



NuScale Standard Plant  
Design Certification Application

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## Chapter Sixteen **Technical Specifications**

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## **PART 2 - TIER 2**

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## **TABLE OF CONTENTS**

<b>CHAPTER 16 TECHNICAL SPECIFICATIONS.....</b>	<b>16.1-1</b>
<b>16.1 Technical Specifications.....</b>	<b>16.1-1</b>
16.1.1 Introduction to Technical Specifications .....	16.1-1
16.1.2 References .....	16.1-3

## CHAPTER 16 TECHNICAL SPECIFICATIONS

### 16.1 Technical Specifications

#### 16.1.1 Introduction to Technical Specifications

##### Technical Specification Content

The NuScale Power, LLC (NuScale) Generic Technical Specifications (GTS) meet the 10 CFR 50.36 and 10 CFR 50.36a requirements and were developed consistent with the Improved Standard Technical Specification (ISTS) format and content typified in NUREG-1431, Revision 4 and NUREG-1432, Revision 4. The content differs from the ISTS as necessary to reflect technical differences between large light water reactor (LWR) designs and the NuScale Power Plant design. For example, Table 1.1 of the NuScale GTS lists five MODES that are distinct from those provided in ISTS for pressurized water reactor or boiling water reactor designs.

The NuScale Power Plant design is a single facility that is comprised of 12 individual NuScale Power Modules (NPMs), each of which constitutes a nuclear steam supply system as described in Section 1.2. Individual NPMs are installed in an operating position during power generation and transferred to a common refueling location when refueled as described in Section 9.1.

The NuScale GTS are constructed to address the NuScale Power Plant design by providing operating limitations for an individual NPM.

The majority of the NuScale GTS address conditions applicable to an individual NPM. However, some systems and parameters are applicable to multiple NPMs. While individually specified, these limits may be applicable to more than one NPM at the same time. Clarifications have been included in the associated bases to address multi-module interactions.

##### Selection Criteria for Limiting Conditions for Operation

Limiting conditions for operation (LCOs) are included in the NuScale GTS consistent with the screening criteria provided in 10 CFR 50.36(c)(2)(ii). These selection criteria are:

- 1) Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
- 2) A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
- 3) A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- 4) A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

Information regarding the screening process employed by NuScale is provided in Technical Report TR-1116-52011 (Reference 16.1-1), and the results are incorporated into the bases of each technical specification.

NuScale considered risk-informed technical specification development approaches consistent with Regulatory Guide 1.177, and the guidance in NEI 04-10 and NEI 06-09 (Reference 16.1-2 and Reference 16.1-3). However as a new design with low overall evaluated risk but no applicable operating experience, completion times and surveillance intervals are proposed that are generally consistent with corresponding industry systems or functions as included in the NUREG STS. Reference to the comparable specifications is provided in Technical Report TR-1116-52011 (Reference 16.1-1).

The NuScale Power Plant systems used for MODE reduction differ from those systems in large LWR designs and do not meet the criteria in 10 CFR 50.36. Therefore, LCO requirements for those systems are not specified in the NuScale GTS.

For example, in typical large PWRs safety-related shutdown cooling function is required to operate and reduce primary system temperatures, and to support low-temperature overpressure protection. This shutdown cooling system is cooled by an intermediate closed-loop system to transfer decay heat to another cooling system that transfers the decay heat to the ultimate heat sink. Those safety-related functions are required to be operable and included in the technical specifications by criteria two or three of 10 CFR 50.36(c)(2)(ii).

At NuScale, shutdown cooling is accomplished in the design using passive convection and conduction of decay heat from the flooded portion of the containment through the containment vessel wall directly to the ultimate heat sink. The LTOP function is provided by instrumentation and valves that perform the ECCS function during power operations. These NuScale systems are included in the proposed GTS in accordance with 10 CFR 50.36(c)(2)(ii) however distinct shutdown cooling pumps, valves, LTOP valves, intermediate cooling loops are not credited or provided. Therefore they are not included for the NuScale GTS.

#### Completion Times and Surveillance Frequencies

When appropriate, the completion times and surveillance frequencies specified in the NuScale GTS are consistent with times and frequencies applied to similar actions and surveillance requirements from NUREG-1431 and NUREG-1432. The bases for completion times and surveillance frequencies for those NuScale GTS for which no large LWR system or function exists, and for those NuScale system design differences which lead to deviations from similar completion times and surveillance frequencies found in the ISTS or other recently-approved technical specifications are described in the associated bases or in the surveillance frequency control program described in technical specification 5.5.11.

Incorporation of Technical Specification Task Force Change Travelers

Technical Specification Task Force (TSTF) travelers issued since publication of Revision 4 of the ISTS were reviewed in the development of the NuScale GTS. Travelers were incorporated into the NuScale GTS or utilized as a basis for similar NuScale situations as described in the conformance report (Reference 16.1-1). The TSTF travelers considered in development of the NuScale GTS are listed in that report.

The GTS are intended to be used as a guide in the development of the plant-specific technical specifications. Preliminary information has been provided in single brackets [ ]. Combined license applicants referencing the NuScale Power Plant are required to provide the final plant-specific information.

COL Item 16.1-1: A COL applicant that references the NuScale Power Plant design certification will provide the final plant-specific information identified by [ ] in the generic Technical Specifications.

**16.1.2 References**

- 16.1-1 Technical Report TTR-1116-52011, "Technical Specifications Regulatory Conformance and Development Technical Report," Rev. 0.
- 16.1-2 NEI 04-10, Risk-Informed Technical Specifications Initiative 5b - Risk-Informed Method for Control of Surveillance Frequencies - Industry Guidance Document, Rev. 1, April 2007.
- 16.1-3 NEI 06-09, Risk-Informed Technical Specifications Initiative 4b - Risk-Managed Technical Specifications (RMTS) Guidelines - Industry Guidance Document, Rev. 0-A, November 2006.