



Upgrading Safety Systems New Equipment Reduces Fire Threat at Soviet-Designed Reactors

A fire at a nuclear power plant can be catastrophic. If a fire injures personnel or damages a plant's safety systems, operators may be unable to shut down the reactor safely. The result could be damage to the reactor core and release of radioactive material.



Fire prevention and fighting equipment is being upgraded at many of the Soviet-designed nuclear power plants with the help of the United States. Equipment ranges from fire doors and water pumps to portable radios and firefighting suits.

U.S. experts are working with Russian and Ukrainian specialists to conduct safe-shutdown analyses, which identify fire risks that could lead to damage of a plant's safety systems at Soviet-designed nuclear power plants. The United States also is providing materials and equipment to improve capabilities to prevent, detect, contain, and suppress fires.

Unlike U.S. nuclear power plants, which rely on sprinkler systems to suppress fire, Soviet-designed plants rely on large brigades of dedicated fire personnel. These brigades need to be able to detect fires reliably and alert staff immediately. They also must have the equipment to fight fires effectively. To meet these needs, the United States is supplying fire- and smoke-detection systems, radio systems, and equipment such as fire extinguishers, hose nozzles, coats, boots, helmets, and breathing gear. This basic equipment is essential for fighting fires.

The United States also is supplying materials to prevent the occurrence and the spread of fires. In

1992, the first Western visitors to Soviet-designed plants found such conditions as unprotected electrical circuits, conducting wire sprayed with flammable material, and fire doors that sealed poorly and were made of wood. To address these risks, the United States has supplied fire-retardant sealants to coat electrical cables and seal the room-to-room penetrations through which the cables pass. U.S. specialists have worked with Atomremmash (a Russian company) and Askenn Concern (a Ukrainian company) to develop expertise in manufacturing effective fire doors. As a result, these companies have produced 525 fire doors in Russia and 375 fire doors in Ukraine that are being installed in various nuclear power plants.

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A Texas company, Promatec, initially received U.S. Department of Energy support to provide fire safety equipment to Soviet-designed plants. The products include cable coating and penetration sealant materials, as well as confinement isolation coating materials to reduce leakage from confined spaces. The DOE projects helped Promatec become recognized within the former Soviet Union. As a result, the company has been able to sell materials directly to the plants in amounts that far exceed the value of the initial support they received from the United States.

U.S.-supported fire safety improvements include the upgrades listed in the chart below:

Country	Plant	Fire Protection Upgrades	Status
Armenia	Armenia	140 fire doors	Complete
		Fire-detection and alarm system	In progress
		Nonflammable epoxy floor coating	In progress
Bulgaria	Kozloduy	Two fire trucks	Complete
Russia	Leningrad	Unit 1 fire-detection and alarm system	In progress
		Unit 2 fire-detection and alarm system	In progress
	Smolensk	400 fire doors	Complete
		Fire-detection and alarm system	In progress
		Cable coating and penetration sealant materials	In progress
		80 sets of firefighting gear	Complete
		80 units of breathing apparatus	Complete
		Two compressors	Complete
		Variable-spray hose nozzles	Complete
		Radio system with in-plant antenna	Complete
		Ukraine	Chornobyl
Fire-detection and alarm system	In progress		
Cable coating and penetration sealant materials	In progress		
Coating materials for structural steel in Unit 3 turbine hall	In progress		
90 sets of firefighting gear	Complete		
30 units of breathing apparatus	Complete		
One compressor	Complete		
Variable-spray hose nozzles	Complete		
Portable radios and base station	Complete		
Zaporizhzhya	125 fire doors		In progress
	Fire-detection and alarm system		In progress
	Cable coating and penetration sealant materials		In progress
	50 sets of firefighting gear		Complete
		Variable-spray hose nozzles	Complete
		Sprinkler system and fire extinguishers	Complete