

Activity Report

March 2001

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

***U.S. representatives
participate in
technical/steering
committee meetings
for Leningrad nuclear
power plant safety
assessments***

Highlight

Mr. Walter Pasedag, U.S. National Nuclear Security Administration (NNSA), and Mr. Samuel L. McKay, Pacific Northwest National Laboratory (PNNL), participated in the Leningrad Unit 2 In-Depth Safety Assessment (ISA) Project technical committee and steering committee meetings held March 12-14 at the Swedish International Program offices in Stockholm, Sweden. Participants included project and government representatives from Russia, Finland, Sweden, Great Britain, and the United States.

The project technical committee met March 13 and 14 to discuss project status and prepare the steering committee agenda and progress report. The production dates for all the ISA summary reports and reference materials were reviewed and updated to reflect current production. The format and content of all summary reports were finalized. The sequence of summary report (draft and final) reviews, supporting a project completion date of June 30, was proposed and adopted. The project schedule will be updated weekly to reflect actual production between now and the end of the project. The technical committee agreed to meet at Leningrad nuclear power plant in May and June to assess production and provide closure of all critical production areas.

The project steering committee met March 14 to discuss project status and review the funding available for the Unit 1 ISA project. The steering committee noted that the production schedule between now and completion of the Unit 2 ISA is extremely tight, but it can be met with close coordination among all project participants.

Leningrad plant management expressed a desire to initiate production of the Unit 1 ISA as soon as possible, which will require the earliest possible production (contracting) of reference materials. Leningrad's regulatory commitment requires completion of the Unit 1 ISA by June 2002, so these ISA activities must be initiated as soon as possible. Mr. Pasedag indicated U.S. support of the Unit 1 ISA project provided the Unit 2 ISA is completed on schedule and funds are available.



Kola ISA project on track

Nuclear plant safety enhancement meetings held at REA



Mr. McKay also participated in a meeting with Dr. Yuri Garoussov, Leningrad plant's chief engineer, concerning organizational changes that support the proposed emergency operating instruction (EOI) technical justification project. Dr. Garoussov reported that a new organization is being established at the Leningrad plant to oversee near-term coordination of activities involving EOI development, simulator model development, the reconstruction program, and probabilistic safety assessment modeling development activities. This organization will be managed by a "yet to be appointed" deputy chief engineer and will report to the Office of the Chief Engineer. Dr. Garoussov noted, "Creation of this new organization represents Leningrad nuclear plant's dedication to safety improvement." Dr. Garoussov is organizing a meeting in April with representatives from PNNL and the new deputy chief engineer. *(Walt Pasedag, NNSA, 301-903-3628; Sam McKay, PNNL, 509-372-4059)*

Russia

In early March, U.S. representatives from NNSA and Argonne National Laboratory traveled to Prague to participate in the coordination and steering committee meetings for the ISA project at Kola nuclear plant in Russia. The design basis accident analysis is complete with the exception of approval of the final summary report. Progress on the Unit 2 probabilistic risk assessment (PRA), jointly supported by NNSA and the Swedish International Project, has been good and will reflect the as-built condition of the Kola plant as of December 2002, including the influence of reconstruction activities. The preliminary PRA quantification is expected by June 2001, and the final report is scheduled for completion in November 2001. *(Walt Pasedag, NNSA, 301-903-3628; Phil Pizzica, ANL, 630-252-4847)*

Mr. Robert L. Moffitt from PNNL, Deputy Manager of NNSA's International Nuclear Safety Program, traveled to Moscow in mid-March to meet with managers at Rosenergoatom (REA) and various other project managers to discuss the status of and outstanding issues associated with various projects being conducted to improve safety at operating reactors in Russia. Specific discussions focused on development and implementation of EOIs for VVER reactors, conduct of fire surveys, transfer of circuit breaker technology, and completion of ISAs at Novovoronezh. In general, progress on the majority of the safety improvement projects at Russian plants continues to be good.

While in Moscow, Mr. Moffitt also attended the REA conference on "Nuclear Power Safety Efficiency and Economics." The conference was well attended with representation from the Russian nuclear plants and technical support organizations and from many of the other countries that have operating Soviet-designed

***Simulator normative
document workshop
held at VNIIAES***

***Correction to the
December/January/
February Activity
Report***



reactors, including Ukraine, Lithuania, Armenia, and Bulgaria. The focus of the conference was to review the status and activities that are under way at Russian nuclear plants to

- improve operating efficiency and reliability and increase capacity factors
- improve understanding, management, and mitigation of relevant aging mechanisms
- enhance operational safety.

This two-day conference consisted of several plenary sessions in which speakers addressed the general status of these activities and eight breakout sessions in which specific activities were described in much greater detail. (*Rich Reister, DOE, 301-903-0234; Bob Moffitt, PNNL, 509-372-4108*)

In mid-March, technical specialists from PNNL traveled to Moscow to participate in a one-week workshop on simulator normative documents. Technical and training specialists from the Russian organizations involved in simulator activities—the Russian Institute for Nuclear Power Plant Operations (VNIIAES), Novovoronezh Training Center, and Balakovo, Kursk, and Novovoronezh nuclear power plants—also participated in the workshop. The workshop was held to involve the Russian organizations in discussions about normative documents for simulators and the information that needs to be included in the documents. The workshop agenda included discussions on development and format of a normative document for simulators, topics to be covered, and issues related to normative documents for full-scope and multifunctional simulators. The participants also discussed progress made on normative documents since the last workshop, which was held December 11-15, 2000, and future directions and plans associated with normative document development and implementation.

The PNNL specialists provided a perspective on U.S. simulator normative documents and discussed lessons-learned in the United States related to the development and implementation of such documents. The Russian participants discussed the status and current plans regarding development and issuance of normative documents for their simulators. (*John Yoder, DOE, 301-903-5650; Al Ankrum, PNNL, 509-372-4095*)

The article entitled “Fire Protection Workshop Well Attended” described a workshop on *Methods of Fire Hazards Analysis of Russian Nuclear Power Plants* held at VNIIAES in early December 2000. Incorrect information about the number of fires at Russian nuclear plants between 1995 and 1999 was reported in the first bulleted item in the article. The following information is correct.

***CRTO training under
development for
Rivne, South Ukraine,
and Zaporizhzhya***

***EARLL progress
discussed***

- The head of the State Fire Protection Department presented his organization's perspective on fire protection and suppression at nuclear power plants. There were 26 fires between 1995 and 1999, and there had been 2 fires in 2000 up to the time of the workshop.

(Grigory Trosman, NNSA, 301-903-3581; Andy Minister, PNNL, 509-376-4938)

Ukraine

A two-week working session was held in Kyiv beginning in mid-March to continue the transfer of the Control Room Turbine Operator (CRTO) training program to participating Ukrainian nuclear power plants. Participants included training specialists from the U.S. firm Sonalysts Inc., the Ukrainian Engineering and Technical Center for the Training of Nuclear Industry Personnel (ETC), and trainers from Khmelnytsky, Rivne, South Ukraine, and Zaporizhzhya nuclear plants.

The specialists from Sonalysts, ETC, and Khmelnytsky helped the trainers from Rivne, South Ukraine, and Zaporizhzhya develop an understanding of existing CRTO pilot program materials and identify material for plant-specific modifications using the Systematic Approach to Training methodology. ***(John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079)***

In late March, a technical specialist from PNNL met with representatives of Energoatom and Novator-Kyiv to discuss progress on the 2001 activities for Event Analysis, Reporting, and Lessons Learned (EARLL). Specialists from the Crimea Center, who participated in the discussions by telephone, reported that the root cause analysis pilot investigations for the Zaporizhzhya nuclear power plant had been completed recently.

The PNNL specialist also met with representatives of the Nuclear Power Plant Operational Support Institute (NPP-OSI) and Energoatom to discuss cooperation on a potential future activity to develop a formal operating experience program that would include sharing of lessons learned from events at Ukrainian nuclear plants. He suggested that the first step might be a visit by NPP-OSI, Energoatom, and Crimea Center staff to learn about the event analysis department functions at the Institute of Nuclear Power Operations and World Association of Nuclear Operators (WANO) in Atlanta, Georgia. NPP-OSI has initiated discussions with authorities in Moscow to learn about the event analysis functions of the WANO office in Moscow.

(Walt Pasedag, NNSA, 301-903-3628; Lief Erickson, PNNL, 509-372-4097)

***VVER-1000 design
basis documentation
management
discussed at IAEA
meeting***

A PNNL technical specialist traveled to Prague in late March to participate in the kick-off meeting for a regional project sponsored by the International Atomic Energy Agency (IAEA) to develop methodology for documentation of the design bases for VVER-1000 reactors. The project, originally proposed with the Temelin nuclear power plant as the pilot facility, has evolved into a project to support all V-320 series VVER-1000 reactors. The Nuclear Research Institute-Rez (NRI-Rez) held the meeting at their facilities near Prague. Ukrainian participants from Energoatom, NPP-OSI, and the Khmelnytsky and Rivne nuclear plants also participated. Energoatom's design basis documentation management project leader, the Zaporizhzhya plant chief engineer, and the director of Joint Stock Enterprise Ltd. Energoatom Engineering Service (EIS)-Energodar also represented Ukraine.

The workshop included presentations of organization viewpoints by representatives of REA (Russia), Novovoronezh nuclear plant (Russia), Atomenergoproekt-Moscow, Zaporizhzhya nuclear plant (Ukraine), Kozloduy nuclear plant (Bulgaria), Temelin nuclear plant (Czech Republic), and Energoproect-Praha (Czech Republic). Technical advisors from the Nuclear Protection and Safety Institute (France) and GRS (Germany) provided regulatory viewpoints, and representatives of Sciencetech and Westinghouse-Europe described potential approaches.

All four countries (Ukraine, Bulgaria, Russia, and Czech Republic) agreed that design basis documentation was necessary. The representatives from Ukraine, Bulgaria, and the Czech Republic expressed the importance of design basis information that is controlled by Gidropress (Russia), Kurchatov Institute, and Atomenergoproekt-Moscow. All participants agreed that design basis documentation was a critical part of plant information that must be controlled in a configuration management system.

The proposed IAEA project organization includes NRI-Rez, as the project manager; a senior advisory committee comprising utility and representatives from nuclear plants in all four countries; a technical advisory group of personnel from the United States, Germany, and France; and a representative of Atomenergoproekt-Moscow. The next activity will be to agree on the project scope and definitions. *(Walt Pasedag, NNSA, 301-903-3628; Lief Erickson, PNNL, 509-372-4097)*

**Water chemistry
training implemented
at Armenia**

**Future safety
evaluation projects at
Armenia nuclear plant
discussed**

Armenia

In mid-March, a U.S. training specialist from Sonalysts Inc. participated in the second week of a two-week working session that focused on completion and implementation of the pilot training program in Water Chemistry for Chemistry Department Shift Supervisors at the Armenia nuclear plant. This was the final of three working sessions that were held to develop and implement this training program. At the end of the two-week period, training and program specialists from the U.S. Department of Energy who attended the pilot program implementation provided comments and feedback regarding the pilot program implementation. The comments and feedback provided are being included in the final training material. (*John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079*)

In mid-March, U.S. representatives from NNSA, Argonne National Laboratory (ANL), PNNL, Brookhaven National Laboratory, and Burns & Roe Enterprises Inc. traveled to Armenia and met with representatives from the Armenia nuclear power plant, Armatom, the Armenian Ministry of Energy, Nizhny Novgorod Atomenergoproekt (NNAEP), and Atomservice for a semiannual project coordination meeting to discuss the status and future plans for NNSA work in Armenia. Separate meetings were held with the head of the Armenian Department of Atomic Energy and the Deputy Minister of the Armenian Ministry of Energy. The U.S. representative from ANL also met with the safety assessment and seismic assessment group leaders at the Armenia nuclear plant, and with the deputy director of Armatom.

Contracting arrangements are being made to begin the next stage of the Armenia nuclear plant safety assessment project. An advanced class on the use of thermo-hydraulic system software (RELAP5) for safety assessments will be held at Armatom in April 2001. Armatom and power plant analysts will attend. Computer equipment is being ordered to support the safety assessment work.

The Armenian Nuclear Regulatory Authority (ANRA) issued a draft format and content guide for the Safety Analysis Report (SAR) that the plant needs for licensing. The power plant has requested help from the NNSA program to review those guidelines. A competitive bidding process is now under way to select a U.S. technical support organization to help the plant assess the guidelines and to assist with safety assessment work. During the week of June 4, the NNSA team will meet with representatives of the power plant to discuss the review results and will participate in a meeting between the plant and ANRA to further review the guidelines. The NNSA team will encourage the participation of the U.S. Nuclear Regulatory Commission (NRC) in this process. The Ministry of Energy has signed a memorandum to ANRA asking for a delay in the plant's response to the draft SAR guidelines until July 2001.

**General safety
training material
revised at Ignalina**

**Ignalina SPDS progress
reviewed**

Gidropress (the Russian reactor design institute) has provided a draft set of safe-shutdown procedures for seismic emergencies. A meeting will be held between the plant, Gidropress, and NNAEP on April 16 to review the procedures, which will become the basis for an approved safe-shutdown equipment list. NNAEP has provided the Armenia plant with floor-response spectra needed for the seismic analysis of safety-important systems. The plant has requested NNSA guidance with these calculations. In addition, the plant would like a U.S. specialist to attend a brief seismic screening walk-down during the summer outage, which is currently scheduled for July 1. A final walk-down, which cannot be completed without the safe-shutdown equipment list, would be held in 2002. The NNSA program is procuring a personal computer for the plant's seismic laboratory to support their database activities and analysis work. *(Walt Pasedag, NNSA, 301-903-3628; Mark Petri, ANL, 630-252-3719)*

Lithuania

A training specialist from the U.S. firm Human Performance Analysis Corp. visited Ignalina nuclear plant in mid-March to review materials developed by Ignalina technical and training specialists for use in general employee safety training. After the comments and feedback provided by the U.S. specialist are incorporated into the material, Ignalina trainers will begin using it in their revised General Employee Safety Training Program. *(John Yoder, DOE, 301-903-5650; Don Draper, PNNL, 509-372-4079)*

In mid-March, U.S. technical specialists from PNNL and Data Systems & Solutions met in Visaginas, Lithuania, with specialists from Western Services, Business Information Systems, and Ignalina nuclear power plant to discuss activities related to applications software development and hardware configuration at Ignalina. The objectives of the meetings were to discuss the current status of the safety parameter display system (SPDS) project and collect review comments to the design development document, discuss current issues, and establish a schedule for factory acceptance tests and site acceptance tests.

Except for the Gorbac computer from Russia, all SPDS computer equipment has been delivered to Lithuania. Most of the equipment resides in Western Services offices in Visaginas where the software development is taking place. The delivery of the Gorbac computer is on schedule. The Gorbac computer will be used to input data from the radiation monitoring system to the SPDS. Fiber-optic cables for the system will be purchased in Lithuania.

The Kurchatov Institute is developing a software package for core neutronics calculations and sub-criticality calculations. This task is on schedule and expected to be delivered to Ignalina nuclear plant in April 2001. (*Grigory Trosman, NNSA, 301-903-3581; Ron Wright, PNNL, 509-372-4076*)

Planned Activities

• Indicates the event is new or has changed in some way since the previous report was issued.

• **April 16 - 20, Kyiv, Ukraine**

Training. Nuclear Power Plant Personnel Training Conference. The conference program will include presentations on ongoing U.S./Ukrainian efforts to support improved training programs within Ukraine, the status of training program activities at the various sites, specialty training for technical positions, full-scope simulator training activities, and personnel licensing. (*John Yoder, DOE, 301-903-5650, Al Ankrum, PNNL, 509-372-4095*)

• **April 18 - 20, Kyiv, Ukraine**

Chornobyl Initiatives. International Conference: Fifteen Years after the Chornobyl Accident - Lessons Learned. The objectives of this conference are to develop a common vision of the environmental, medical, socioeconomic, etc., consequences of the Chornobyl accident and to develop understanding of the current situations in the affected countries so further initiatives to mitigate the effects of the accident can be proposed and undertaken. (*Riaz Awan, NNSA, 38-050-257-7221, Don Draper, PNNL, 509-372-4079*)

• **April 23 - 24, Washington, D.C.**

Program Management. Energoatom/NNSA Coordinating Committee Meeting. The program will include discussions of the current status of project activities in Ukraine in the areas of Operational Safety, Simulators and Training, Fire Safety, Safety Equipment, Safety Assessments, Dry Cask Fuel Storage, Physical Security, Nuclear Fuel Qualification, and the Chornobyl Site Replacement Heat Plant. In addition, new projects and special issues will be discussed. (*Rich Reister, NNSA, 301-903-0234, Bob Moffitt, PNNL, 509-372-4108*)

• **May 7 - 16, Kozloduy nuclear power plant, Bulgaria**

Training. A U.S. training expert from Sonalysts Inc. will travel to Kozloduy to participate in a working visit to initiate transfer of the Electrical Maintenance Training Program. This will be the first of three working visits to transfer this program, with the third visit culminating in a pilot presentation of the program. Kozloduy technical and training specialists will work with the U.S. specialist to develop this program. (*John Yoder, DOE, 301-903-5650, Don Draper, PNNL, 509-372-4079*)

• **May 8 - 9, Richland, Washington**

Program Management. Minatom/NNSA Coordinating Committee Meeting. The program will include discussions of the current status of project activities in Russia in the areas of Operational Safety, Simulators and Training, Fire Safety, Safety Equipment, and Safety Assessments. In addition, special issues related to EOI implementation and recent changes at Minatom will be discussed. (*Rich Reister, NNSA, 301-903-0234, Bob Moffitt, PNNL, 509-372-4108*)



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