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"FORUMS FOR INTERNATIONAL TECHNICAL COOPERATION"

By

H. Peter Planchon, Yuri Cherepnin, Irena Tazhabaeva, and Douglas Newton

Engineering Division
Argonne National Laboratory-West
P. O. Box 2528
Idaho Falls, ID 83403-2528

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H. Peter Planchon
Argonne National Laboratory
Idaho Falls, Idaho

Yuri Cherepnin
National Nuclear Center, Rep. of Kazakhstan
Kurchatov, Kazakhstan

Irena Tazhabaeva
Kazakhstan Nuclear Technical Safety Center
Almaty, Kazakhstan

Douglas Newton
US Department of Energy
Washington, D.C.

A key foundation for successful international projects is a solid working relationship between the people and the organizations involved. There has to be good communication, understanding, and trust in technical and in non-technical matters. Further, this communication, understanding, and trust must exist at all levels—between technical specialists, the project leadership and those providing policy direction for the project. The good news for technical projects is an almost universal common appreciation of the "language and culture" of mathematics, physics and technology that extends across national boundaries. The bad or challenging news for international projects is that differences in language and culture make it difficult to build and maintain this foundation of communication, understanding and trust.

This paper describes three types of forums that we have used to build the foundation of communication, understanding, and trust and make US-Kazakhstan projects at the BN-350 reactor successful. These forums are:

1) Workshops with a Product
2) Staff Exchanges
3) Student Exchanges

1. Workshops

Workshops have been used to initiate, review and complete several successful US-Kazakhstan projects. The workshops are intense working meetings with a defined goal

or product. They almost always last more than one week; sometimes they last three weeks. The participants from both sides include:

1) Technical Specialists—establish a common ground of science and technology for the issue at hand and propose appropriate technical criteria
2) Technical Leadership—deal with the project organization, scope and resources
3) Policy/Licensing Officials—provide guidance and early indication of requirements and criteria

1.1 NUCLEAR REACTOR ANALYSIS WORKSHOP

The first US-Kazakhstan BN-350 workshop was held in December 1995. Reactor physicists from EBR-II and BN-350 exchanged information on the computer codes and nuclear data used to manage refueling and material control and accounting for each of the reactors. A program to install new computers and validate new nuclear and safety analysis codes was developed and subsequently carried out. This started the technical communication, understanding and trust that have been the foundation of our subsequent cooperative programs. The workshop also established enduring personal relationships that allowed joint projects in other areas to be started quickly and proceed smoothly.

1.2 SAFETY ANALYSIS WORKSHOP FOR BN-350 SPENT FUEL DRY STORAGE

This workshop was held in February 1998. Kazakhstan participants were from the BN-350, Kazakhstan Nuclear Technology Safety Center (KNTSC) and the Kazakhstan Atomic Energy Committee (KAEC). US participants were from the Department of Energy (DOE), four national laboratories, and a private company. In all, there were some 50 participants.

The format and content for a Safety Analysis Report (SAR) was developed based on Kazakhstan requirements and International Atomic Energy Agency (IAEA) and US Standards. Ten general design criteria for fuel disposition were developed and together with the format and content were agreed to by both sides.

Specialists from both sides conducted the essential analysis for a Preliminary Safety Analysis Report (PSAR). This included:

1) Hazards Analysis
2) Bounding Thermal Analysis of Storage
3) A Boundary Criticality Analysis
4) A Design Review of a Storage Canister

The process and time line for completing and approving a PSAR was developed and agreed to. A staged process for subsequently developing a final SAR and Operational Safety Requirements were also developed and approved. The staged approach allowed for completing all preparations and commencing fuel packaging in less than a year.

A tremendous amount of work and several critical agreements were reached during the four week workshop. This was possible because:

1) There was established communication, understanding and trust among the US and Kazakhstan leadership prior to the workshop.
2) There was approximately two months of preparation organizing and gathering data prior to the workshop.
3) Real technical information was developed. This supported and specified the more general and abstract issues such as format, content and general design criteria. The technical information was developed by joint teams of analysts at computer terminals and design teams working with specific designs on computer design terminals. The specific technical results fed back to the whole group helped define the projects scope and schedule.
4) The workshop was organized to provide daily documentation of progress, decisions, issues and their resolution. This involved specialists, leadership and policy direction.

Signing of Final Protocol Including all Agreements

1.3 SHUTDOWN PLANNING WORKSHOPS

The US and Kazakhstan are now hosting a series of workshops aimed at developing a technical plan and cost estimate for decommissioning of BN-350. The planning started as a bilateral effort but has been expanded to include all who will contribute. At the last workshop there were participants from the European community and Russia in addition to Kazakhstan and the US.

At the first planning workshop, a development guide was generated. The guide specified the scope, format and content of the decommissioning plan. In addition, it identified environmental safety issues and information that is available for each section; data, where there are gaps in data, and a method for getting the information is listed. Finally, the guide identified the people and organization responsible for writing each section of the decommissioning plan.

The second planning workshop had participants from five Kazakhstan organizations, three members of the European Union, three US organizations, three Russian organizations, and the IAEA. The workshop provided a good format for exchanging technical information and obtaining international expertise for planning.

2. Staff Exchanges

We have found that staff exchanges are an effective way to exchange technical know-how and establish a team collaboration in a specific technical area. A review of two cases illustrates how this has worked effectively for Argonne, DOE and Nuclear Regulatory Commission (NRC) in the US and the KNTSC and KAEC in Kazakhstan.

The first case involved exchange of staff with Kazakhstan's Atomic Energy Committee, the regulatory agency in Kazakhstan. As part of the US-NRC aims to assist in the strengthening of Kazakhstan's regulatory infrastructure, two members of Kazakhstan's regulatory staff were stationed at Argonne-West for six weeks. During this time, they participated in developing and reviewing operational safety cases. These cases involved new equipment or processes and a formal assessment of the impact they would have on safety. They participated in safety inspections and walk-throughs of nuclear facilities-including EBR-II which is undergoing decommissioning and the Sodium Process Facility which is processing the sodium coolant from the Fermi Reactor and from EBR-II. This activity was done with Argonne and with DOE personnel who are responsible for safety and oversight at Argonne-West. We believe the exchange illustrated integration of decommissioning design and plans, safety analysis and its approval and operational safety practices and oversight.

The second staff exchange involved two members of the newly formed Kazakhstan Nuclear Technology Safety Center. One person worked with Argonne analysts on safety analysis for fuel disposition. He developed an expertise in nuclear criticality

analysis, and thermal analysis using the practices, codes and standards for applying the analysis. The other person developed a plan for conducting formal safety analysis in the KNTSC and a configuration control plan for the center's safety codes. In addition to adding to the center capability to do safety analysis, the exchange formed a long term basis for joint US-Kazakhstan safety projects.

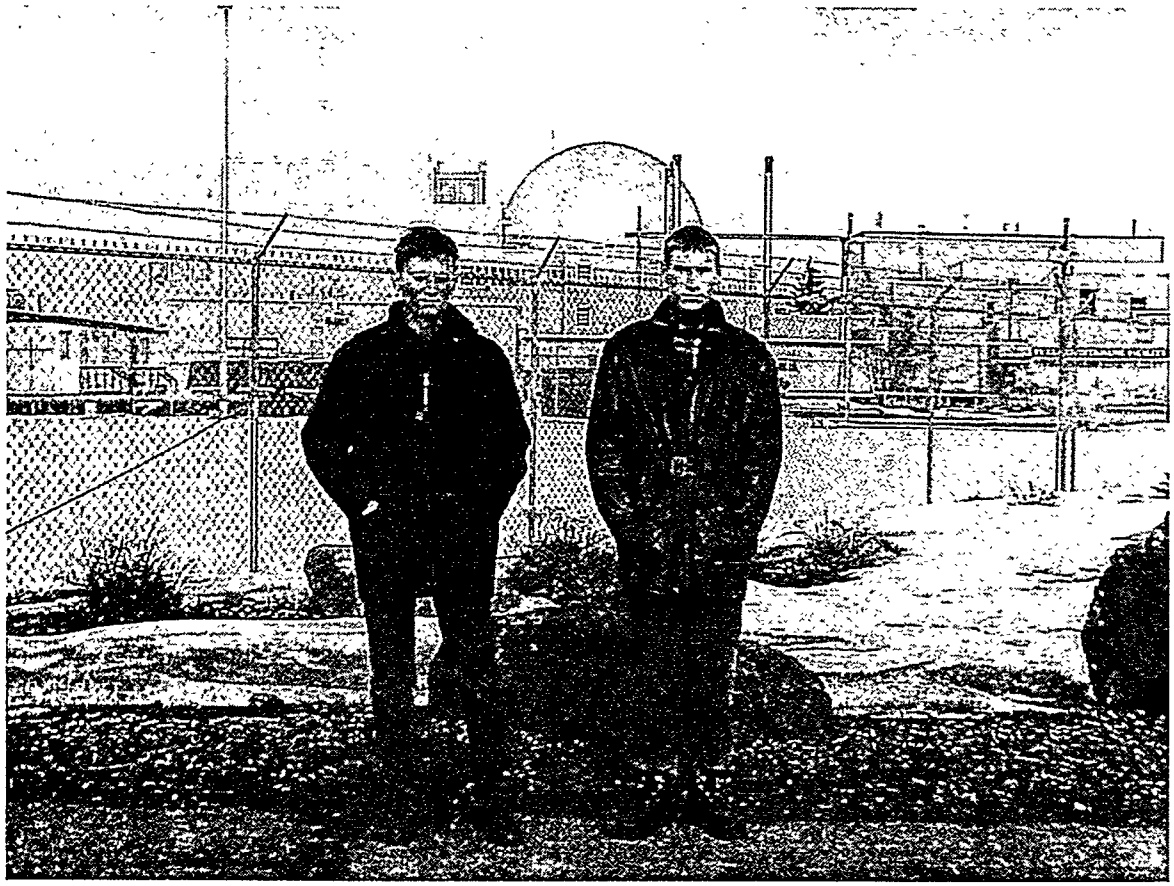
A third staff exchange was used to facilitate startup and operation of fuel packaging operations. US experts from DOE, laboratories and private companies were stationed at the BN-350 to be part of the startup team. The team included those who had designed and analyzed new equipment. This staff exchange greatly accelerated the installation of new equipment by allowing on-the-ground decisions to be made by design organizations. When inevitable startup problems were encountered, there was excellent communication with the network of international experts and suppliers of equipment that greatly expedited a solution to the problem. Daily reports from the team at BN-350 kept all contributors to the project informed and ready to spot problems early and contribute to solutions.

3. Student Exchanges

Decommissioning of nuclear facilities will take years or, for a safe store strategy, decades to accomplish. It is, therefore, recognized that cooperative programs with long lasting effects are needed. Student exchanges with career long benefits fit the order. Two types of student exchange programs that have and will contribute to the decommissioning of BN-350 will be reviewed.

The first student intern program was sponsored by the Office of Arms Control and Non-Proliferation in the US Department of Energy. A US post-graduate intern was stationed in Kazakhstan at the Nuclear Technology Safety Center. The intern has greatly improved communications and coordination in all US-Kazakhstan joint projects. The key to success has been: 1) selecting an intern that has good language and electronic communication skills; 2) selecting an intern that has good cultural knowledge and social skills in the country; and 3) placing the intern in a position where she was accepted and helpful.

The second student exchange program is being started. Our objective is to have exchange students to study and do research in a university or institution of the other country. Last year, the first exchange students came to the US (see photo) and identified research areas for initial exchange. We are concentrating on fundamental scientific importance to decommissioning in which there is student interest and funded institutional expertise.



First Student Exchange Program Participants
Timur Kulsartov and Maxim Makukov
Kazakhstan State National University