

1.0 Introduction

The U.S. Department of Energy conducts a comprehensive effort to improve nuclear safety worldwide. U.S. specialists establish working partnerships with nuclear regulatory and power plant personnel in other countries. The United States coordinates its work with similar efforts undertaken by the other G-7 countries—Canada, France, Germany, Italy, Japan, and the United Kingdom.

A major component of this cooperative safety work focuses on Soviet-designed nuclear power plants in Armenia, Ukraine, Russia, Kazakhstan, and five Central and Eastern European countries—Bulgaria, the Czech Republic, Hungary, Lithuania, and Slovakia. In these countries, 21 power plants with a total of 65 operating reactors participate in the joint efforts.

1.1 Objectives of the Cooperative Safety Work

The U.S. goal is to work with host countries to reduce the most serious risks at their nuclear power plants. The United States established at the outset the following objectives:

- ◆ Improve the physical condition of plants and install needed safety equipment.
- ◆ Establish a nuclear safety culture in which safety takes priority over power production.
- ◆ Develop improved safety procedures and train operators in their use.
- ◆ Conduct safety assessments that meet international standards.
- ◆ Establish regional centers for training reactor personnel and develop simulators for training control room operators.
- ◆ Develop institutional and regulatory frameworks for nuclear power plant design, construction, and operation that are in keeping with international practices.
- ◆ Address the extraordinary problems at Chernobyl.

Is It a Plant or a Reactor?

Soviet-designed nuclear power plants can have multiple reactors, which can share common facilities. A listing of the plants and operating reactors discussed in this document is provided below. The document discusses 21 nuclear power plants and 65 operating reactors. Appendix A describes the reactor types.

Armenia

Armenia plant

- ◆ One VVER-440/230 reactor

Bulgaria

Kozloduy plant

- ◆ Four VVER-440/230 reactors
- ◆ Two VVER-1000 reactors

Czech Republic

Dukovany plant

- ◆ Four VVER-440/213 reactors

Hungary

Paks plant

- ◆ Four VVER-440/213 reactors

Kazakhstan

Aktau plant

- ◆ One BN-350 reactor

Lithuania

Ignalina plant

- ◆ Two RBMK-1500 reactors

Russia: Nine plants, 29 reactors

Balakovo plant

- ◆ Four VVER-1000 reactors

Beloyarsk plant

- ◆ One BN-600 reactor

Bilibino plant

- ◆ Four LWGR-12 reactors

Kalinin plant

- ◆ Two VVER-1000 reactors

Kola plant

- ◆ Two VVER-440/230 reactors
- ◆ Two VVER-440/213 reactors

Kursk plant

- ◆ Four RBMK-1000 reactors

Leningrad plant

- ◆ Four RBMK-1000 reactors

Novovoronezh plant

- ◆ Two VVER-440/230 reactors
- ◆ One VVER-1000 reactor

Smolensk plant

- ◆ Three RBMK-1000 reactors

Slovakia**Bohunice plant**

- ◆ Two VVER-440/230 reactors
- ◆ Two VVER-440/213 reactors

Ukraine: Five plants, 14 reactors**Chornobyl plant**

- ◆ One RBMK-1000 reactor

Khmelnysky plant

- ◆ One VVER-1000 reactor

Rivne plant

- ◆ Two VVER-440/213 reactors
- ◆ One VVER-1000 reactor

South Ukraine plant

- ◆ Three VVER-1000 reactors

Zaporizhzhya plant

- ◆ Six VVER-1000 reactors

1.2 The Scope of This Report

This report describes major activities and key accomplishments of the cooperative safety work, beginning with the inception of these efforts in 1992 and continuing through December 1998. The report is organized into the following sections:

- ◆ Section 2 describes the organization of projects into six work areas.
- ◆ Section 3 describes activities in Armenia.
- ◆ Section 4 describes activities in Ukraine, including work to improve operations, maintenance, and fire protection at Chornobyl's operating Unit 3 reactor.
- ◆ Section 5 describes other activities at Chornobyl, including U.S. support for deactivating the plant, preventing the collapse of the shelter around the ruined Unit 4 reactor, and establishing a nuclear safety research center near the Chornobyl site.
- ◆ Section 6 describes activities in Russia.
- ◆ Section 7 describes activities in five Central and Eastern European countries: Bulgaria, the Czech Republic, Hungary, Lithuania, and Slovakia.
- ◆ Section 8 describes activities in Kazakhstan.

The appendixes provide additional details:

- ◆ Appendix A provides diagrams and schematics of Soviet-designed reactor types.
- ◆ Appendix B lists Soviet-designed nuclear power plants in each host country.
- ◆ Appendix C provides schedules for the cooperative work.
- ◆ Appendix D provides tables for selected activities in participating countries.
- ◆ Appendix E lists participating power plants, contractors, government agencies, utilities, and other organizations.
- ◆ Appendix F describes the process for selecting safety projects.
- ◆ Appendix G describes the Internet site, Resource Center, and other information resources regarding U.S. involvement in the joint safety work.
- ◆ Appendix H spells out abbreviations and acronyms used in this report.
- ◆ Appendix I defines key technical terms.