

Appendix I

Definitions of Terms

ABAQUS	Suite of U.S.-developed engineering analysis software packages used throughout the world to simulate the physical response of structures and solid bodies to load, temperature, contact, impact, and other environmental conditions.
ADAM	U.S.-developed computer code for nuclear accident diagnosis, analysis, and management.
analysis of emergency operating instructions	A process of using computer simulations of accident scenarios to ensure that a plant's emergency operating instructions will mitigate the consequences of an accident.
blowdown	A blowdown occurs when a pipe carrying hot, pressurized water breaks, causing the leaking water to flash to steam. When a blowdown involves pipes that carry reactor cooling water, the released steam will contain radionuclides.
COBRA-SFS	U.S.-developed computer program, Coolant Boiling in Rod Arrays-Spent-Fuel Storage, used to analyze single-phase gas-cooled spent-fuel storage casks with radiative, convective, and conductive heat transfer.
configuration management	A process for ensuring that a nuclear power plant's physical configuration and layout meet the safety design basis for the plant and that all design documentation is up to date.
control-and-protection system	An electronic system that monitors key reactor conditions, such as pressure, temperature, coolant flow, and neutron flux. If these conditions become abnormal, the control-and-protection system will shut down the reactor automatically.
deactivation	A process that follows the permanent shutdown of a reactor, leaving it in a safe storage condition for an indefinite period. Deactivation includes removing the nuclear fuel from the reactor core, draining and drying the primary coolant systems, and shutting off power to some of the electrical and control systems.
decommissioning	The process of safely removing a facility from service followed by reducing residual radioactivity to a level that permits the release of the property for unrestricted use.
dry-cask storage system	A means of storing spent nuclear fuel; it is less costly than storage pools. Concrete casks are filled with spent-fuel assemblies, backfilled with inert helium gas, and welded shut. The casks provide both gamma and neutron shielding and have a minimum life of 40 years.

emergency operating instructions	Sets of actions reactor operators must take in an emergency to stabilize the reactor and mitigate consequences of an accident or other abnormal event. <i>Event-based emergency operating instructions</i> require operators to identify the cause of a problem, such as loss of power or a leak in a steam-generator tube, before responding. <i>Symptom-based emergency operating instructions</i> specify responses to changes in plant parameters, such as reactor pressure, water level, or temperature. By responding to parameter changes, operators can stabilize a reactor without first having to determine the cause of the problem. The time saved can prevent disaster.
GASFLOW	U.S.-developed computer program for analyzing risks of hydrogen buildup in nuclear reactor containment systems.
in-depth safety assessments	A set of analyses for determining the most significant risks at a nuclear power plant and setting priorities for safety upgrades.
MELCOR	U.S.-developed computer program for analyzing severe accidents; used for nuclear power plant safety analyses.
MSC/NASTRAN	U.S.-developed computer program for safety analyses.
NEPTUNE	U.S.-developed computer program for analyzing the structural safety of nuclear power plant accident localization system.
NESTLE	U.S.-developed computer program for analyzing neutron kinetics.
nondestructive examination	A process for finding flaws in pipes and steam-generator tubes through the use of ultrasonic, x-ray, and eddy-current equipment.
nuclear plant analyzer	A computer system used to perform safety analyses and calculations. It provides an analytical basis for developing day-to-day operating procedures and emergency operating instructions. The analyzer's thermal-hydraulic and neutronic model of a reactor enables operators to understand and predict the reactor's heat and flow characteristics.
ORIGEN	U.S.-developed safety analysis computer code used to estimate the amount of radioactive materials that would be released from reactor fuel under hypothetical accident conditions.
PACER	U.S.-developed computer program for analysis of reactor confinement systems.
probabilistic and deterministic assessments	Probabilistic assessments are used to identify events that would challenge the plant system, to model the progression of an accident, and to estimate system failure probabilities. Deterministic safety analyses use accident scenarios to assess safety margins incorporated into a plant's design.

RELAP5	A thermal-hydraulics computer code used for safety analysis in the United States. The United States is providing the code and related training to nuclear power plants with Soviet-designed reactors.
REVEAL_W2	U.S.-developed computer program for use in safe-shutdown analyses of nuclear power plants.
root cause analysis	Analysis in which a range of contributors (e.g., management, human decision-making, plant procedures, maintenance) is examined to identify the cause(s) contributing to an error and to determine corrective actions to prevent error recurrence.
R&R WORKSTATION	U.S.-developed computer program for probabilistic risk assessments of nuclear power plants.
SAFETY MONITOR	U.S.-developed computer software used in modeling a nuclear power plant's safety-related systems as part of a probabilistic risk assessment.
safe-shutdown analysis	A process of identifying the most dangerous fire risks at a nuclear power plant, concentrating on areas where fire could damage the safety systems needed to shut down a reactor safely.
safety parameter display system	Gives plant operators the information they need to control a nuclear plant in the event of an accident. The system automatically displays the status of critical safety functions, such as reactor core cooling, the nuclear chain reaction, and the leak-tightness of the radiation confinement system.
SAPHIRE	"Systems Analysis Programs for Hands-on Integrated Reliability Evaluations," a U.S.-developed probabilistic risk and reliability analysis tool.
SCALE	U.S.-developed computer code for analyzing the safety of spent-fuel storage.
simulators	Systems that replicate nuclear reactor control rooms. <i>Full-scope simulators</i> use full-size physical replicas of actual control room panels, complete with equipment such as switches, controllers, indicators, and recorders. <i>Analytical simulators</i> , which cost much less, use computer screens with graphic displays that imitate plant systems; operators enter computer commands to "operate" equipment, rather than using switches and controllers as they would in an actual control room or with a full-scope simulator.
STEPAN	Russian-developed computer program for analyzing neutron kinetics.

STREAM	System for Tracing Remediation, Exposure, Activities, and Materials; management software for decontamination and decommissioning projects at nuclear facilities.
Systematic Approach to Training	Provides a standard framework for identifying training needs, developing course materials, and teaching. The methodology combines classroom instruction with the use of hands-on equipment, including a full-scope simulator.
technology transfer	Technology transfer refers not just to the delivery of hardware but to passing on knowledge, processes, and methodologies. The goal is to establish the indigenous safety infrastructure needed for safe operation and maintenance of nuclear plants.
TEMP-STRESS	U.S.-developed computer program for analyzing the structural safety of a nuclear power plant's accident localization system.
validation and verification	Before using a computer software code for safety analyses of a nuclear power plant, analysts validate the code by checking it against test data. These data are produced by experimental facilities designed to simulate the behavior of a reactor. The analysts verify the code by using it to develop plant models and accident scenarios, then checking the models and scenarios against data from actual reactors.
vibration monitoring and shaft alignment equipment	State-of-the-art systems that enable maintenance staff to detect and correct misalignment and imbalance in rotating machines, such as pumps, which are critical to the safe operation of nuclear power plants.