## ABSTRACT

This report documents the technical review of the AP1000 standard nuclear reactor design by the U.S. Nuclear Regulatory Commission. The application for the AP1000 design was submitted on March 28, 2002, by Westinghouse Electric Company in accordance with Subpart B, "Standard Design Certifications," of Title 10 of the Code of Federal Regulations (10 CFR) Part 52, and Appendix O of 10 CFR Part 52, "Standardization of Design: Staff Review of Standard Designs."

The AP1000 nuclear reactor design is a pressurized water reactor with a power rating of 3415MWt with an electrical output of at least 1000 MWe. The AP1000 design contains many features that are not found in current operating reactors. For example, a variety of engineering and operational improvements provide additional safety margins and address the Commission's severe accident, safety goal, and standardization policy statements. The most significant improvement to the design is the use of safety systems that employ passive means such as gravity, natural circulation, condensation and evaporation, and stored energy for accident mitigation. These passive safety systems perform safety injection, residual heat removal, and containment cooling functions.

Some features of the AP1000 include a longer reactor core design, larger pressurizer, an in-containment refueling water storage tank, automatic depressurization system, revised main control room design with a digital microprocessor-based instrumentation and control system, hermetically-sealed canned reactor coolant pump motors mounted to the steam generator, and increased battery capacity. In addition, the facility is designed for a 60-year life, which exceeds the projected 40-year combined license (COL) period, and employs structural modules in its design.

This report presents the status of the staff's review of information submitted to the NRC through April 21, 2003, the cutoff-date for consideration in this report. The staff has identified open and confirmatory items that must be resolved before the staff can complete its review of the design certification application. These are summarized in Sections 1.6 and 1.7 of this report, respectively. In order to close these items, the staff requires the additional information identified in this report. The staff will provide its conclusions on the review of the AP1000 standard design in the final report.