17 QUALITY ASSURANCE AND RELIABILITY ASSURANCE

This chapter describes the U.S. Nuclear Regulatory Commission (NRC or Commission) staff's review of the Advanced Power Reactor - 1400 (APR1400) Design Control Document (DCD), Tier 2, Chapter 17, "Quality Assurance and Reliability Assurance," Revision 0. DCD Tier 2, Chapter 17 discusses the quality assurance (QA) during the design phase, QA during the construction and operation phases, the QA program (QAP), the reliability assurance program (RAP) and the QAP description (QAPD) for the design certification (DC). It also discusses the position of Korea Hydro & Nuclear Power Company, Ltd. (KHNP), the DC applicant, regarding a combined license (COL) applicant's responsibility for developing a QAP for the construction and operations phase and a program for implementation of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," the Maintenance Rule in Section 17.6. The QAP described in Sections 17.1, "Quality Assurance during the Design Certification Phase," 17.2," Quality Assurance during the Operations Phase," 17.3," Quality Assurance Program Description," and 17.5, "Quality Assurance Program Description – Design Certification" of Chapter 17 of DCD Tier 2 is applicable for QA during the DC phase for APR1400 standard plant design activities. The RAP described in Section 17.4 of DCD Tier 2 applies to those structures, systems, and components (SSCs) that are identified as being risk-significant or significant contributors to plant safety.

17.0 Quality Assurance and Reliability Assurance

The KHNP QAP used for the APR1400 design certification is described in KHNP Topical Report APR1400-K-Q-TR-11005-NP, Revision 5, "Quality Assurance Program Description (QAPD) for the APR1400 Design Certification," dated May 2, 2016 (Agencywide Documents Management and Access System (ADAMS) Accession No. ML16123A404), which was approved by the staff on October 6, 2016 (ML16265A505). The KHNP QAP topical report covers the activities associated with the certification of the APR1400 design. The QAP is based on the applicable portions of both Appendix B, "General Design Criteria for Nuclear Power Plants," to Part 50, "Domestic Licensing of Production and Utilization Facilities," of 10 CFR and the American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) standard NQA-1-~~1994~~, "Quality Assurance Requirements for Nuclear Applications," relevant to the KHNP DCD Tier 2.

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17.1 Quality Assurance during the Design Certification Phase

17.1.1 Introduction

The KHNP QA program for the APR1400 during the design certification phase is described in Tier 2, Section 17.1. The staff reviewed 17.1 in accordance with Section 17.5, "Quality Assurance Program Description – Design Certification, Early Site Permit and New License Applicants," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP) and that evaluation is in Section 17.5 of this safety evaluation report (SER).