safety analysis being sponsored by the National Nuclear Security Administration (NNSA). With the support of VUJE, the deterministic safety work should be completed by the end of 2003. The Armenian NPP staff will continue to provide the plant-specific data and the VUJE staff will provide the training and advice on methodology. The Armenian NPP staff will be responsible for certification of the technical validity of the calculations. (*Mark Petri, ANL, 630-252-3719; Philip Pizzica, ANL, 630-252-4847*)