NuScaleDCRaisPEm Resource

From:	Cranston, Gregory
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To:	Request for Additional Information
Cc:	Lee, Samuel; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource; Santos, Cayetano
Subject:	Request for Additional Information No. 522 eRAI No. 9681 (14)
Attachments:	RAI 9681 Attachments only Rev2.pdf; Request for Additional Information No. 522 (eRAI No. 9681).pdf

This supersedes the recall of 5/21/19.

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application and an attachment regarding Chapter 1.

Please submit your technically correct and complete response by July 15, 2019, to the RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

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CHAPTER 1 INTRODUCTION

1.0 Introduction

This document presents the Tier 1 information developed for the NuScale, LLC Power Plant. The Tier 1 information is the information that is to be certified through rulemaking and includes the Inspections, Tests, Analyses, and Acceptance Criteria required by 10 CFR 52.47(b)(1).

Tier 1 includes the following information:

- definitions
- general provisions
- design descriptions
- Inspections, Tests, Analyses, and Acceptance Criteria
- site parameters
- interface requirements

The information presented in Tier 1 is consistent with the information presented in Tier 2.

A graded approach is employed relative to the level of design information presented in Tier 1, i.e., the amount of design information presented is proportional to the safety significance of the structures, systems, and components being addressed.

1.1 Definitions

The definitions below apply to terms that may be used in the design descriptions and associated Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC).

Acceptance Criteria refers to the performance, physical condition, or analysis result for structures, systems, and components (SSC), or program that demonstrates that the design commitment is met.

Analysis means a calculation, mathematical computation, or engineering or technical evaluation. Engineering or technical evaluations could include, but are not limited to, comparisons with operating experience or design of similar SSC.

Approved design means the design as described in the updated final safety analysis report (UFSAR), including any changes to the final safety analysis report (FSAR) since submission to the NRC of the last update of the FSAR.

As-built means the physical properties of an SSC following the completion of its installation or construction activities at its final location at the plant site. In cases where it is technically justifiable, determination of physical properties of the as-built SSC may be based on measurements, inspections, or tests that occur prior to installation, provided that subsequent fabrication, handling, installation, and testing do not alter the properties.

ASME Code means Section III of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, as incorporated by reference in 10 CFR 50.55a with specific conditions or in accordance with relief granted or alternatives authorized by the NRC pursuant to 10 CFR 50.55a~~endorsed in 10 CFR 50.55a~~, unless a different section of the ASME Code is specifically referenced.

ASME Code Data Report means a document that certifies that a component or system is constructed in accordance with the requirements of the ASME Code. This data is recorded on a form approved by the ASME.

Common or Shared ITAAC means ITAAC that are associated with common or shared SSC and activities that support multiple NPMs. This includes (1) SSC that are common or shared by multiple NPMs, and for which the interface and functional performance requirements between the common or shared SSC and each NPM are identical, or (2) analyses or other generic design and qualification activities that are identical for each NPM (e.g., environmental qualification of equipment). For a multi-module plant, satisfactory completion of a common or shared ITAAC for the lead NPM shall constitute satisfactory completion of the common or shared ITAAC for associated NPMs.

Component, as used for reference to ASME Code components, means a vessel, concrete containment, pump, pressure relief valve, line valve, storage tank, piping system, or core support structure that is designed, constructed, and stamped in accordance with the rules of the ASME Code. ASME Code Section III classifies a metal containment as a vessel.

Design Commitment means that portion of the design description that is verified by ITAAC.

Design Description means that portion of the design that is certified. Design descriptions consist of a system description, system description tables, system description figures, and design commitments. System description tables and system description figures are only used when appropriate. The system description is not verified by ITAAC; only the design commitments are verified by ITAAC. System description tables and system description figures are only verified by ITAAC if they are referenced in the ITAAC table.

Inspect or **Inspection** means visual observations, physical examinations, or reviews of records based on visual observation or physical examination that compare (a) the SSC condition to one or more design commitments or (b) the program implementation elements to one or more program commitments, as applicable. Examples include walkdowns, configuration checks, measurements of dimensions, or nondestructive examinations. The terms, inspect and inspection, also apply to the review of Emergency Planning ITAAC requirements to determine whether ITAAC are met.

ITAAC are those Inspections, Tests, Analyses, and Acceptance Criteria identified in the combined license that if met by the licensee are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the Atomic Energy Act, as amended, and the Commission's rules and regulations.

Module-Specific ITAAC means ITAAC that are associated with SSC that are specific to and support operation of a single, individual NuScale Power Module. Module-specific ITAAC shall be satisfactorily completed for each NuScale Power Module.

NuScale Power Module (NPM) is a collection of systems, sub-systems, and components that together constitute a modularized, movable, nuclear steam supply system. The NPM is composed of a reactor core, a pressurizer, and two steam generators integrated within a reactor pressure vessel and housed in a compact steel containment vessel.

Reconciliation or **Reconciled** means the identification, assessment, and disposition of differences between a design feature as described in the Updated Final Safety Analysis Report (UFSAR) ~~an approved design feature~~ and an as-built plant design feature. For ASME Code piping systems, it is the reconciliation of differences between the design feature as described in the UFSAR ~~approved design~~ and the as-built piping system. For structural features, it is the reconciliation of differences between the design as described in the UFSAR ~~approved design~~ and the as-built structural feature.

Report, as used in the ITAAC table Acceptance Criteria column, means a document that verifies that the acceptance criteria of the subject ITAAC have been met and references the supporting documentation. The report may be a simple form that consolidates all of the necessary information related to the closure package for supporting successful completion of the ITAAC.

~~**Common or Shared ITAAC** means ITAAC that are associated with common or shared SSC and activities that support multiple NPMs. This includes (1) SSC that are common or shared by multiple NPMs, and for which the interface and functional performance requirements between the common or shared SSC and each NPM are identical, or (2) analyses or other generic design and qualification activities that are identical for each NPM (e.g., environmental qualification of equipment). For a multi-module plant, satisfactory completion of a common or shared ITAAC for the lead NPM shall constitute satisfactory completion of the common or shared ITAAC for associated NPMs.~~

Safe Shutdown Earthquake (SSE) Ground Motion is the site-specific vibratory ground motion for which safety-related SSC are designed to remain functional. The SSE for a site is a smoothed spectra developed to envelop the ground motion response spectra. The SSE is characterized at the free ground surface. A combined license (COL) applicant may use the SSE for design of site-specific SSC.

System Description (Tier 1) includes

- a concise description of the system's or structure's safety-related functions, nonsafety-related functions that support safety-related functions, and certain nonsafety risk-significant functions.
- a listing of components required to perform those functions.
- identification of the system safety classification.

- the system components' general locations.

The system description may include system description tables and figures.

Test means actuation or operation, or establishment of specified conditions, to evaluate the performance or integrity of as-built SSC, unless explicitly stated otherwise, to determine whether ITAAC are met.

Tier 1 means the portion of the design-related information contained in the generic Design Control Document that is approved and certified by the design certification rule (Tier 1). The design descriptions, interface requirements, and site parameters are derived from Tier 2 information. Tier 1 includes:

- definitions and general provisions
- design descriptions
- ITAAC
- significant site parameters
- significant interface requirements

~~**Type Test** means a test on one or more sample components of the same type and manufacturer to qualify other components of the same type and manufacturer. A type test is not necessarily a test of an as-built SSC.~~

Top-Level Design Features means the principal performance characteristics and physical attributes that are important to performing the safety-related and certain nonsafety-related functions of the plant.

Type Test means a test on one or more sample components of the same type and manufacturer to qualify other components of the same type and manufacturer. A type test is not necessarily a test of an as-built SSC.

~~**Module-Specific ITAAC** means ITAAC that are associated with SSC that are specific to and support operation of a single, individual NuScale Power Module. Module-specific ITAAC shall be satisfactorily completed for each NuScale Power Module.~~

1.2 General Provisions

1.2.1 Design Descriptions

Design descriptions pertain only to the structures, systems, and components (SSC) of the standard design and not to their operation and maintenance after fuel load. In the event of an inconsistency between the design descriptions and the Tier 2 information, the design descriptions in Tier 1 shall govern.

Design descriptions consist of system descriptions, system description tables, system description figures, and design commitments. System description tables and system description figures are only used when appropriate. The system description provides a concise description of the top-level design features and performance characteristics of the SSC system functions, safety classification, and general location. The system description only describes those portions of the system or structure that are important to the top-level design features and performance characteristics of the system or structure. Design commitments are provided in numbered paragraphs that are used to develop the Design Commitment column in the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) table. These commitments address top-level design features and performance characteristics such as:

- seismic classification
- American Society of Mechanical Engineers Code classification
- Class 1E SSC
- equipment to be qualified for harsh environments
- instrumentation and controls equipment to be qualified for other than harsh environments

The absence of discussion or depiction of SSC in the design description shall not be construed as prohibiting a licensee from using such SSC, unless it would prevent SSC from performing a top-level design feature or performance characteristic, or impairing the performance of those functions, as discussed or depicted in the design description.

When the term “operate,” “operates,” or “operation” is used with respect to equipment discussed in the acceptance criteria, it refers to the actuation or control of the equipment.

1.2.2 Interpretation of System Description Tables

Cells with no values in system description tables contain an “N/A” to denote that the cell is “not applicable.”

1.2.3 Interpretation of System Description Figures

Figures are provided for some systems or structures with the amount of information depicted based on their safety significance. These figures may represent a functional diagram, general structural representation, or other general illustration. Unless specified, these figures are not indicative of the scale, location, dimensions, shape, or spatial relationships of as-built SSC. In particular, the as-built attributes of SSC may vary from the attributes depicted on these figures, provided that the top-level design features discussed in the design description pertaining to the figure are not adversely affected. Valve position indications shown on system description figures do not represent a specific operational state.

The figure legends in Tier 2 Section 1.7 are used to interpret Tier 1 system description figures.

1.2.4 Implementation of Inspections, Tests, Analyses, and Acceptance Criteria

Design commitments and, inspections, tests, analyses, and acceptance criteria are provided in ITAAC tables with the following format:

No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria

Each commitment in the "Design Commitment" column of the ITAAC tables has one or more associated requirements for inspections, tests or analyses specified in the "Inspections, Tests, Analyses" column. Each inspection, test or analysis has an associated acceptance criterion in the third column of the ITAAC tables that demonstrate that the Design Commitment in the first column has been met.

Inspections, tests, or analyses may be performed by the licensee or by its authorized vendors, contractors, or consultants.

Inspections, tests, or analyses may be

- performed by more than a single individual or group.
- implemented through discrete activities separated by time.
- performed at any time prior to fuel load, including before issuance of the combined license for those ITAAC that do not require as-built equipment.
- performed at a location other than the construction site.

Additionally, inspections, tests, or analyses may be performed as part of other activities such as construction inspections and preoperational testing. Therefore, inspections, tests, or analyses need not be performed as a separate or discrete activity.

If an acceptance criteria does not specify the temperature, pressure, or other conditions under which an inspection or test must be performed, then the inspection or test conditions are not constrained.

Many of the Acceptance Criteria state that a report or analysis "exists and concludes that…" When these words are used, it indicates that the ITAAC for that Design Commitment will be met when it is confirmed that appropriate documentation exists and the documentation shows that the Design Commitment is met.

For the acceptance criteria, appropriate documentation may be a single document or a collection of documents that show that the stated acceptance criteria are met. Examples of appropriate documentation include:

- design reports

- test reports
- inspection reports
- analysis reports
- evaluation reports

- design and manufacturing procedures
- certified data sheets
- commercial grade dedication procedures and records
- quality assurance records
- calculation notes
- equipment qualification data packages

Conversion or extrapolation of test results from the test conditions to the design conditions may be necessary to satisfy an ITAAC. Suitable justification should be provided for ~~, and applicability of,~~ any ~~necessary~~ conversions or extrapolations of test results necessary to satisfy an ITAAC.

1.2.5 Acronyms and Abbreviations

The acronyms and abbreviations contained in Tier 2 Table 1.1-1 are applicable to Tier 1.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.1-4	NuScale Power Module ITAAC	1	The NuScale Power Module ASME Code Class 1, 2 and 3 piping systems listed in Table 2.1-1 comply with ASME Code Section III requirements.	An inspection will be performed of the NuScale Power Module ASME Code Class 1, 2 and 3 as-built piping system Design Reports required by ASME Code Section III.	The ASME Code Section III Design Reports (NCA-3550) exist and conclude that the NuScale Power Module ASME Code Class 1, 2 and 3 as- built piping systems listed in Table 2.1-1 meet the requirements of ASME Code Section III.
Table 2.1-4	NuScale Power Module ITAAC	2	The NuScale Power Module ASME Code Class 1, 2, and 3 components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the NuScale Power Module ASME Code Class 1, 2, and 3 as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the NuScale Power Module ASME Code Class 1, 2, and 3 components listed in Table 2.1-2 and interconnecting piping exist and conclude that the requirements of ASME Code Section III are met.
Table 2.1-4	NuScale Power Module ITAAC	3	The NuScale Power Module ASME Code Class CS components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the NuScale Power Module ASME Code Class CS as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the NuScale Power Module ASME Code Class CS components listed in Table 2.1-2 exist and conclude that the requirements of ASME Code Section III are met.
Table 2.1-4	NuScale Power Module ITAAC	4	Safety-related SSC are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	An inspection and analysis will be performed of the as-built high- and moderate-energy piping systems and protective features for the safety-related SSC.	Protective features are installed in accordance with the as-built Pipe Break Hazard Analysis Report and safety-related SSC are protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.
Table 2.1-4	NuScale Power Module ITAAC	5	The NuScale Power Module ASME Code Class 2 piping systems and interconnected equipment nozzles are evaluated for LBB.	An analysis will be performed of the ASME Code Class 2 as-built piping systems and interconnected equipment nozzles.	The as-built LBB analysis for the ASME Code Class 2 piping systems listed in Table 2.1-1 and interconnected equipment nozzles is bounded by the as-designed LBB analysis.
Table 2.1-4	NuScale Power Module ITAAC	6	The RPV beltline material has a Charpy upper-shelf energy of 75 ft-lb minimum.	A vendor test will be performed of the Charpy V-Notch specimen of the RPV beltline material.	An ASME Code Certified Material Test Report exists and concludes that the initial RPV beltline material Charpy upper-shelf energy is 75 ft-lb minimum.
Table 2.1-4	NuScale Power Module ITAAC	7	The CNV serves as an essentially leak- tight barrier against the uncontrolled release of radioactivity to the environment.	A leakage test will be performed of the pressure containing or leakage- limiting boundaries, and CIVs.	The leakage rate for local leak rate tests (Type B and Type C) for pressure containing or leakage-limiting boundaries and CIVs meets the requirements of 10 CFR Part 50, Appendix J.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.1-4	NuScale Power Module ITAAC	8	Containment isolation valve closure times limit potential releases of radioactivity.	A test will be performed of the automatic CIVs.	Each CIV listed in Table 2.1-3 travels from the full open to full closed position in less than or equal to the time listed in Table 2.1-3 after receipt of a containment isolation signal.
Table 2.1-4	NuScale Power Module ITAAC	9	The length of piping shall be minimized between the containment penetration and the associated outboard CIVs.	An inspection will be performed of the as-built piping between containment penetrations and associated outboard CIVs.	The length of piping between each containment penetration and its associated outboard CIV is less than or equal to the length identified in Table 2.1-1.
Table 2.1-4	NuScale Power Module ITAAC	10	The CNTS containment electrical penetration assemblies are sized to power their design loads.	i. An analysis will be performed of the CNTS as-designed containment electrical penetration assemblies. ii. An inspection will be performed of CNTS as-built containment electrical penetration assembly.	i. An electrical rating report exists that defines and identifies the required design electrical rating to power the design loads of each CNTS containment electrical penetration assembly listed in Table 2.1-3. ii. The electrical rating of each CNTS containment electrical penetration assembly listed in Table 2.1-3 is greater than or equal to the required design electrical rating as specified in the electrical rating report.
Table 2.1-4	NuScale Power Module ITAAC	11	Physical separation exists between the redundant divisions of the MPS Class 1E instrumentation and control current-carrying circuits, and between Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and current-carrying circuits. The scope of this commitment includes the cables from the NPM disconnect box to the instrument.	An inspection will be performed of the MPS Class 1E as-built instrumentation and control current-carrying circuits.	i. Physical separation between redundant divisions of MPS Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers. ii. Physical separation between MPS Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers.
Table 2.1-4	NuScale Power Module ITAAC	12	The RPV is provided with surveillance capsule holders to hold a capsule containing RPV material surveillance specimens at locations where the capsules will be exposed to a neutron flux consistent with the objectives of the RPV surveillance program.	An inspection will be performed of the as-built RPV surveillance capsule holders.	Four surveillance capsule holders are installed in the RPV beltline region at ~~approximately 90 degree intervals~~ locations where the capsules will be exposed to a neutron flux consistent with the objectives of the RPV surveillance program.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.1-4	NuScale Power Module ITAAC	13	The remotely-operated CNTS containment isolation valves change position under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the CNTS safety-related valves under preoperational temperature, differential pressure, and flow conditions.	Each remotely-operated CNTS containment isolation valve listed in Table 2.1-2 strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions.
Table 2.1-4	NuScale Power Module ITAAC	14	The ECCS safety-related valves listed in Table 2.1-2 change position under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the ECCS safety-related valves listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each ECCS safety-related valve listed in Table 2.1-2 strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions.
Table 2.1-4	NuScale Power Module ITAAC	15	The DHRS safety-related valves listed in Table 2.1-2 change position under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the DHRS safety-related valves listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each DHRS safety-related valve listed in Table 2.1-2 strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions.
Table 2.1-4	NuScale Power Module ITAAC	16	Not used.	Not used.	Not used.
Table 2.1-4	NuScale Power Module ITAAC	17	Not used.	Not used.	Not used.
Table 2.1-4	NuScale Power Module ITAAC	18	The CNTS safety-related hydraulic-operated valves listed in Table 2.1-2 fail to (or maintain) their safety-related position on loss of electrical power under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the CNTS safety-related hydraulic-operated valves listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each CNTS safety-related hydraulic-operated valve listed in Table 2.1-2 fails to (or maintains) its safety-related position on loss of motive power under preoperational temperature, differential pressure, and flow conditions.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.1-4	NuScale Power Module ITAAC	19	The ECCS ~~safety-related~~ RRVs and RVVs listed in Table 2.1-2 fail to (or maintain) their safety-related position on loss of electrical power to their corresponding trip valves under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the ECCS ~~safety-related~~ RRVs and RVVs listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each ECCS ~~safety-related~~ RRV and RVV listed in Table 2.1-2 fails to (or maintains) its safety-related position ~~open~~ on loss of electrical power to its corresponding trip valve under preoperational temperature, differential pressure, and flow conditions.
Table 2.1-4	NuScale Power Module ITAAC	20	The DHRS ~~safety-related~~ hydraulic- operated valves listed in Table 2.1-2 fail to (or maintain) their safety- related position on loss of electrical power under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the DHRS ~~safety-related~~ hydraulic-operated valves listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each DHRS ~~safety-related~~ hydraulic- operated valve listed in Table 2.1-2 fails to (or maintains) its safety-related position ~~open~~ on loss of motive power under preoperational temperature, differential pressure, and flow conditions.
Table 2.1-4	NuScale Power Module ITAAC	21	The CNTS ~~safety-related~~ check valves listed in Table 2.1-2 change position under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the CNTS ~~safety-related~~ check valves listed in Table 2.1-2 under preoperational temperature, differential pressure, and flow conditions.	Each CNTS ~~safety-related~~ check valve listed in Table 2.1-2 strokes fully open and closed (under forward and reverse flow conditions, respectively) under preoperational temperature, differential pressure, and flow conditions.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.1-4	NuScale Power Module ITAAC	22	Each CNTS containment electrical penetration assembly is rated either (i) to withstand fault and overload currents for the time required to clear the fault from its power source, or (ii) to withstand the maximum fault and overload current for its circuits without a circuit interrupting device.~~i. A CNTS containment electrical penetration assembly is rated to withstand fault currents for the time required to clear the fault from its power source.~~ ~~OR~~ ~~ii. A CNTS containment electrical penetration assembly is rated to withstand the maximum fault current for its circuits without a circuit interrupting device.~~	i. An analysis will be performed of the CNTS as-built containment electrical penetration assembly.	For each CNTS containment electrical penetration assembly listed in Table 2.1-3, either (i) a circuit interrupting device coordination analysis exists and concludes that the current carrying capability for the CNTS containment electrical penetration assembly is greater than the analyzed fault and overload currents for the time required to clear the fault from its power source, or (ii) an analysis of the CNTS containment electrical penetration maximum fault and overload current exists and concludes the fault and overload current is less than the current carrying capability of the CNTS containment electrical penetration. ~~i. A circuit interrupting device coordination analysis exists and concludes that the current carrying capability for each CNTS containment electrical penetration assembly listed in Table 2.1-3 is greater than the analyzed fault currents for the time required to clear the fault from its power source.~~ ~~OR~~ ~~ii. An analysis of the CNTS containment penetration maximum fault current exists and concludes the fault current is less than the current carrying capability of the CNTS containment electrical penetration~~
Table 2.1-4	NuScale Power Module ITAAC	23	The CNV serves as an essentially leaktight barrier against the uncontrolled release of radioactivity to the environment.	A preservice design pressure leakage test of the CNV will be performed.	No water leakage is observed at CNV bolted flange connections.
Table 2.1-4	NuScale Power Module ITAAC	24(RAI 9571, added this	The NMP lifting fixture supports its rated load	A rated load test will be performed of the NMP lifting fixture	The NMP lifting fixture supports a load of at least 150 ~~to 155~~ percent of the manufacture's rated capacity.
Table 2.1-4	NuScale Power Module ITAAC	25(RAI 9571, added this	The NMP lifting fixture is constructed to provide assurance that a single failure does not result in uncontrolled movement of the lifted load	An inspection will be performed of the as-built NMP lifting fixture.	The NMP lifting fixture is single-failure-proof

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.2-3	Chemical and Volume Control System ITAAC	1	The chemical and volume control system ASME Code Class 3 piping system complies with the ASME Code Section III.	An inspection will be performed of the chemical and volume control system ASME Code Class 3 as-built piping system Design Report required by ASME Code Section III.	The ASME Code Section III Design Report (NCA-3550) exists and concludes that the chemical and volume control system ASME Code Class 3 as-built piping system meets the requirements of ASME Code Section III.
Table 2.2-3	Chemical and Volume Control System ITAAC	2	The chemical and volume control system ASME Code Class 3 components conform to the rules of construction of ASME Code Section III	An inspection will be performed of the chemical and volume control system ASME Code Class 3 as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the chemical and volume control system ASME Code Class 3 components listed in Table 2.2-2 and interconnecting piping exist and conclude that the requirements of ASME Code Section III are met.
Table 2.2-3	Chemical and Volume Control System ITAAC	3	The chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valves change position under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valves under preoperational temperature, differential pressure, and flow conditions.	Each chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valve listed in Table 2.2-2 strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions.
Table 2.2-3	Chemical and Volume Control System ITAAC	4	Not used.	Not used.	Not used.
Table 2.2-3	Chemical and Volume Control System ITAAC	5	The chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valves perform their function to fail to (or maintain) their position on loss of motive power under design-basis temperature, differential pressure, and flow conditions.	A test will be performed of the chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valves under preoperational temperature, differential pressure and flow conditions.	Each chemical and volume control system ASME Code Class 3 air-operated demineralized water system supply isolation valve listed in Table 2.2-2 performs its function to fail to (or maintain) its position ~~performs fails closed~~ on loss of motive power under preoperational temperature, differential pressure, and flow conditions.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.3-1	Containment Evacuation System ITAAC	1	The CES level instrumentation supports RCS leakage detection.	A test will be performed of the CES level instrumentation.	The CES level instrumentation detects a level increase in the CES sample tank, which correlates to a detection of an unidentified RCS leakage rate of one gpm within one hour.
Table 2.3-1	Containment Evacuation System ITAAC	2	The CES pressure instrumentation supports RCS leakage detection.	A test will be performed of the CES pressure instrumentation.	The CES pressure instrumentation detects a pressure increase in the CES inlet pressure instrumentation (PIT-1001/PIT1019), which correlates to a detection of an unidentified RCS leakage rate of one gpm within one hour.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	1	The MPS design and software are implemented using a quality process composed of the following system design lifecycle phases, with each phase having outputs which satisfy the requirements of that phase. • System Functional Specification Phase • System Design Phase • System Prototype Development Phase • Equipment Requirements Specification Phase • Hardware Planning Phase • Hardware Requirements Phase • Hardware Design Phase • Software Planning Phase • Software Requirements Phase • Software Design Phase • Software Implementation Phase • Software Configuration Phase • System Testing Phase • System Installation Phase	i. An analysis will be performed of the output documentation of the System Functional Specification Phase. ii. An analysis will be performed of the output documentation of the System Design Phase. iii. An analysis will be performed of the output documentation of the System Prototype Development Phase. iv. An analysis will be performed of the output documentation of the Equipment Requirements Specification Phase. v. An analysis will be performed of the output documentation of the Hardware Planning Phase. vi. An analysis will be performed of the output documentation of the Hardware Requirements Phase. vii. An analysis will be performed of the output documentation of the Hardware Design Phase. viii. An analysis will be performed of the output documentation of the Software Planning Phase. ix. An analysis will be performed of the output documentation of the Software Requirements Phase. x. An analysis will be performed of the output documentation of the Software Design Phase. xi. An analysis will be performed of the output documentation of the Software Implementation Phase. xii. An analysis will be performed of the output documentation of the Software Configuration Phase. xiii. An analysis will be performed of the output documentation of the System Testing Phase. xiv. An analysis will be performed of the output documentation of the System Installation Phase.	i. The output documentation of the MPS Functional Specification Phase satisfies the requirements of the System Functional Specification Phase. ii. The output documentation of the MPS Design Phase satisfies the requirements of the System Design Phase. iii. The output documentation of the MPS Prototype Development Phase satisfies the requirements of the System Prototype Development Phase. iv. The output documentation of the MPS Equipment Requirements Specification Phase satisfies the requirements of the Equipment Requirements Specification Phase. v. The output documentation of the MPS Hardware Planning Phase satisfies the requirements of the Hardware Planning Phase. vi. The output documentation of the MPS Hardware Requirements Phase satisfies the requirements of the Hardware Requirements Phase. vii. The output documentation of the MPS Hardware Design Phase satisfies the requirements of the Hardware Design Phase. viii. The output documentation of the MPS Software Planning Phase satisfies the requirements of the Software Planning Phase. ix. The output documentation of the MPS Software Requirements Phase satisfies the requirements of the Software Requirements Phase. x. The output documentation of the MPS Software Design Phase satisfies the requirements of the Software Design Phase. xi. The output documentation of the MPS Software Implementation Phase satisfies the requirements of the Software Implementation Phase. xii. The output documentation of the MPS Software Configuration Phase satisfies the requirements of the Software Configuration Phase. xiii. The output documentation of the MPS Testing Phase satisfies the requirements of the System Testing Phase. xiv. The output documentation of the MPS Installation Phase satisfies the requirements of the System Installation Phase.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	2	Protective measures are provided to restrict modifications to the MPS tunable parameters.	A test will be performed on the access control features associated with MPS tunable parameters.	Protective measures restrict modification to the MPS tunable parameters without proper configuration and authorization.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	3	Physical separation exists (1) between each ~~the redundant~~ separation group~~s~~ of the MPS Class 1E instrumentation and control current-carrying circuits, ~~and~~(2) between each divisions of the MPS Class 1E instrumentation and control current-carrying circuits, and (3) between Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and control current-carrying circuits.	An inspection will be performed of the MPS Class 1E as-built instrumentation and control current- carrying circuits.	i. Physical separation between each ~~redundant~~ separation group~~s and divisions~~ of the MPS Class 1E instrumentation and control current- carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers. ii. Physical separation between each division of the MPS Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers. iii. Physical separation between MPS Class 1E instrumentation and control current-carrying circuits and non- Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	4	Electrical isolation exists (1) between each ~~the redundant~~ separation group~~s~~ of the MPS Class 1E instrumentation and control circuits, ~~and~~ (2) between each divisions~~s~~ of the MPS Class 1E instrumentation and control circuits, and (3) between Class 1E instrumentation and control circuits and non-Class 1E instrumentation and control circuits to prevent the propagation of credible electrical faults.	An inspection will be performed of the MPS Class 1E as-built instrumentation and control circuits.	i. Class 1E electrical isolation devices are installed between each ~~redundant~~ separation group~~s and divisions~~ of the MPS Class 1E instrumentation and control circuits. ii. Class 1E electrical isolation devices are installed between each division of the MPS Class 1E instrumentation and control circuits. ii. Class 1E electrical isolation devices are installed between MPS Class 1E instrumentation and control circuits and non-Class 1E instrumentation and control circuits.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	5	Electrical isolation exists between the EDSS-MS subsystem non-Class 1E circuits and connected MPS Class 1E circuits to prevent the propagation of credible electrical faults.	i. A type test, analysis, or a combination of type test and analysis will be performed of the Class 1E isolation devices. ii. An inspection will be performed of the MPS Class 1E as-built circuits.	i. The Class 1E circuit does not degrade below defined acceptable operating levels when the non-Class 1E side of the isolation device is subjected to the maximum credible voltage, current transients, shorts, grounds, or open circuits. ii. Class 1E electrical isolation devices are installed between the EDSS-MS Subsystem non-Class 1E circuits and connected MPS Class 1E circuits.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	6	Communications independence exists (1) between each ~~redundant~~ separation group~~s~~ of the Class 1E MPS and (2) between each division~~s~~ of the Class 1E MPS.	A test will be performed of the Class 1E MPS.	i. Communications independence between each ~~redundant~~ separation group~~s and divisions~~ of the Class 1E MPS is provided. ii. Communications independence between each division of the Class 1E MPS is provided.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	7	Communications independence exists between the Class 1E MPS and non-Class 1E digital systems.	A test will be performed of the Class 1E MPS.	Communications independence between the Class 1E MPS and non-Class 1E digital systems is provided.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	8	The MPS automatically initiates a reactor trip signal.	A test will be performed of the MPS.	A reactor trip signal is automatically initiated for each reactor trip function listed in Table 2.5-1.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	9	The MPS automatically initiates an ESF actuation signal.	A test will be performed of the MPS.	An ESF actuation signal is automatically initiated for each ESF function listed in Table 2.5-2.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	10	The MPS automatically actuates a reactor trip.	A test will be performed of the MPS.	The RTBs open upon an injection of a single simulated MPS reactor trip signal.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	11	The MPS automatically actuates the engineered safety feature equipment.	A test will be performed of the MPS.	The ESF equipment automatically actuates to perform its safety-related function listed in Table 2.5-2 upon an injection of a single simulated MPS signal.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	12	The MPS manually actuates a reactor trip.	A test will be performed of the MPS.	The RTBs open when a reactor trip is manually initiated from the main control room.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	13	The MPS manually actuates the ESF equipment.	A test will be performed of the MPS.	The MPS actuates the ESF equipment to perform its safety-related function listed in Table 2.5-3 when manually initiated.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	14	The reactor trip logic fails to a safe state such that loss of electrical power to a MPS separation group results in a trip state for that separation group.	A test will be performed of the MPS.	Loss of electrical power in a separation group results in a trip state for that separation group.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	15	The ESFs logic fails to a safe state such that loss of electrical power to a MPS separation group results in a safe state listed in Table 2.1-3. ~~predefined safe state for that separation group.~~	A test will be performed of the MPS.	Loss of electrical power in a separation group results in the safe state listed in Table 2.1-3. ~~an actuation state for that separation group.~~
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	16	An MPS signal once initiated (automatically or manually), results in an intended sequence of protective actions that continue until completion, and requires deliberate operator action in order to return the safety systems to normal.	A test will be performed of the MPS reactor trip and engineered safety features signals.	i. Upon initiation of a real or simulated MPS reactor trip signal listed in Table 2.5-1, the RTBs open, and the RTBs do not automatically close when the MPS reactor trip signal clears. ii. Upon initiation of a real or simulated MPS engineered safety feature actuation signal listed in Table 2.5-2, the ESF equipment actuates to perform its safety-related function and continues to maintain its safety- related position and perform its safety-related function when the MPS engineered safety feature actuation signal clears.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	17	The MPS response times from sensor output through equipment actuation for the reactor trip functions and ESF functions are less than or equal to the value required to satisfy the design basis safety analysis response time assumptions.	A test will be performed of the MPS.	The MPS reactor trip functions listed in Table 2.5-1 and ESFs functions listed in Table 2.5-2 have response times that are less than or equal to the design basis safety analysis response time assumptions.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	18	The MPS interlocks listed in Table 2.5-4 automatically establish an operating bypass for the specified reactor trip or ESF actuations when the interlock condition is met, and the operating bypass is automatically removed when the interlock condition is no longer satisfied. function as required when associated conditions are met.	A test will be performed of the MPS.	The MPS interlocks listed in Table 2.5-4 automatically establish an operating bypass for the specified reactor trip of or ESF actuations when the interlock condition is met. The operating bypass is automatically removed when the interlock condition is no longer satisfied.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	19	The MPS permissives listed in Table 2.5-4 allow the manual bypass of the specified reactor trip or ESF actuations when the permissive condition is met, and the operating bypass is automatically removed when the permissive condition is no longer satisfied. function as required when associated conditions are met.	A test will be performed of the MPS.	The MPS permissives listed in Table 2.5-4 allows the manual bypass of the specified reactor trip or ESF actuations when the permissive condition is met. The operating bypass is automatically removed when the permissive condition is no longer satisfied.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	20	The O-1 Override listed in Table 2.5-4 is The MPS overrides established when the manual override switch is active and the RT-1 interlock is established. The Override switch must be manually taken out of Override when the O-1 Override is no longer needed. function as required when associated conditions are met.	A test will be performed of the MPS.	The MPS overrides listed in Table 2.5-4 are The O-1 Override listed in Table 2.5-4 is established when the manual override switch is active and the RT-1 interlock is established. The Override switch must be manually taken out of Override when the Override, O-1 Override, is no longer needed.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	21	The MPS is capable of performing its safety-related functions ~~when one~~if any of its protection channels is ~~placed in maintenance bypass~~ out of service.	~~A test~~Tests will be performed of the MPS.	The MPS performs its safety-related functions if any of its protection channels is out of service. ~~With a safety function module out of service switch activated, the safety function is placed in trip or bypass based on the position of the safety function module trip/bypass switch~~.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	22	MPS operational bypasses are indicated in the MCR.	A test will be performed of the MPS.	Each operational MPS manual or automatic bypass is indicated in the MCR.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	23	MPS maintenance bypasses are indicated in the MCR.	A test will be performed of the MPS.	Each maintenance bypass is indicated in the MCR.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	24	The MPS self-test features detect faults in the system and provide an alarm in the main control room.	A test will be performed of the MPS.	A report exists and concludes that: • Self-testing features verify that faults requiring detection are detected. • Self-testing features verify that upon detection, the system responds according to the type of fault. • Self-testing features verify that faults are detected and responded within a sufficient timeframe to ensure safety function is not lost. • The presence and type of fault is indicated by the MPS alarms and displays.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	25	The PAM Type B and Type C displays are indicated on the SDIS displays in the MCR.	An inspection will be performed for the ability to retrieve the as-built PAM Type B and Type C displays on the SDIS displays in the MCR.	The PAM Type B and Type C displays listed in Table 2.5-5 are retrieved and displayed on the SDIS displays in the MCR.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	26	The controls located on the operator workstations in the MCR operate to perform IHAs.	A test will be performed of the controls on the operator workstations in the MCR.	The IHAs controls provided on the operator workstations in the MCR perform the functions listed in Table 2.5-6.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	27	The RTBs are installed and arranged in order to successfully accomplish the reactor trip function. ~~under design conditions.~~	An inspection will be performed of the as-built RTBs, including the connections for the shunt and undervoltage trip mechanism and auxiliary contacts.	The RTBs have the proper connections for the shunt and undervoltage trip mechanisms and auxiliary contacts, and are arranged as shown in Figure 2.5-2 to successfully accomplish the reactor trip function.
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	28	Two of the four separation groups and one of the two divisions of RTS and ESFAS will utilize a different programmable technology.	An inspection will be performed of the as-built MPS.	Separation groups A & C and Division I of RTS and ESFAS utilize a different programmable technology from separation groups B & D and Division II of RTS and ESFAS.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.5-7	Module Protection System and Safety Display and Indication System ITAAC	29	The MCR isolation switches that isolate the manual MCR switches from MPS in case of a fire in the MCR are located in the remote shutdown station.	An inspection will be performed of the location of the as-built MCR isolation switches.	The MCR isolation switches are located in the remote shutdown station.
Table 2.6-1	Neutron Monitoring ITAAC	1	Electrical isolation exists between the NMS Class 1E circuits and connected non-Class 1E circuits to prevent the propagation of credible electrical faults.	i. A type test, analysis, or acombination of type test and analysis will be performed of the Class 1E isolation devices. ii. An inspection will be performed of the NMS Class 1E as-built circuits.	i. The Class 1E circuit does not degrade below defined acceptable operating levels when the non- Class 1E side of the isolation device is subjected to the maximum credible voltage, current transients, shorts, grounds, or open circuits. ii. Class 1E electrical isolation devices are installed between NMS Class 1E circuits and connected non- Class 1E circuits.
Table 2.6-1	Neutron Monitoring ITAAC	2	Physical separation exists between the redundant divisions of the NMS Class 1E instrumentation and control current-carrying circuits, and between Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and control current-carrying circuits.	An inspection will be performed of the NMS Class 1E as-built instrumentation and control current-carrying circuits.	i. Physical separation between redundant divisions of NMS Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers. ii. Physical separation between NMS Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of separation distance and barriers.
Table 2.6-1	Neutron Monitoring ITAAC	3	Electrical isolation exists between the redundant divisions of the NMS Class 1E instrumentation and control circuits, and between Class 1E instrumentation and control circuits and non-Class 1E instrumentation and control circuits to prevent the propagation of credible electrical faults.	An inspection will be performed of the NMS Class 1E as-built instrumentation and control circuits.	i. Class 1E electrical isolation devices are installed between redundant divisions of NMS Class 1E instrumentation and control circuits. ii. Class 1E electrical isolation devices are installed between NMS Class 1E instrumentation and control circuits and non-Class 1E instrumentation and control circuits.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.7-2	Radiation Monitoring - Module-Specific ITAAC	1	The CES automatically responds to a high radiation signal from CES-RT- 1011 to mitigate a release of radioactivity.	A test will be performed of the CES high radiation signal.	Upon initiation of a real or simulated CES high radiation signal listed in Table 2.7-1, the CES automatically aligns/actuates the identified components to the positions identified in the table.
Table 2.7-2	Radiation Monitoring - Module-Specific ITAAC	2	The CVCS automatically responds to ~~a~~ high radiation signal<ins>s</ins> from CVC-RT- 3016<ins>, 6A-AB-RT- 0142, and 6B-AB-RT- 0141-</ins> to mitigate a release of radioactivity.	A test will be performed of the CVCS high radiation signal<ins>s</ins>.	Upon initiation of a real or simulated CVCS high radiation signal listed in Table 2.7-1, the CVCS automatically aligns/actuates the identified component to the position identified in the table.
Table 2.7-2	Radiation Monitoring - Module-Specific ITAAC	~~3~~	~~The CVCS automatically responds to a high radiation signal from 6A-AB-RT- 0142 to mitigate a release of radioactivity~~.	~~A test will be performed of the CVCS high radiation signal.~~	~~Upon initiation of a real or simulated CVCS high radiation signal listed in Table 2.7-1, the CVCS automatically aligns/actuates the identified component to the position identified in the table.~~
Table 2.7-2	Radiation Monitoring - Module-Specific ITAAC	~~4~~	~~The CVCS automatically responds to a high radiation signal from 6B-AB-RT- 0141 to mitigate a release of radioactivity.~~	~~A test will be performed of the CVCS high radiation signal.~~	~~Upon initiation of a real or simulated CVCS high radiation signal listed in Table 2.7-1, the CVCS automatically aligns/actuates the identified component to the position identified in the table.~~

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.8-2	Equipment Qualification ITAAC	1	The module-specific Seismic Category I equipment listed in Table 2.8-1, including its associated supports and anchorages, withstands design basis seismic loads without loss of its function(s) during and after an SSE. The scope of equipment for this design commitment is module- specific, safety-related equipment, and module-specific, nonsafety-related equipment that has one of the following design features: • Nonsafety-related mechanical and electrical equipment located within the boundaries of the NuScale Power Module that has an augmented Seismic Category I design requirement. • Nonsafety-related mechanical and electrical equipment that performs a credited function in Chapter 15 analyses (secondary main steam isolation valves (MSIV), feedwater regulating valves (FWRV) and secondary feedwater check valves.)	i. A type test, analysis, or acombination of type test and analysis will be performed of the module-specific Seismic Category I equipment, including its associated supports and anchorages. ii. An inspection will be performed of the module-specific Seismic Category I as-built equipment, including its associated supports and anchorages.	i. A seismic qualification record form exists and concludes that the module-specific Seismic Category I equipment listed in Table 2.8-1, including its associated supports and anchorages, will withstand the design basis seismic loads and perform its function(s) during and after an SSE. ii. The module-specific Seismic Category I equipment listed in Table 2.8-1, including its associated supports and anchorages, is installed in its design location in a Seismic Category I structure in a configuration bounded by the equipment's seismic qualification record form.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.8-2	Equipment Qualification ITAAC	2	The module-specific electrical equipment located in a harsh environment, including associated connection assemblies, withstand the design basis harsh environmental conditions experienced during normal operations, AOOs, DBAs, and post- accident conditions and performs its function for the period of time required to complete the function. The scope of equipment for this design commitment is module-specific, Class 1E equipment located within a harsh environment, and module-specific, nonsafety-related equipment with an augmented equipment qualification design requirement located within the boundaries of the NuScale Power Module.	i. A type test or a combination of type test and analysis will be performed of the module-specific electrical equipment, including associated connection assemblies. ii. An inspection will be performed of the module-specific as-built electrical equipment, including associated connection assemblies.	i. An EQ record form exists and concludes that the module- specific electrical equipment listed in Table 2.8-1, including associated connection assemblies, perform their function under the environmental conditions specified in the EQ record form for the period of time required to complete the function. ii. The module-specific electrical equipment listed in Table 2.8-1, including associated connection assemblies, are installed in their design location in a configuration bounded by the EQ record form.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.8-2	Equipment Qualification ITAAC	3	The non-metallic parts, materials, and lubricants used in module-specific mechanical equipment perform their function up to the end of their qualified life in the design basis harsh environmental conditions (both internal service conditions and external environmental conditions) experienced during normal operations, AOOs, DBAs, and post- accident conditions. The scope of equipment for this design commitment is module-specific, safety-related mechanical equipment, and module-specific, nonsafety-related mechanical equipment that performs a credited function in Chapter 15 analyses (secondary main steam isolation valves (MSIV), feedwater regulating valves (FWRV) and secondary feedwater check valves.)	A type test or a combination of type test and analysis will be performed of the non-metallic parts, materials, and lubricants used in module-specific mechanical equipment.	A qualification record form exists and concludes that the non-metallic parts, materials, and lubricants used in module-specific mechanical equipment listed in Table 2.8-1 perform their function up to the end of their qualified life under the design basis harsh environmental conditions (both internal service conditions and external environmental conditions) specified in the qualification record form.
Table 2.8-2	Equipment Qualification ITAAC	4	The Class 1E computer-based instrumentation and control systems located in a mild environment withstand design basis mild environmental conditions without loss of safety-related functions.	i. A type test or a combination of type test and analysis will be performed of the Class 1E computer-based instrumentation and control systems located in a mild environment. ii. An inspection will be performed of the Class 1E as-built computer- based instrumentation and control systems located in a mild environment.	i. An EQ record form exists and concludes that the Class 1E computer-based instrumentation and control systems listed in Table 2.8-1 perform their function under the environmental conditions specified in the EQ record form. ii. The Class 1E computer-based instrumentation and control systems listed in Table 2.8-1 are installed in their design location in a configuration bounded by the EQ record form.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.8-2	Equipment Qualification ITAAC	5	The Class 1E digital equipment performs its safety-related function when subjected to the design basis electromagnetic interference, radio frequency interference, and electrical surges that would exist before, during, and following a DBA.	A type test, analysis, or a combination of type test and analysis will be performed of the Class 1E digital equipment.	An EQ record form exists and concludes that the Class 1E digital equipment listed in Table 2.8-1 withstands the design basis electromagnetic interference, radio frequency interference, and electrical surges that would exist before, during, and following a DBA without loss of safety-related function.
Table 2.8-2	Equipment Qualification ITAAC	6	The ~~safety-related~~ valves listed in Table 2.8-1 are functionally designed and qualified to perform their safety-related function under the full range of fluid flow, differential pressure, electrical ~~conditions~~, temperature ~~conditions~~, and fluid conditions up to and including DBA conditions.	A type test or a combination of type test and analysis will be performed of the ~~safety-related~~ valves listed in Table 2.8-1.	A Qualification Report exists and concludes that the ~~safety-related~~ valves listed in Table 2.8-1 are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical ~~conditions~~, temperature ~~conditions~~, and fluid conditions up to and including DBA conditions.
Table 2.8-2	Equipment Qualification ITAAC	7	The safety-related relief valves provide overpressure protection.	i. A vendor test will be performed of each safety-related relief valve~~s~~. ii. An inspection will be performed of each safety-related as-built relief valve~~s~~.	i. An American Society of Mechanical Engineers Code Section III Data Report exists and concludes that the relief valves listed in Table 2.8-1 meet the valve's required set pressure, capacity, and overpressure design requirements. ii. Each relief valve listed in Table 2.8-1 is provided with an American Society of Mechanical Engineers Code Certification Mark that identifies the set pressure, capacity, and overpressure.
Table 2.8-2	Equipment Qualification ITAAC	8	The ~~safety-related~~ DHRS ~~passive~~ condensers listed in Table 2.8-1 have the capacity to transfer their design heat load.	A type test or a combination of type test and analysis will be performed of the ~~safety-related~~ DHRS ~~passive~~ condensers listed in Table 2.8-1.	A report exists and concludes that the ~~safety-related~~ DHRS ~~passive~~ condensers listed in Table 2.8-1 have a heat removal capacity sufficient to transfer their design heat load.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 2.8-2	Equipment Qualification ITAAC	9	The CNTS containment electrical penetration assemblies located in a harsh environment, including associated connection assemblies, withstand the design basis harsh environmental conditions experienced during normal operations, AOOs, DBAs, and postaccident conditions and performs its function for the period of time required to complete the function.	i. A type test or a combination of type test and analysis will be performed of the CNTS containment electrical penetration assemblies equipment including associated connection assemblies. ii. An inspection will be performed of the containment CNTS electrical penetration assembles, including associated connection assemblies.	i. An EQ record form exists and concludes that the CNTS electrical penetration assemblies listed in Table 2.8-1, including associated connection assemblies, performs their function under the environmental conditions specified in the EQ record form for the period of time required to complete the function. ii. The CNTS electrical penetration assemblies listed in Table 2.8-1, including associated connection assemblies, are installed in their design location in a configuration bounded by the EQ record form.
Table 3.1-2	Control Room Habitability System ITAAC	1	The air exfiltration out of the CRE meets the assumptions used to size the CRHS inventory and the supply flow rate.	A test will be performed of the CRE.	The air exfiltration measured by tracer gas testing meets the air exfiltration assumed in the CRHS breathing and pressurization analysis. ~~is less than the CRE air infiltration rate assumed in the dose analysis.~~
Table 3.1-2	Control Room Habitability System ITAAC	2	The CRHS valves change position under design basis temperature, differential pressure, and flow conditions.	A test will be performed of the CRHS valves under preoperational temperature, differential pressure, and flow conditions.	Each CRHS valve listed in Table 3.1-1 strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions.
Table 3.1-2	Control Room Habitability System ITAAC	3	The CRHS solenoid-operated valves perform their function to fail open on loss of motive power under design basis temperature, differential pressure, and flow conditions.	A test will be performed of the CRHS solenoid-operated valves under preoperational temperature, differential pressure and flow conditions.	Each CRHS solenoid-operated valve listed in Table 3.1-1 performs its function to fail open on loss of motive power under preoperational temperature, differential pressure, and flow conditions.
Table 3.1-2	Control Room Habitability System ITAAC	4	The CRE heat sink passively maintains the temperature of the CRE within an acceptable range for the first 72 hours following a DBA.	An analysis will be performed of the as-built CRE heat sinks.	A report exists and concludes that the CRE heat sink passively maintains the temperature of the CRE within an acceptable range for the first 72 hours following a DBA.
Table 3.1-2	Control Room Habitability System ITAAC	5	The CRHS maintains a positive pressure in the MCR relative to adjacent areas.	A test will be performed of the CRHS.	The CRHS maintains a positive pressure of greater than or equal to 1/8 inches water gauge in the CRE relative to adjacent areas, while operating in DBA alignment.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.2-2	Normal Control Room Heating Ventilation and Air Conditioning ITAAC	1	The CRVS air-operated CRE isolation dampers perform their function to fail to the closed position on loss of motive power under design basis temperature, differential pressure, and flow conditions.	A test will be performed of the air-operated CRE isolation dampers under preoperational temperature, differential pressure and flow conditions.	Each CRVS air-operated CRE isolation damper listed in Table 3.2-1 performs its function to fail to the closed position on loss of motive power under preoperational temperature, differential pressure, and flow conditions.
Table 3.2-2	Normal Control Room Heating Ventilation and Air Conditioning ITAAC	2	The CRVS maintains a positive pressure in the CRB relative to the outside environment.	A test will be performed of the CRVS while operating in the normal operating alignment.	The CRVS maintains a positive pressure of greater than or equal to 1/8 inches water gauge in the CRB relative to the outside environment, while operating in the normal operating alignment.
Table 3.2-2	Normal Control Room Heating Ventilation and Air Conditioning ITAAC	3	The CRVS maintains the hydrogen concentration levels in the CRB battery rooms containing batteries below one percent by volume.	A test will be performed of the CRVS while operating in the normal operating alignment.	The airflow capability of the CRVS maintains the hydrogen concentration levels in the CRB battery rooms containing batteries below one percent by volume.
Table 3.3-1	Reactor Building Heating Ventilation and Air Conditioning System ITAAC	1	The RBVS maintains a negative pressure in the RXB relative to the outside environment.	A test will be performed of the RBVS while operating in the normal operating alignment.	The RBVS maintains a negative pressure in the RXB relative to the outside environment, while operating in the normal operating alignment.
Table 3.3-1	Reactor Building Heating Ventilation and Air Conditioning System ITAAC	2	The RBVS maintains a negative pressure in the RWB relative to the outside environment.	A test will be performed of the RBVS while operating in the normal operating alignment.	The RBVS maintains a negative pressure in the RWB relative to the outside environment, while operating in the normal operating alignment.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.3-1	Reactor Building Heating Ventilation and Air Conditioning System ITAAC	3	The RBVS maintains the hydrogen concentration levels in the RXB battery rooms containing batteries below one percent by volume.	A test will be performed of the RBVS while operating in the normal operating alignment.	The airflow capability of the RBVS maintains the hydrogen concentration levels in the RXB battery rooms containing batteries below one percent by volume.
Table 3.4-1	Fuel Handling Equipment System ITAAC	1	The single-failure-proof FHM main and auxiliary hoists are constructed to provide assurance that a failure of a single hoist mechanism component does not result in the uncontrolled movement of the lifted load.The FHM main and auxiliary hoists are single-failure-proof in accordance with the approved design.	An inspection will be performed of the as-built FHM main and auxiliary hoists.	A report exists and concludes that the FHM main and auxiliary hoists are single-failure-proof in accordance with the approved design. The FHM main and auxiliary hoists are single-failure-proof.
Table 3.4-1	Fuel Handling Equipment System ITAAC	2	The FHM main hoist is capable of lifting and supporting its rated load, holding the rated load, and transporting the rated load.	A rated load test will be performed of the FHM main hoist.	The FHM main hoist lifts, supports, holds with the brakes, and transports a load of at least 125 percent of the manufacturer's rated capacity.
Table 3.4-1	Fuel Handling Equipment System ITAAC	3	The FHM auxiliary hoist is capable of lifting and supporting its rated load, holding the rated load, and transporting the rated load.	A rated load test will be performed of the FHM auxiliary hoist.	The FHM auxiliary hoist lifts, supports, holds with the brakes, and transports a load of at least 125 percent of the manufacturer's rated capacity.
Table 3.4-1	Fuel Handling Equipment System ITAAC	4	Single-failure-proofThe FHM welds are inspectedcomply with the American Society of Mechanical Engineers NOG-1 Code.	An inspection will be performed of the as-built FHM welds.	The results of the non-destructive examination of the FHM welds comply with American Society of Mechanical Engineers NOG-1 Code.
Table 3.4-1	Fuel Handling Equipment System ITAAC	5	The FHM travel is limited to maintain a water inventory for personnel shielding with the pool level at the lower limit of the normal operating low water level.	A test will be performed of the FHM gripper mast limit switches.	The FHM maintains at least 10 feet of water above the top of the fuel assembly when lifted to its maximum height with the pool level at the lower limit of the normal operating low water level.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.4-1	Fuel Handling Equipment System ITAAC	6	The new fuel jib crane hook movement is limited to prevent carrying a fuel assembly over the fuel storage racks in the spent fuel pool.	A test will be performed of new fuel jib crane interlocks.	The new fuel jib crane interlocks prevent the crane from carrying a fuel assembly over the spent fuel racks.
Table 3.5-1	Fuel Storage System ITAAC	1	The fuel storage system ASME Code Class NF components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the fuel storage system ASME Code Class NF as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the fuel storage system ASME Code Class NF fuel storage racks exist and conclude that the requirements of ASME Code Section III are met.
Table 3.5-1	Fuel Storage System ITAAC	2	The fuel storage racks maintain an effective neutron multiplication factor (k-effective) within the following limits at a 95 percent probability, 95 percent confidence level when loaded with fuel of the maximum reactivity to assure subcriticality during plant life, including normal operations and postulated accident conditions: • ~~If credit for soluble boron is taken,~~ k-effective must not exceed 0.95 if flooded with borated water, and k-effective must not exceed 1.0 if flooded with unborated water.	An inspection will be performed of the as-built fuel storage racks, their configuration in the SFP, and the associated documentation.	The as-built fuel storage racks, including any neutron absorbers, and their configuration within the SFP conform to the design values for materials and dimensions and their tolerances, as shown to be acceptable in the ~~approved~~ fuel storage criticality analysis described in the UFSAR.
Table 3.6-2	Ultimate Heat Sink Piping System ITAAC	1	The ultimate heat sink ASME Code Class 3 piping system listed in Table 3.6-1 complies with ASME Code Section III requirements.	An inspection will be performed of the ultimate heat sink ASME Code Class 3 as-built piping system Design Report required by ASME Code Section III.	The ASME Code Section III Design Report (NCA-3550) exists and concludes that the ultimate heat sink ASME Code Class 3 as-built piping system meets the requirements of ASME Code Section III.
Table 3.6-2	Ultimate Heat Sink Piping System ITAAC	2 (Added in 4/4/19 letter)	The UHS Code Class 3 components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the UHS ASME Code Class 3 as-built component Data Report required by ASME Code Section III.	The ASME Code Section III Data Report for the UHS ASME Code Class 3 components listed in Table 3.6-1 and interconnecting piping exists and concludes that the requirements of ASME Code Section III are met.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.6-2	Ultimate Heat Sink Piping System ITAAC	2	The spent fuel pool, refueling pool, reactor pool, and dry dock piping and connections are located to prevent the drain down of the SFP and reactor pool water level below the minimum safety water level.	An inspection will be performed of the as-built SFP, RFP, reactor pool and dry dock piping and connections.	There are no gates, openings, drains, or piping within the SFP, RFP, reactor pool, and dry dock that are below 80 ft building elevation (55 ft pool level) as measured from the bottom of the SFP and reactor pool.
Table 3.7-1	Fire Protection System ITAAC	1	Two separate firewater storage tanks provide a dedicated volume of water for firefighting.	An inspection will be performed of the as-built firewater storage tanks.	Each firewater storage tank provides a usable water volume dedicated for firefighting that is greater than or equal to 300,000 gallons.
Table 3.7-1	Fire Protection System ITAAC	2	The FPS has a sufficient number of fire pumps to provide the ~~design flow requirements to satisfy the~~ flow demand for the largest sprinkler or deluge system plus an additional 500 gpm for fire hoses assuming failure of the largest fire pump or loss of off-site power.	~~i.~~ A~~n~~ test and analysis will be performed of the as-built fire pumps. ~~ii. A test will be performed of the fire pumps.~~	~~i.~~ A report exists and concludes that the fire pumps can provide the flow demand for the largest sprinkler or deluge system plus an additional 500 gpm for fire hoses assuming failure of the largest fire pump or loss of off-site power. ~~ii. Each fire pump delivers the design flow to the FPS, while operating in the fire-fighting alignment.~~

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.7-1	Fire Protection System ITAAC	3	Safe-shutdown can be achieved assuming that all equipment in any one fire area (except for the MCR and under the bioshield) is rendered inoperable by fire damage and that reentry into the fire area for repairs and operator actions is not possible. An alternative shutdown capability that is physically and electrically independent of the MCR exists. Additionally, smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions.	A safe-shutdown analysis of the as- built plant will be performed, including a post-fire safe-shutdown circuit analysis.	A safe-shutdown analysis report exists and concludes that: • Safe-shutdown can be achieved assuming that all equipment in any one fire area (except for the MCR and under the bioshield) is rendered inoperable by fire and that reentry into the fire area for repairs and operator actions is not possible • Smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions. • ~~An independent alternative shutdown capability that is~~ MPS equipment rooms within the reactor building that are used as the alternative shutdown capability are physically and electrically independent of the MCR. ~~exists.~~
Table 3.7-1	Fire Protection System ITAAC	4	A plant FHA considers potential fire hazards and ensures the fire protection features in each fire area are suitable for the hazards.	A FHA of the as-built plant will be performed.	A FHA report exists and concludes that: • Combustible loads and ignition sources are accounted for, and • Fire protection features are suitable for the hazards they are intended to protect against.
Table 3.8-1	Plant Lighting System ITAAC	1	The PLS provides normal illumination of the operator workstations and auxiliary panels in the MCR and operator workstations in the RSS.	i. A test will be performed of the MCR operator workstations and auxiliary panel illumination. ii. A test will be performed of the RSS operator workstations illumination.	i. The PLS provides at least 100 foot-candles illumination at the MCR operator workstations and at least 50 foot-candles at the auxiliary panels. ii. The PLS provides at least 100 foot- candles illumination at the RSS operator workstations.
Table 3.8-1	Plant Lighting System ITAAC	2	The PLS provides emergency illumination of the operator workstations and auxiliary panels in the MCR and operator workstations in the RSS.	i. A test will be performed of the MCR operator workstations and auxiliary panel illumination. ii. A test will be performed of the RSS operator workstations illumination.	i. The PLS provides at least 10 foot- candles of illumination at the MCR operator workstations and auxiliary panels when it is the only MCR lighting system in operation. ii. The PLS provides at least 10 foot- candles at the RSS operator workstations when it is the only RSS lighting system in operation.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.8-1	Plant Lighting System ITAAC	3	Eight-hour battery-pack emergency lighting fixtures provide illumination for post-FSSD activities performed by operators outside the MCR and RSS where post-FSSD activities are performed.	A test will be performed of the eight- hour battery-pack emergency lighting fixtures.	Eight-hour battery-pack emergency lighting fixtures illuminate their required target areas to provide at least one foot-candle illumination in the areas outside the MCR or RSS where post-FSSD activities are performed.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	1	The CRVS automatically responds to a high-radiation signal from 00-CRV-RT-0503, 00-CRV-RT-0504, and 00-CRV-RT-0505 to mitigate a release of radioactivity.	A test will be performed of the CRVS high-radiation signals.	Upon initiation of a real or simulated CRVS high-radiation signals listed in Table 3.9-1, the CRVS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	2	The CRVS and the CRHS automatically respond to a high-radiation signal from 00-CRV-RT-0510 and 00-CRV-RT-0511 to mitigate a release of radioactivity.	A test will be performed of the CRVS high-radiation signals.	Upon initiation of a real or simulated CRVS high-radiation signals listed in Table 3.9-1, the CRVS and the CRHS automatically align/actuate the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	3	The RBVS automatically responds to a high-radiation signal from 00-RBV-RE-0510, 00-RBV-RE-0511, and 00-RBV-RE-0512 to mitigate a release of radioactivity.	A test will be performed of the RBVS high-radiation signals.	Upon initiation of a real or simulated RBVS high-radiation signals listed in Table 3.9-1, the RBVS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	4	The GRWS automatically responds to ~~a~~ high-radiation signal<u>s</u> from 00-GRW- RIT-0046<u>, 00-GRW- RIT-0060, and 00-GRW- RIT-0071</u> to mitigate a release of radioactivity.	A test will be performed of the GRWS high-radiation signals.	Upon initiation of a real or simulated GRWS high-radiation signals listed in Table 3.9-1, the GRWS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	~~5~~	~~The GRWS automatically responds to a high-radiation signal from 00-GRW- RIT-0060 to mitigate a release of radioactivity.~~	~~A test will be performed of the GRWS high-radiation signals.~~	~~Upon initiation of a real or simulated GRWS high-radiation signals listed in Table 3.9-1, the GRWS automatically aligns/actuates the identified components to the positions identified in the table.~~

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	~~6~~	~~The GRWS automatically responds to a high-radiation signal from 00-GRW- RIT-0071 to mitigate a release of radioactivity.~~	~~A test will be performed of the GRWS high-radiation signals.~~	~~Upon initiation of a real or simulated GRWS high-radiation signals listed in Table 3.9-1, the GRWS automatically aligns/actuates the identified components to the positions identified in the table.~~
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	7	The LRWS automatically responds to a high-radiation signal from 00-LRW-RIT-0569 and 00-LRW-RIT-0571 to mitigate a release of radioactivity.	A test will be performed of the LRWS high-radiation signals.	Upon initiation of a real or simulated LRWS high-radiation signals listed in Table 3.9-1, the LRWS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	8	The ABS automatically responds to ~~a~~ high-radiation signals from 00-AB-RT- 0153 and 00-AB-RT- 0166- to mitigate a release of radioactivity.	A test will be performed of the ABS high-radiation signals.	Upon initiation of a real or simulated ABS high-radiation signal listed in Table 3.9-1, the ABS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	~~9~~	~~The ABS automatically responds to a high-radiation signal from 00-AB-RT- 0166 to mitigate a release of radioactivity.~~	~~A test will be performed of the ABS high-radiation signal.~~	~~Upon initiation of a real or simulated ABS high-radiation signal listed in Table 3.9-1, the ABS automatically aligns/actuates the identified components to the positions identified in the table.~~
Table 3.9-2	Radiation Monitoring - NuScale Power Modules 1-12 ITAAC	10	The PSCS automatically responds to a high-radiation signal from 00-PSC-RE-1003 to mitigate a release of radioactivity.	A test will be performed of the PSCS high-radiation signal.	Upon initiation of a real or simulated PSCS high-radiation signal listed in Table 3.9-1, the PSCS automatically aligns/actuates the identified components to the positions identified in the table.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.10-1	Reactor Building Crane ITAAC	1	~~The single-failure-proof RBC main hoist is constructed to provide assurance that a failure of a single hoist mechanism does not result in the uncontrolled movement of the lifted load.~~ The RBC main hoist is single-failure-proof in accordance with the approved design.	An inspection will be performed of the as-built RBC main hoist..	~~The RBC main hoist is single-failure-proof.~~A report exists and concludes that the RBC main hoist is single-failure-proof in accordance with the approved design.
Table 3.10-1	Reactor Building Crane ITAAC	2	~~The single-failure-proof RBC auxiliary hoists are constructed to provide assurance that a failure of a single hoist mechanism does not result in the uncontrolled movement of the lifted load.~~The RBC auxiliary hoists are single-failure-proof in accordance with the approved design.	An inspection will be performed of the as-built RBC auxiliary hoists.	~~The RBC auxiliary hoists are single- failure-proof.~~A report exists and concludes that the RBC auxiliary hoists are single-failure-proof in accordance with the approved design.
Table 3.10-1	Reactor Building Crane ITAAC	3	~~The single-failure-proof RBC wet hoist is constructed to provide assurance that a failure of a single hoist mechanism does not result in the uncontrolled movement of the lifted load.~~The RBC wet hoist is single-failure-proof in accordance with the approved design.	An inspection will be performed of the as-built RBC wet hoist.	~~The RBC wet hoist is single-failure- proof.~~A report exists and concludes that the RBC wet hoist is single-failure-proof in accordance with the approved design.
Table 3.10-1	Reactor Building Crane ITAAC	4	The RBC main hoist is capable of lifting and supporting its rated load, holding the rated load, and transporting the rated load.	A rated load test will be performed of the RBC main hoist.	The RBC main hoist lifts, supports, holds with the brakes, and transports a load of at least 125 ~~to 130~~ percent of the manufacturer's rated capacity.
Table 3.10-1	Reactor Building Crane ITAAC	5	The RBC auxiliary hoists are capable of lifting and supporting their rated load, holding the rated load, and transporting the rated load.	A rated load test will be performed of the RBC auxiliary hoists.	The RBC auxiliary hoists lift, support, hold with the brakes, and transport a load of at least 125 ~~to 130~~ percent of the manufacturer's rated capacity.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.10-1	Reactor Building Crane ITAAC	6	The RBC wet hoist is capable of lifting and supporting its rated load, holding the rated load, and transporting the rated load.	A rated load test will be performed of the RBC wet hoist.	The RBC wet hoist lifts, supports, holds with the brakes, and transports a load of at least 125 ~~to 130~~ percent of the manufacturer's rated capacity.
Table 3.10-1	Reactor Building Crane ITAAC	7	~~Load path RBC welds are inspected.~~All RBC weld joints whose failure could result in the drop of a critical load comply with the American Society of Mechanical Engineers NOG-1 Code.	An inspection will be performed of the as-built RBC weld joints whose failure could result in the drop of a critical load.	The results of the non-destructive examination of the RBC weld joints whose failure could result in the drop of a critical load~~welds~~ comply with American Society of Mechanical Engineers NOG-1 Code.
Table 3.10-1	Reactor Building Crane ITAAC	~~8~~	~~Load path RBC wet hoist welds are inspected.~~	~~An inspection will be performed of the as-built RBC wet hoist.~~	~~The results of the non-destructive examination of the RBC wet hoist welds comply with American Society of Mechanical Engineers NOG-1 Code.~~
Table 3.10-1	Reactor Building Crane ITAAC	9 (RAI 9571, added this)	The MLA is capable of supporting its rated load.	i. A rated load test will be performed of the MLA single load path elements. ii. A rated load test will be performed of the MLA dual load path elements.	i. The MLA single load path elements support a load of at least 300 ~~to 305~~ percent of the manufacturer's rated capacity. ii. The MLA dual load path elements support a load of at least 150 ~~to 155~~ percent of the manufacturer's rated capacity.
Table 3.10-1	Reactor Building Crane ITAAC	10 (RAI 9571, added this)	~~The single-failure-proof MLA is constructed to provide assurance that it will not fail in a manner that results in the uncontrolled movement of the lifted load.~~The MLA is single-failure-proof in accordance with the approved design.	An inspection will be performed of the as-built MLA.	~~The MLA is single-failure-proof.~~A report exists and concludes that the MLA is single-failure-proof in accordance with the approved design.
Table 3.11-2	Reactor Building ITAAC	1	Fire and smoke barriers provide confinement so that the impact from internal fires, smoke, hot gases,or fire suppressants is contained within the RXB fire area of origin.	An inspection will be performed of the RXB as-built fire and smoke barriers.	The following RXB fire and smoke barriers exist in accordance with the fire hazards analysis, and have been qualified for the fire rating specified in the fire hazards analysis: • fire-rated doors • fire-rated penetration seals • fire-rated dampers • fire-rated walls, floors, and ceilings • smoke barriers

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.11-2	Reactor Building ITAAC	2	Internal flooding barriers provide confinement so that the impact from internal flooding is contained within the RXB flooding area of origin.	An inspection will be performed of the RXB as-built internal flooding barriers.	The following RXB internal flooding barriers exist in accordance with the internal flooding analysis report and have been qualified as specified in the internal flooding analysis report: • flood resistant doors • curbs and sills • walls • water tight penetration seals • National Electrical Manufacturer's Association enclosures
Table 3.11-2	Reactor Building ITAAC	3	The Seismic Category I RXB is protected against external flooding in order to prevent flooding of safety- related SSC within the structure.	An inspection will be performed of the RXB as-built floor elevation at ground entrances.	The RXB floor elevation at ground entrances is higher than the maximum external flood elevation.
Table 3.11-2	Reactor Building ITAAC	4	The RXB includes radiation shielding barriers for normal operation and post-accident radiation shielding.	An inspection will be performed of the as-built RXB radiation shielding barriers.	The thickness of RXB radiation shielding barriers is greater than or equal to the required thickness specified in Table 3.11-1.
Table 3.11-2	Reactor Building ITAAC	5	The RXB includes radiation attenuating doors for normal operation and for post-accident radiation shielding. These doors have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed.	An inspection will be performed of the as-built RXB radiation attenuating doors.	The RXB radiation attenuating doors are installed in their design location and have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed~~, in accordance with the approved door schedule design~~.
Table 3.11-2	Reactor Building ITAAC	6	The RXB is Seismic Category I and maintains its structural integrity under the design basis loads.	i. An inspection and analysis will be performed of the as-built RXB. ii. An inspection will be performed of the as-built RXB.	i. A design report exists and concludes that the deviations between the drawings used for construction and the as-built RXB have been reconciled, and the RXB maintains its structural integrity under the design basis loads. ii. The dimensions of the RXB critical sections conform to the approved design.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.11-2	Reactor Building ITAAC	7	Non-Seismic Category I SSC located where there is a potential for adverse interaction with a the RXB or a Seismic Category I SSC exists in the RXB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following a SSE.	An inspection and analysis will be performed of the as-built non-Seismic Category I SSC located where there is a potential for adverse interaction with the RXB or a Seismic Category I SSC in the RXB. in the RXB.	A report exists and concludes that the Non-Seismic Category I SSC located where there is a potential for adverse interaction with the RXB or a Seismic Category I SSC exists in the RXB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following an SSE as demonstrated by one or more of the following criteria: • Seismic Category I SSC are isolated from non-Seismic Category I SSC, so that interaction does not occur. • Seismic Category I SSC are analyzed to confirm that the ability to perform their safety functions is not impaired as a result of impact from non- Seismic Category I SSC. • A non-Seismic Category I restraint system designed to Seismic Category I requirements is used to assure that no interaction occurs between Seismic Category I SSC and non-Seismic Category I SSC.
Table 3.11-2	Reactor Building ITAAC	8	Safety-related SSC are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	An inspection and analysis will be performed of the as-built high- and moderate-energy piping systems and protective features for the safety- related SSC located in the RXB outside the Reactor Pool Bay.	Protective features are installed in accordance with the as-built Pipe Break Hazard Analysis Report and safety-related SSC are protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.
Table 3.12-2	Radioactive Waste Building ITAAC	1	The RWB includes radiation shielding barriers for normal operation and post-accident radiation shielding.	An inspection will be performed of the as-built RWB radiation shielding barriers.	The thickness of RWB radiation shielding barriers is greater than or equal to the required thickness specified in Table 3.12-1.
Table 3.12-2	Radioactive Waste Building ITAAC	2	The RWB includes radiation attenuating doors for normal operation and for post-accident radiation shielding. These doors have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed.	An inspection will be performed of the as-built RWB radiation attenuating doors.	The RWB radiation attenuating doors are installed in their design location and have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed. in accordance with the approved door schedule design.
Table 3.12-2	Radioactive Waste Building ITAAC	3	The RWB is an RW-IIa structure and maintains its structural integrity under the design basis loads.	An inspection and analysis will be performed of the as-built RW-IIa RWB.	A design report exists and concludes that the deviations between the drawings used for construction and the as-built RW-IIa RWB have been reconciled and that the as-built RW-IIa RWB maintains its structural integrity under the design basis loads.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.13-1	Control Building ITAAC	1	Fire and smoke barriers provide confinement so that the impact from internal fires, smoke, hot gases, or fire suppressants is contained within the CRB fire area of origin.	An inspection will be performed of the CRB as-built fire and smoke barriers.	The following CRB fire and smoke barriers exist in accordance with the fire hazards analysis, and have been qualified for the fire rating specified in the fire hazards analysis: • fire-rated doors • fire-rated penetration seals • fire-rated dampers • fire-rated walls, floors, and ceilings • smoke barriers
Table 3.13-1	Control Building ITAAC	2	Internal flooding barriers provide confinement so that the impact from internal flooding is contained within the CRB flooding area of origin.	An inspection will be performed of the CRB as-built internal flooding barriers.	The following CRB internal flooding barriers exist in accordance with the internal flooding analysis report and have been qualified as specified in the internal flooding analysis report: • flood resistant doors • walls • water tight penetration seals • National Electrical Manufacturer's Association (NEMA) enclosures
Table 3.13-1	Control Building ITAAC	3	The Seismic Category I CRB is protected against external flooding in order to prevent flooding of safety- related SSC within the structure.	An inspection will be performed of the CRB as-built floor elevation at ground entrances.	The CRB floor elevation at ground entrances is higher than the maximum external flood elevation.
Table 3.13-1	Control Building ITAAC	4	The CRB at Elevation 120’-0” (except for the elevator shaft, the stairwells, and the fire protection vestibule which are Seismic Category II) and below is Seismic Category I and maintains its structural integrity under the design basis loads.	i. An inspection and analysis will be performed of the as-built CRB. ii. An inspection will be performed of the as-built CRB at Elevation 120’- 0” and below.	i. A design report exists and concludes that the deviations between the drawings used for construction and the as-built CRB have been reconciled, and the CRB at Elevation 120’-0” and below (except for the elevator shaft, the stairwells, and the fire protection vestibule) maintains its structural integrity under the design basis loads. ii. The dimensions of the CRB critical sections conform to the approved design.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.13-1	Control Building ITAAC	5	Non-Seismic Category I SSC located where a potential for adverse interaction with a Seismic Category I SSC exists in the CRB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following a safe shutdown earthquake.	An inspection and analysis will be performed of the as-built non-Seismic Category I SSC in the CRB.	A report exists and concludes that the Non-Seismic Category I SSC located where a potential for adverse interaction with a Seismic Category I SSC exists in the CRB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following a safe-shutdown earthquake as demonstrated by one or more of the following criteria: • The collapse of the non-seismic Category I structure to strike a seismic Category I SSC. • The collapse of the non-Category I structure will not impair the integrity of Seismic Category I SSCs, nor result in incapacitating injury to control room occupants, • The non-Category I structure will be analyzed and designed to prevent its failure under SSE conditions.
Table 3.14-2	Equipment Qualification - Shared Equipment ITAAC	1	The common Seismic Category I equipment listed in Table 3.14-1, including its associated supports and anchorages, withstands design basis seismic loads without loss of its function(s) during and after a safe shutdown earthquake. The scope of equipment for this design commitment is common, safety- related equipment, and common, nonsafety-related equipment that provides one of the following nonsafety-related functions: • Provides physical support of irradiated fuel (fuel handling machine, spent fuel storage racks, reactor building crane, and module lifting adaptor) • Provides a path for makeup water to the UHS • Provides containment of UHS water • Monitors UHS water level	i. A type test, analysis, or a combination of type test and analysis will be performed of the common Seismic Category I equipment, including its associated supports and anchorages. ii. An inspection will be performed of the common Seismic Category I as- built equipment, including its associated supports and anchorages.	i. A ~~s~~Seismic ~~q~~Qualification Report ~~record form~~ exists and concludes that the common Seismic Category I equipment listed in Table 3.14-1, including its associated supports and anchorages, will withstand the design basis seismic loads and perform its function during and after a safe shutdown earthquake. ii. The common Seismic Category I equipment listed in Table 3.14-1, including its associated supports and anchorages, is installed in its design location in a Seismic Category I structure in a configuration bounded by the equipment's seismic qualification record form.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.14-2	Equipment Qualification - Shared Equipment ITAAC	2	The common electrical equipment located in a harsh environment, including its connection assemblies, withstands the design basis harsh environmental conditions experienced during normal operations, anticipated operational occurrences, DBA, and post-accident conditions and performs its function for the period of time required to complete the function. The scope of equipment for this design commitment is nonsafety-related equipment that provides monitoring of the UHS water level and the non-safety related electrical equipment on the fuel handling machine and reactor building crane used to physically support irradiated fuel.	i. A type test or a combination of type test and analysis will be performed of the common electrical equipment, including its connection assemblies. ii. An inspection will be performed of the common as-built electrical equipment, including its connection assemblies.	i. An equipment qualification record form exists and concludes that the common electrical equipment listed in Table 3.14-1, including its connection assemblies, performs its function under the environmental conditions specified in the equipment qualification record form for the period of time required to complete the function. ii. The common electrical equipment listed in Table 3.14-1, including its connection assemblies, is installed in its design location in a configuration bounded by the EQ record form.
Table 3.14-2	Equipment Qualification - Shared Equipment ITAAC	3 (Response to RAI 9608 added this ITAAC)	The RW-IIa components and piping ~~used for processing gaseous radioactive waste~~ listed in Table 3.14-1 are constructed to the standards of RW-IIa.	i. An inspection and reconciliation analysis will be performed of the as-built RW-IIa components and piping listed in Table 3.14-1. ~~used for processing gaseous radioactive waste.~~	i. A report exists and concludes that the as-built RW-IIa components and piping ~~used for processing gaseous radioactive waste~~ listed in Table 3.14-1 meet the RW-IIa design criteria.
Table 3.15-1	Human Factors Engineering ITAAC	1	The as-built main control room HSI is consistent with the final design specifications validated by the integrated system validation test.	An inspection will be performed of the as-built configuration of MCR HSI.	The as-built configuration of main control room HSI is consistent with the as-designed configuration of main control room HSI as modified by the Integrated System Validation Report.
Table 3.16-1	Physical Security System ITAAC	1	Vital equipment will be located only within a vital area.	All vital equipment locations will be inspected.	Vital equipment is located only within a vital area.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.16-1	Physical Security System ITAAC	2	Access to vital equipment requires passage through at least two physical barriers.	All vital equipment physical barriers will be inspected.	Vital equipment is located within a protected area such that access to the vital equipment requires passage through at least two physical barriers.
Table 3.16-1	Physical Security System ITAAC	3	The external walls, doors, ceiling, and floors in the MCR and CAS will be bullet-resistant.	Type test, analysis, or a combination of type test and analysis of the external walls, doors, ceiling, and floors in the MCR and CAS, will be performed.	A report exists and concludes that the walls, doors, ceilings, and floors in the MCR and CAS are bullet-resistant.
Table 3.16-1	Physical Security System ITAAC	4	An access control system will be installed and designed for use by individuals who are authorized access to vital areas within the nuclear island and structures without escort.	The access control system will be tested.	The access control system is installed and provides authorized access to vital areas within the nuclear island and structures only to those individuals with authorization for unescorted access.
Table 3.16-1	Physical Security System ITAAC	5	Unoccupied vital areas within the nuclear island and structures will be designed with locking devices and intrusion detection devices that annunciate in the CAS.	Tests, inspections, or a combination of tests and inspections of unoccupied vital areas' intrusion detection equipment and locking devices will be performed.	Unoccupied vital areas within the nuclear island and structures are locked and alarmed and intrusion is detected and annunciated in the CAS.
Table 3.16-1	Physical Security System ITAAC	6	The CAS will be located inside the protected area and will be designed so that the interior is not visible from the perimeter of the protected area.	The CAS will be inspected.	The CAS is located inside the protected area, and the interior of the alarm station is not visible from the perimeter of the protected area.
Table 3.16-1	Physical Security System ITAAC	7	Security alarm devices in the RXB and CRB, including transmission lines to annunciators, will be tamper-indicating and self- checking, and alarm annunciation indicates the type of alarm and its location.	All security alarm devices and transmission lines in the RXB and CRB will be tested.	Security alarm devices in the RXB and CRB, ~~within the nuclear island and structures~~ including transmission lines to annunciators, are tamper-indicating and self-checking; an automatic indication is provided when failure of the alarm system or a component thereof occurs or when the system is on standby power; the alarm annunciation indicates the type of alarm and location.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.16-1	Physical Security System ITAAC	8	Intrusion detection and assessment systems in the RXB and CRB ~~within the nuclear island and structures~~ will be designed to provide visual display and audible annunciation of alarms in the CAS.	Intrusion detection and assessment systems in the RXB and CRB will be tested.	The intrusion detection systems in the RXB and CRB~~, within the nuclear island and structures~~ provide a visual display and audible annunciation of all alarms in the CAS.
Table 3.16-1	Physical Security System ITAAC	9	Intrusion detection systems' recording equipment will record security alarm annunciations within the nuclear island and structures including each alarm, false alarm, alarm check, and tamper indication, and the type of alarm, location, alarm circuit, date, and time.	The intrusion detection systems' recording equipment ~~in the RXB and CRB~~ will be tested.	Intrusion detection systems' recording equipment is capable of recording each security alarm annunciation within the nuclear island and structures, including each alarm, false alarm, alarm check, and tamper indication and the type of alarm, location, alarm circuit, date, and time.
Table 3.16-1	Physical Security System ITAAC	10	Emergency exits through the vital area boundaries within the nuclear island and structures will be alarmed with intrusion detection devices and ~~within the nuclear island and structures~~ are secured by locking devices that allow prompt egress during an emergency.	Tests, inspections, or a combination of tests and inspections of emergency exits through vital area boundaries within the nuclear island and structures will be performed.	Emergency exits through the vital area boundaries within the nuclear island and structures are alarmed with intrusion detection devices and secured by locking devices that allow prompt egress during an emergency.
Table 3.16-1	Physical Security System ITAAC	11	The CAS will have a landline telephone service with the control room and local law enforcement authorities.	Tests, inspections, or a combination of tests and inspections of the CAS's landline telephone service will be performed.	The CAS is equipped with landline telephone service with the control room and local law enforcement authorities.
Table 3.16-1	Physical Security System ITAAC	12	The CAS will be capable of continuous communication with on-duty security force personnel.	Tests, inspections, or a combination of tests and inspections of the CAS's continuous communication capabilities will be performed.	The CAS is capable of continuous communication with on-duty watchmen, armed security officers, armed responders, or other security personnel who have responsibilities within the physical protection program and during contingency response events.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.16-1	Physical Security System ITAAC	13	Nonportable communications equipment in the CAS will remain operable from an independent power source in the event of the loss of normal power.	Tests, inspections, or a combination of tests and inspections of the nonportable communications equipment will be performed.	All nonportable communication devices in the CAS remain operable from an independent power source in the event of the loss of normal power.
Table 3.17-2	Radiation Monitoring ITAAC for NuScale Power Modules 1-6	1	The CFDS automatically responds to a high-radiation signal from 6A-CFD-RT-1007 to mitigate a release of radioactivity.	A test will be performed of the CFDS high-radiation signal.	Upon initiation of a real or simulated CFDS high-radiation signal listed in Table 3.17-1, the CFDS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.17-2	Radiation Monitoring ITAAC for NuScale Power Modules 1-6	2	The BPDS automatically responds to ~~a~~ high-radiation signals~~-~~ from 6A-BPD-RIT-0552, 6A-BPD-RIT- 0529, and 6A-BPD-RIT- 0705~~-~~ to mitigate a release of radioactivity.	A test will be performed of the BPDS high-radiation signals.	Upon initiation of a real or simulated BPDS high-radiation signal listed in Table 3.17-1 the BPDS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.17-2	Radiation Monitoring ITAAC for NuScale Power Modules 1-6	~~3~~	~~The BPDS automatically responds to a high-radiation signal from 6A-BPD-RIT-0529 to mitigate a release of radioactivity.~~	~~A test will be performed of the BPDS high-radiation signal.~~	~~Upon initiation of a real or simulated BPDS high-radiation signal listed in Table 3.17-1, the BPDS automatically aligns/actuates the identified components to the positions identified in the table.~~
Table 3.17-2	Radiation Monitoring ITAAC for NuScale Power Modules 1-6	4	~~The BPDS automatically responds to a high-radiation signal from 6A-BPD-RIT-0705 to mitigate a release of radioactivity.~~	~~A test will be performed of the BPDS high-radiation signal.~~	~~Upon initiation of a real or simulated BPDS high-radiation signal listed in Table 3.17-1, the BPDS automatically aligns/actuates the identified components to the positions identified in the table.~~
Table 3.18-2	Radiation Monitoring ITAAC For NuScale Power Modules 7-12	1	The CFDS automatically responds to a high-radiation signal from 6B-CFD-RT-1007 to mitigate a release of radioactivity.	A test will be performed of the CFDS high-radiation signal.	Upon initiation of a real or simulated CFDS high-radiation signal listed in Table 3.18-1, the CFDS automatically aligns/actuates the identified components to the positions identified in the table.

Table #	Table Title	No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Table 3.18-2	Radiation Monitoring ITAAC For NuScale Power Modules 7-12	2	The BPDS automatically responds to ~~a~~ high-radiation signals from 6B-BPD-RIT-0551 and 6B-BPD-RIT- 0530 to mitigate a release of radioactivity.	A test will be performed of the BPDS high-radiation signals.	Upon initiation of a real or simulated BPDS high-radiation signal listed in Table 3.18-1, the BPDS automatically aligns/actuates the identified components to the positions identified in the table.
Table 3.18-2	Radiation Monitoring ITAAC For NuScale Power Modules 7-12	~~3~~	~~The BPDS automatically responds to a high-radiation signal from 6B-BPD-RIT-0530 to mitigate a release of radioactivity.~~	~~A test will be performed of the BPDS high-radiation signal.~~	~~Upon initiation of a real or simulated BPDS high-radiation signal listed in Table 3.18-1, the BPDS automatically aligns/actuates the identified components to the positions identified in the table.~~

Request for Additional Information No. 522 (eRAI No. 9681)

Issue Date: 05/21/2019
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 14.03 - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: 14.03

QUESTIONS

14.03-3

14.03.01-1

Please see the attachment to this Request for Additional Information.

Title 10, Section 52.47(b)(1) of the Code of Federal Regulations (CFR) requires that a design certification application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will operate in accordance with the design certification, the provisions of the Atomic Energy Act of 1954, as amended (AEA), and the NRC's rules and regulations. For the ITAAC to be "sufficient," (1) the inspections, tests, and analyses (ITA) must clearly identify those activities necessary to demonstrate that the acceptance criteria (AC) are met; (2) the AC must state clear design or performance objectives demonstrating that the Tier 1 design commitments (DCs) are satisfied; (3) the ITA and AC must be consistent with each other and the Tier 1 DC; (4) the ITAAC must be capable of being performed and satisfied prior to fuel load; and (5) the ITAAC, as a whole, must provide reasonable assurance that, if the ITAAC are satisfied, the facility has been constructed and will be operated in accordance with the design certification, the AEA, and the NRC's rules and regulations.

The staff has reviewed all DCD Rev 2, Tier 1 ITAAC tables and Chapter 1 of Tier 1 against these objectives, and in light of NRC guidance, Commission policy, and lessons learned from plants that are currently under construction that are in the process of implementing ITAAC. Based on this review, the staff has compiled the attached list of proposed ITAAC wording changes. The applicant is requested to make these changes in the Tier 1 ITAAC tables and in Chapter 1 of Tier 1, or otherwise show that the ITAAC comply with 10 CFR 52.47(b)(1). Additionally, the applicant is requested to address the following items, or otherwise show that the ITAAC comply with 10 CFR 52.47(b)(1):

1. ITAAC 29 in Table 2.5-7 verifies that the MCR isolation switches are located in the remote shutdown station but it does not verify the functionality of the switches. Please explain how ITAAC 29 verifies that the MCR isolation switches actually isolate the manual MCR switches from the MPS in case of fire. If ITAAC 29 does not verify the functionality of the MCR isolation switches, please explain what changes to the existing ITAAC in Tier 1 would be necessary to verify the functionality of the MCR isolation switches through ITAAC. If the applicant believes that ITAAC are not necessary to verify the functionality of the MCR isolation switches, please explain this and please explain why an ITAAC is, nonetheless, necessary to verify the location of the MCR isolation switches.

2. The design commitments listed in the design descriptions of DCA Part 2, Tier 1 are not consistent with the design commitments in the corresponding ITAAC tables. Although not identified in the attachment, the design

commitments in the design descriptions of DCA Part 2, Tier 1 should be revised to be consistent with the design commitment in the ITAAC tables.

Additional explanations for the basis of the staff's proposed revisions in the attachment are provided below:

1. Tier 1, Section 1.1: Propose adding a definition of "approved design" to clarify what this term refers to. Without a definition, it is not clear who the approver is or when the design is considered approved (at certification or when the ITAAC is closed?). To provide clarity and flexibility, the staff proposes to define the "approved design" in terms of the updated final safety analysis report.
2. Tier 1, Section 1.2.4: Propose adding explanatory material consistent with past design certifications as applied to the NuScale design.
3. ITAAC 12 in Table 2.1-4: To resolve the use of the ambiguous word, "approximately" in the AC.
4. ITAAC 22 in Table 2.1-4: To clarify the applicability of the ITAAC to the assemblies and to add consideration of overload currents.
5. ITAAC 1 and 2 in Table 2.3-1: To make the scope of the ITA and AC consistent with the DC.
6. ITAAC 3, 4, and 6 in Table 2.5-7: To clarify the applicability of physical separation, electrical isolation, and communications independence in the DC and ITAAC.
7. ITAAC 15 in Table 2.5-7: To clarify the DC and make the DC consistent with the AC.
8. ITAAC 21 in Table 2.5-7: To clarify the DC and resolve an inconsistency between the DC and AC.
9. ITAAC 2, 3, and 4 in Table 2.7-2: The DCs for ITAAC 2 to 4 relate to a single Chemical Volume and Control System (CVCS) high radiation signal, but the AC for each ITAAC cover all 3 CVCS radiation signals. The proposed changes consolidate ITAAC 2 to 4 so that the scope of the DC matches the scope of the AC.
10. ITAAC 1 in Table 3.4-1: To resolve an inconsistency between the DC and AC.
11. ITAAC 4 in Table 3.4-1: The DC is actually an ITA. The staff's proposed revisions correct this.
12. ITAAC 2 in Table 3.5-1: To remove an unnecessary conditional statement in the DC and to clarify what the "approved" analysis is.
13. ITAAC 3 in Table 3.7-1: To clarify in the AC the alternative shutdown capability referred to in the DC.
14. ITAAC 4, 5, and 6 in Table 3.9-2: See explanation for ITAAC 2, 3, and 4 in Table 2.7-2.
15. ITAAC 8 and 9 in Table 3.9-2: See explanation for ITAAC 2, 3, and 4 in Table 2.7-2.
16. ITAAC 1, 2, and 3 in Table 3.10-1: To resolve inconsistencies between the DC and AC.
17. ITAAC 7 in Table 3.10-1: The DC is actually an ITA. The staff's proposed revisions correct this and make it consistent with the AC.
18. ITAAC 8 in Table 3.10-1: This ITAAC could be deleted if the proposed revisions to ITAAC 7 in Table 3.10-1 are incorporated as shown in the attachment since the scope of the revised ITAAC 7 would encompass the scope of ITAAC 8.
19. ITAAC 10 in Table 3.10-1: To resolve inconsistencies between the DC and AC.
20. ITAAC 5 in Table 3.11-2: To remove unnecessary and ambiguous qualifying language in the AC.
21. ITAAC 2 in Table 3.12-2: To remove unnecessary and ambiguous qualifying language in the AC.
22. ITAAC 7 and 8 in Table 3.16-1: To make the scope of the ITAAC consistent among the DC, ITA, and AC.
23. ITAAC 9 in Table 3.16-1: To clarify the scope of the ITA.
24. ITAAC 10 in Table 3.16-1: To make the scope of the ITA and AC consistent with the DC.

25. ITAAC 2, 3, and 4 in Table 3.17-2: See explanation for ITAAC 2, 3, and 4 in Table 2.7-2.

26. ITAAC 2 and 3 in Table 3.18-2: See explanation for ITAAC 2, 3, and 4 in Table 2.7-2.