2.0 Project Organization

U.S. efforts to reduce risks at Soviet-designed nuclear power plants are organized into six areas, referred to as work elements. Because the efforts in each country vary according to need, the projects listed under each work element are not implemented in every country. U.S. work complements the safety upgrade projects of the host countries, international organizations, and the other G-7 countries—Canada, France, Germany, Italy, Japan, and the United Kingdom.

2.1 Increasing the Safety of Day-to-Day Operations

Management and Operational Safety Projects

Management and operational safety projects increase the ability of plant personnel to operate reactors safely. U.S. personnel work with host-country personnel to

- establish host-country centers for training plant personnel
- develop control room simulators for training reactor operators
- develop and implement symptom-based emergency operating instructions
- transfer up-to-date technology and training for maintenance and non-destructive examination of plant components
- establish configuration management systems
- improve the plants' quality assurance programs
- establish procedures and standards for safe operations
- develop a reliability database for Soviet-designed reactors.

Reactor operators train on full-scope control room simulators, like this one at the Balakovo nuclear power plant.

2.2 Upgrading Safety Systems

Engineering and Technology Projects

Engineering and technology projects reduce risks by upgrading the physical safety systems of nuclear power plants. U.S. personnel work with host-country personnel to

- develop safety parameter display systems to give control room operators key information for preventing accidents and responding to abnormal conditions

Safety parameter display systems, like the one at the Kursk nuclear power plant, provide key information for preventing accidents.

- transfer tools and equipment for effective fire protection
- conduct fire hazards analyses
- provide materials and equipment for improved radiation confinement
- install backup power systems to ensure that plants will have the electricity to shut down and cool the reactor in an emergency
- provide emergency water supply and emergency cooling systems
- improve the reliability of circuit breakers and motor-operated isolation valves
- improve the reliability of electronic control-and-protection systems
- transfer to host countries the ability to manufacture safety equipment that meets international requirements.

Mobile pumping unit for emergency water supplies.

2.3 Conducting In-Depth Safety Assessments

Plant Safety Assessment Projects

Plant safety assessment projects improve the abilities of designers, operators, and regulators to identify risks and set priorities for safety upgrades. The United States is

- training host-country personnel to conduct risk assessments of events that could lead to an accident and to determine safety margins by examining a plant's design and configuration
- providing technical support for plant-specific safety assessments
- transferring computer analysis codes and training host-country personnel to use them.

2.4 Working Safely with Spent Nuclear Fuel

Fuel Cycle Safety Projects

Fuel cycle safety projects improve capabilities for storing spent reactor fuel.

- The United States has transferred equipment and training to establish a dry-cask storage system for spent fuel at Ukraine's Zaporizhzhya plant.
- U.S. engineers are working with Ukrainian engineers to develop an in-country system for managing spent fuel.

Dry-cask storage system under construction at the Zaporizhzhya nuclear power plant.

- The United States has transferred a computer code for use at a Hungarian dry-storage system.

2.5 Developing Institutional and Regulatory Frameworks

Nuclear Safety Institutional and Regulatory Framework Projects

U.S. experts are working with Ukrainian and Russian regulatory experts to develop strong legal frameworks for regulating Soviet-designed nuclear power plants. The objective is to promote

- strong, independent regulatory bodies with the capabilities to regulate nuclear activities
- host-country adherence to international nuclear safety treaties and liability conventions
- protection for U.S. contractors from undue liability in foreign and U.S. courts if a malfunction or accident occurs at a Soviet-designed nuclear facility where the U.S. contractor has provided services.

The U.S. Nuclear Regulatory Commission has the primary U.S. responsibility for this area of work. The U.S. Department of Energy provides support by transferring training and technology to regulatory organizations that oversee cooperative safety projects, transferring guidelines for developing procedures and validating computer analysis codes, and implementing agreements with Ukraine and Russia on regulating fuel cycle facilities.

2.6 Addressing Risks at Chornobyl

Chornobyl Initiatives

The United States is reducing risks at Ukraine's Chornobyl plant through three major efforts.

- U.S. specialists are participating in an international effort to prevent collapse of the shelter around Chornobyl's ruined Unit 4 reactor, suppress the radioactive dust inside the shelter, protect shelter workers from radioactive and industrial hazards, and address other urgent safety concerns.
- U.S. specialists are working with Ukrainian specialists to develop technical strategies for shutting down and deactivating the Chornobyl plant. The United States is working with Ukraine to complete the construction of a new heat plant to provide replacement power as the plant is shut down.

The International Chornobyl Center's Slavutych Laboratory.

- The United States and Ukraine jointly established the International Chornobyl Center for Nuclear Safety, Radioactive Waste and Radioecology in 1996. The center supports safe operations at Chornobyl and other Ukrainian nuclear power plants, addresses human safety and environmental issues created by the 1986 disaster at Chornobyl, and is alleviating socioeconomic problems related to the plant's future decommissioning. The International Chornobyl Center's primary technical branch, the Slavutych Laboratory for International Research and Technology, is collaborating with the United States and other countries on joint technical projects for nuclear safety.