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July 13, 2016

Docket: PROJ0769

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Submittal of Additional Meeting Material for Use During Public Meeting on July 20, 2016 (NRC Project No. 0769)

NuScale Power, LLC (NuScale) has requested a public meeting with the NRC staff on July 20, 2016, to discuss Inspections, Tests, Analysis and Acceptance Criteria (ITAAC.) The purpose of this submittal is to provide additional presentation material prepared for use during this meeting in conjunction with the presentation material that was submitted to the NRC on July 7, 2016. Attachment 1: *NRC-Proposed ITAAC Not Applicable to NuScale Design (58 ITAAC)* and Attachment 2: *Comments on NuScale Letter Enclosure from NRC* have been prepared for use during this meeting. These two attachments have been determined to be nonproprietary.

This correspondence includes preliminary and/or conceptual information, which reflects the current stage of the NuScale design and may be subject to change. This letter and its enclosures make no regulatory commitments and no revisions to any existing regulatory commitments.

Please feel free to contact me at 301-770-0472 or at smirsky@nuscalepower.com if you have any questions.

Sincerely,

A handwritten signature in black ink that reads 'Steve Mirsky'.

Steve Mirsky
Manager, Regulatory Affairs
NuScale Power, LLC

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Attachment 1: "NRC-Proposed ITAAC Not Applicable to NuScale Design (58 ITAAC)," Revision 0, nonproprietary version

Attachment 2: "Comments on NuScale Letter Enclosure from NRC," Revision 0, nonproprietary version

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ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
A01	ASME	Reactor Coolant Pressure Boundary (RCPB)	Design Acceptance Criteria ASME Code Section III Piping System Design Report (As-Designed) {{DAC}} (If DAC use approved)	The [XXX system] ASME Code Class [1, 2 and/or 3] as-designed piping system complies with ASME Code Section III requirements	An inspection will be performed of the [XXX system] as-designed ASME Code Class [1, 2 and/or 3] piping system Design Report, required by ASME Code Section III. {{DAC}}	The ASME Code Section III Design Report (NCA-3550) exists and concludes that the [XXX system] ASME Code Class [1, 2 and/or 3] as-designed piping system meets the requirements of ASME Code Section III. {{DAC}}	Not applicable to NuScale design. NuScale does not have any ASME design acceptance criteria (DAC).
A03	ASME	Reactor Coolant Pressure Boundary (RCPB)	As-Built Inspection and Analysis ASME Code Section III Code Class 1, 2, and 3 Piping Systems Functional Capability Report {This ITAAC is for design certifications for which the ASME Code of record is the 1992 Edition with 1994 Addenda through the 2004 Edition with 2005 Addenda.}	The [XXX system] ASME Code Class [1, 2, and/or 3] piping systems are designed to withstand Level D condition loads without a loss of functional capability.	An inspection and analysis will be performed of the [XXX system] as-built piping systems.	A report exists and concludes that each of the as-built lines listed in [Table x.x.x-x] maintains functional capability in Level D conditions.	Not applicable to NuScale design. NuScale does not have any ASME piping whose ASME Code of record is the 1992 Edition with 1994 Addenda through the 2004 Edition with 2005 Addenda.
A06	ASME	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	Design Acceptance Criteria Pipe Break Hazards Analysis Report (As-Designed) {{DAC}} (If DAC use approved)	Safety-related SSCs are protected against the dynamic and environmental effects associated with postulated failures in high-and moderate-energy piping systems. Note: Protection against dynamic effects is not required for high-energy, ASME Code Section III Class 1 and 2 piping and interconnected equipment nozzles for which LBB criteria is considered applicable.	A pipe break hazards analysis will be performed to evaluate the effects of postulated failures of high-and moderate-energy piping systems on nearby safety-related SSCs. {{DAC}}	A Pipe Break Hazards Analysis Report exists and concludes that the as-designed safety-related SSCs will be protected against: • The dynamic effects associated with postulated failures in high-energy piping systems. • The environmental effects associated with postulated failures in high-and moderate-energy piping systems. {{DAC}}	Not applicable to NuScale design. NuScale does not have any Pipe Break Analysis Report design acceptance criteria (DAC).
C01	Containment	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	As-Built Inspection Containment Combustible Gas Control	The [XXX system] controls the combustible gas concentration in the [primary reactor containment].	An inspection will be performed of the [XXX system] as-built [hydrogen igniters and/or passive autocatalytic recombiners].	The [XXX system] [hydrogen igniters and/or passive autocatalytic recombiners] identified in [Table x.x.x-x] are: • located in the [primary reactor containment as shown on [Figure x.x.x-x], and • conform to the requirements of the approved Hydrogen Combustion Analysis.	Not applicable to NuScale design. NuScale design does not have this design feature of hydrogen igniters and/or passive autocatalytic recombiners.
C03	Containment	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	Preoperational Test Containment Combustible Gas Control - Containment Hydrogen Igniters (Use this ITAAC if hydrogen igniters are used in the design.)	The [XXX system] controls the combustible gas concentration in the [primary reactor containment].	A test will be performed of the [XXX system] hydrogen igniters.	The surface temperature of each hydrogen igniter listed in [Table x.x.x-x] is equal to or greater than [XXX °F] when energized.	Not applicable to NuScale design. NuScale design does not have this design feature of hydrogen igniters and/or passive autocatalytic recombiners.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
E01	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Electrical Divisional Power Verification	The [XXX system] Class 1E equipment is powered from its respective Class 1E division.	A test will be performed of the [XXX system] Class 1E equipment.	The [XXX system] Class 1E equipment listed in [Table x.x.x-x] is powered from the Class 1E division listed in [Table x.x.x-x].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E02	Electrical	As-Built Inspection Class 1E Power Circuits Physical Separation	As-Built Inspection Class 1E Power Circuits Physical Separation	Physical separation exists between the redundant divisions of the [XXX system] Class 1E power circuits, and between Class 1E power circuits and non-Class 1E current-carrying circuits.	An inspection will be performed of the [XXX system] Class 1E as-built power circuits.	i. Physical separation between redundant divisions of [XXX system] Class 1E power 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 [XXX system] Class 1E power circuits and non-Class 1E 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.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E03	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection Class 1E Power Circuits Electrical Isolation	Electrical isolation exists between [XXX system] Class 1E power circuits and connected non-Class 1E power circuits to prevent the propagation of credible electrical faults.	i. 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 [XXX system] Class 1E as-built power 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 [XXX system] Class 1E power circuits and connected non-Class 1E power circuits.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E04	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Analysis Class 1E Circuit Interrupting Devices Coordination	The [XXX system] Class 1E circuit interrupting devices provide electrical fault protection coordination to limit the loss of equipment due to postulated fault conditions.	An analysis will be performed of the [XXX system] Class 1E as-built circuit interrupting devices.	The Coordination Study for the [XXX system] Class 1E circuit interrupting devices exists and concludes that the Class 1E circuit-interrupting device closest to a fault opens before other Class 1E circuit interrupting devices.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E06	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Inverter Capacity	The [XXX system] Class 1E inverters are sized to power their design loads.	A test will be performed of the [XXX system] Class 1E inverters.	Each [XXX system] Class 1E inverter listed in [Table x.x.x-x] maintains rated voltage and rated frequency while the inverter supplies the design load [XXX amps].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
E07	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Battery Charger Capacity	The [XXX system] Class 1E battery chargers are sized to power their design loads.	A test will be performed of the [XXX system] Class 1E battery chargers.	Each [XXX system] Class 1E battery charger listed in [Table x.x.x-x] maintains rated voltage while the battery charger supplies the design load [XXX amps].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E08	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Battery Capacity	The [XXX system] Class 1E batteries are sized to power their design loads.	A test will be performed of the [XXX system] Class 1E batteries.	Each [XXX system] Class 1E battery listed in [Table x.x.x-x] maintains terminal voltage greater than rated voltage [#### volts] while not exceeding individual cell limit of [### volts] with a [### Amp/hour] discharge rate for [## hours].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E09	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Emergency Diesel Generator Capacity	The [XXX system] Class 1E emergency diesel generators are capable of supplying their rated loads.	A test will be performed of the [XXX system] Class 1E emergency diesel generators.	Each [XXX system] Class 1E emergency diesel generator listed in [Table x.x.x-x] provides power at the generator terminal rated voltage and frequency when operated at: <ul style="list-style-type: none"> • a load equivalent to the short-time rating of the diesel generator for an interval of [2 hours] or greater, and • a load equivalent of [90-100%] of the continuous rating of the diesel generator for an interval of [22 hours] or greater. 	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
E10	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Emergency Diesel Generator Load Shed and Sequencer Operation	Upon loss of off-site power, the [XXX system] Class 1E emergency diesel generators automatically start and achieve steady-state design voltage and frequency within the required time; the loads are shed from the associated [XXX system] Class 1E bus; and shutdown loads are automatically sequenced onto the Class 1E bus.	A test will be performed of the [XXX system] Class 1E emergency diesel generators and associated Class 1E buses.	Upon a simulated loss of off-site power, the following responses are obtained for each [XXX system] Class 1E emergency diesel generator listed in [Table x.x.x-x]: • The Class 1E emergency diesel generator starts on the auto-start signal from its standby conditions and achieves steady-state generator terminal voltage between [### volts AC] and [### volts AC], and a frequency between [### Hz] and [### Hz] within [### seconds]. • Loads are shed from the associated Class 1E buses. • Shutdown loads are automatically sequenced onto their associated Class 1E bus.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E11	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Emergency Diesel Generator Automatic Start	Upon a safety injection actuation signal, the [XXX system] Class 1E emergency diesel generators automatically start and attain design voltage and frequency within the required time.	A test will be performed of the [XXX system] Class 1E emergency diesel generators.	Upon a simulated safety injection signal, each [XXX system] Class 1E emergency diesel generator listed in [Table x.x.x-x] starts on the auto-start signal from its standby conditions, and attains design voltage and frequency within the required time.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E12	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection Class 1E Emergency Diesel Generator Fuel Oil Storage Tank Capacity	The fuel oil storage tank for each [XXX system] Class 1E emergency diesel generator is sufficient to operate the diesel generator at its 100% continuous rating for 7 days.	An inspection will be performed of the [XXX system] Class 1E as-built emergency diesel generator fuel oil storage tanks.	Each [XXX system] diesel generator fuel oil storage tank listed in [Table x.x.x-x] has a useable volume greater than the volume of fuel oil consumed by its associated [XXX system] Class 1E emergency diesel generator operating at its 100% continuous rating for 7 days.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E13	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Emergency Diesel Generator Fuel Oil Makeup Flow Rate	The [XXX system] Class 1E emergency diesel generator has a sufficient fuel makeup flow rate to allow continuous operation of the diesel generator while the diesel generator is operating at its 100% continuous rating.	A test will be performed of the [XXX system] Class 1E emergency diesel generator fuel oil transfer system.	Each [XXX system] Class 1E emergency diesel generator fuel oil transfer pump listed in [Table x.x.x-x] operating in normal system alignment to the [XXX system] Class 1E emergency diesel generator day tank provides a fuel makeup rate at least equal to the [XXX system] Class 1E emergency diesel generator fuel oil consumption rate while operating at its 100% continuous rating.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E14	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection {Use the following ITAAC if an Alternate AC Source exists} Alternate AC Source is Diverse from Class 1E Emergency Diesel Generator	The electrical and mechanical portions of the alternate AC source are diverse from the electrical and mechanical portions of the Class 1E emergency diesel generators.	An inspection will be performed of the as-built electrical and mechanical portions of the alternate AC source and the Class 1E emergency diesel generators.	The electrical and mechanical portions of the alternate AC source are diverse from the electrical and mechanical portions of the Class 1E emergency diesel generators.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E17	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Control Power Verification	Control power for the [XXX system] Class 1E switchgear and load centers is provided from its respective Class 1E [channel or division].	A test will be performed of the control power for the [XXX system] Class 1E switchgear and load centers.	The control power for the [XXX system] Class 1E switchgear and load centers listed in [Table x.x.x-x] is provided from its respective Class 1E [channel or division].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
E18	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Analysis Class 1E Electrical Equipment Fault Capacity Analysis	The [XXX system] Class 1E [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, and containment electrical penetration assemblies] are rated to withstand fault currents for the time required to clear the fault from its power source.	An analysis will be performed of the [XXX system] as-built Class 1E [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, and containment electrical penetration assemblies].	A circuit interrupting device coordination analysis exists and concludes that the current carrying capability for the [XXX system] Class 1E [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, and containment electrical penetration assemblies] listed in [Table x.x.x-x] is greater than the analyzed fault currents for the time required to clear the fault from its power source.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power. Deleted "as-built" in acceptance criteria.
E19	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Offsite Preferred Power Supply	If the normal preferred offsite power supply is not available, Class 1E [###] voltage buses are automatically transferred to the alternate preferred offsite power supply.	A test will be performed of the Class 1E [###] voltage buses.	The Class 1E [###] voltage buses are automatically transferred to the alternate preferred offsite power supply on loss of the normal preferred offsite power supply.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E20	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E Inverter Power Supply	When DC input power to the Class 1E inverter power supply unit is lost, input power to the Class 1E inverter power supply unit is provided by the regulating transformer without interruption of power to the loads.	A test will be performed of the Class 1E inverters.	When DC input power to the Class 1E inverter power supply unit is lost, input power to the Class 1E inverter power supply unit is provided by the regulating transformer without interruption of power to the loads.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E21	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E EDG Air Start Capacity	The Class 1E EDG [air start system] receiver tanks of each emergency diesel generator (EDG) have a combined air capacity for five starts of the EDG without replenishing air to the receiver tanks.	A test will be performed of the Class 1E EDG [air start system].	Each Class 1E EDG can be started five times without replenishing air to the receiver tanks.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E22	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E EDG Equipment Protection Trip Bypass	When the Class 1E EDG is started by an engineered safety feature (ESF) actuation signal, Class 1E EDG equipment protection trips, except for [overspeed and generator differential current], are bypassed.	A test will be performed of the Class 1E EDG equipment protection trips.	Class 1E EDG equipment protection trips, except for [overspeed and generator differential current], are bypassed when the Class 1E EDG is started by an ESF actuation signal.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E23	Electrical	Class 1E Power for Safety-Related Equipment	Design Analysis Class 1E EDG Capacity	The Class 1E EDG output rating is greater than the analyzed loads assigned in the respective [XXX] divisions.	An analysis will be performed of the Class 1E as-built EDG Loads.	A report exists and concludes that each Class 1E EDG output rating is greater than the analyzed loads assigned in the respective [XXX] divisions.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E25	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test {Use the following ITAAC if an Alternate AC source exists} Alternate AC Source for Station Blackout	The alternate AC source can be aligned to one train of safe-shutdown equipment within [10 minutes] [or 60 minutes if a Coping analysis exists and supports the increased time interval].	A test or test and analysis will be performed of the alternate AC source.	The alternate AC source can be aligned to one train of safe-shutdown equipment within [10 minutes] [or 60 minutes if a Coping analysis exists and supports the increased time interval].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E26	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection Physical Arrangement	Each [XXX system] electrical division is physically arranged as described in the Design Description and as shown on [Figure x.x.x-x].	An inspection will be performed of the [XXX system] as-built electrical equipment physical arrangement.	The [XXX system] electrical equipment physical arrangement conforms to the Design Description and [Figure x.x.x-x].	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
E27	Electrical	Class 1E Power for Safety-Related Equipment	Preoperational Test Class 1E AC and DC Circuit Interrupting Device Verification	The [XXX system] Class 1E feeder and load circuit breakers for the switchgear, load centers, and MCCs provide instantaneous and thermal overload fault protection.	A test will be performed of the [XXX system] Class 1E feeder and load circuit breakers.	For each [XXX system] Class 1E circuit breaker listed in [Table x.x.x-x], the instantaneous and thermal overload trip points conform to the circuit breaker's design requirements and the breaker coordination analysis.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E28	Electrical	Class 1E Power for Safety-Related Equipment	Design Analysis (Should be As-Built Analysis) Harmonic Distortion Waveforms	The [XXX system] Class 1E equipment is not prevented from performing its safety-related functions by design basis harmonic distortion waveforms.	Analysis of the as-built electric power distribution system will be performed to determine harmonic distortions.	The harmonic distortion waveforms do not exceed acceptable voltage distortion limits [#####] on the Class 1E electric power distribution system.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
E29	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection and Analysis EDG air intake and exhaust locations.	The air intakes for EDG combustion are separated from the EDG exhaust ducts.	Inspection and analysis of the as-built EDG air intakes and exhaust ducts will be performed.	The air intakes and exhaust ducts for each EDG are separated by an analyzed distance and orientation to prevent EDG exhaust gases from being drawn into the EDG's air intakes.	Not applicable to NuScale design. NuScale design does not have this design feature of an Emergency Diesel Generator (EDG).
E30	Electrical	Class 1E Power for Safety-Related Equipment	As-Built Inspection and Analysis Class 1E electric power distribution cables and raceways.	[XXX System] Class 1E electric power distribution cables are routed within their respective division and in Seismic Category I raceways in Seismic Category I structures.	Inspection and analysis of the as-built electric power distribution system cables and raceways will be performed.	The [XXX System] Class 1E electric power distribution cables are routed within their respective division and in Seismic Category I raceways in Seismic Category I structures.	Not applicable to NuScale design. NuScale design does not have this design feature of an Emergency Diesel Generator (EDG).
F02	Fire Protection	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	As-Built Inspection Fire Protection System Water Source {For a large common water supply}	Two redundant and separated freshwater intake suction sources, for the fire protection system fire pumps, are provided in one or more intake structures.	An inspection will be performed of the as-built freshwater intake suction sources.	Two or more redundant freshwater intake suction sources (1) are provided for the fire protection system fire pumps, and (2) are separated, such that the failure of one source will not result in failure of the other source.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
F03	Fire Protection	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	As-Built Inspection Remote Shutdown Transfer Switches – Location	The remote shutdown transfer switches, to transfer control from the main control room to the [remote shutdown station] in the event of a main control room fire, are located in a fire area different than the main control room.	An inspection will be performed of the location of the as-built remote shutdown transfer switches.	The remote shutdown transfer switches are located in a fire area different than the main control room fire area.	Not applicable to NuScale design. NuScale design does not have this design feature of Class 1E power.
F07	Fire Protection	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	As-Built Inspection and Analysis Post-Safe Shutdown Earthquake Fire Protection System Function	The fire protection system piping and components serving areas containing equipment required for safe plant shutdown are seismically qualified to withstand the effects of the safe shutdown earthquake (SSE) without loss of function or pressure boundary integrity. The seismic qualification extends to the [Fire Water Distribution System], fire pump(s), underground fire mains, and aboveground standpipe system(s) that serve the Fire Protection System standpipe(s) serving areas containing equipment required for safe plant shutdown in the event of an SSE.	An inspection and analysis will be performed of the as-built fire protection system piping and components serving areas containing equipment required for safe plant shutdown in the event of an SSE.	The fire protection system piping and components listed in [Table x.x.x-x] are seismically qualified to withstand the effects of the SSE without loss of function or pressure boundary integrity.	Not applicable to NuScale design. NuScale design does not have this design feature of a seismic Category I Fire Protection system.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
M03	Mechanical	Safety-Related Mechanical Equipment	As-Built Inspection and Analysis Steam Dryer Flow Induced Vibration {BWR ONLY}	The steam dryer withstands the effects of flow-induced vibration.	i. An as-built inspection and analysis will be performed of the steam dryer pressure sensors installed for startup testing. ii. An as-built inspection and analysis will be performed of the steam dryer strain gages and accelerometers installed for startup testing. iii. A Fatigue Analysis will be performed of the as-built steam dryer using an NRC-approved methodology that conforms to Regulatory Guide 1.20 Revision 4	i. The number and location of steam dryer pressure sensors will ensure accurate pressure predictions at the steam dryer critical locations. ii. The number and location of steam dryer strain gages and accelerometers are sufficient to: • Monitor the most highly stressed steam dryer components based on the as-built frequency analysis. • Identify potential steam dryer rocking and measure the accelerations resulting from the support and vessel movements. iii. The maximum calculated alternating stress intensity provides a Minimum Alternating Stress Ratio of [2.0] to the allowable alternating stress intensity of 93.7 MPa (13,600 psi). iv. The main steam line and SRV/SV branch-piping geometry precludes first and second shear layer wave acoustic resonance conditions from occurring at normal plant operating conditions.	Not applicable to NuScale design. NuScale design does not have this design feature of steam dryer.
M04	Mechanical	Safety-Related Mechanical Equipment	Preoperational Test Safety-Related Pump Capacity	The [XXX system] safety-related pumps provide the design flow for removing design heat loads.	A test will be performed of the [XXX system] safety-related pumps.	Each [XXX system] safety-related pump listed in [Table x.x.x-x] provides the design flow for removing design heat loads, while the system is aligned in an emergency operating lineup.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related pumps.
M05	Mechanical	Safety-Related Mechanical Equipment	Preoperational Test Safety-Related Pump NPSH	The [XXX system] safety-related pumps have a net positive suction head available (NPSHA) that is greater than or equal to their net positive suction head required (NPSHR).	A test will be performed of the [XXX system] safety-related pumps.	Each [XXX system] safety-related pump listed in [Table x.x.x-x] has a NPSHA that is greater than or equal to the NPSHR while the system is aligned in an emergency operating lineup.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related pumps.
M10	Mechanical	Safety-Related Mechanical Equipment	As-Built Inspection Safety-Related High Point Vent Valves Location	High point vent valves are installed in the safety-related [XXX system] piping high points to allow venting of non-condensable gases from the system.	An inspection will be performed of the safety-related [XXX system] as-built high point vent valves.	High point vent valves are installed in the safety-related [XXX system] at the piping system high point locations.	Not applicable to NuScale design. NuScale design does not have this design feature of vent valves to vent non-condensable gases in safety-related piping systems.
M11	Mechanical	Safety-Related Mechanical Equipment	Vendor Test RCP Flywheel Integrity Overspeed Test	The reactor coolant pump (RCP) flywheel maintains its structural integrity during an overspeed event equal to at least 125 percent of the motor's synchronous speed.	A vendor test will be performed on each as-built RCP flywheel to an overspeed condition.	Each RCP flywheel maintains its structural integrity during overspeed testing at greater than or equal to [### rpm].	Not applicable to NuScale design. NuScale design does not have this design feature of reactor coolant pumps.
M12	Mechanical	Safety-Related Mechanical Equipment	Preoperational Test and Analysis Safety-Related HVAC Design Temperature Control	The [XXX system] provides conditioned air to the [YYY structure/room] to maintain area temperatures within design limits.	An analysis and a test will be performed of the [XXX system].	A report exists and concludes that the [XXX system] is capable of providing conditioned air to maintain temperatures within design limits in the areas supplied by the system while the system is aligned in an emergency operating lineup.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related HVAC.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
M13	Mechanical	Safety-Related Mechanical Equipment	Preoperational Test Safety-Related Fan Capacity	The [XXX system] safety-related fans provide the flow rate required to perform their safety-related function during design-basis accident conditions.	A test will be performed of the [XXX system] safety-related fans.	Each [XXX system] safety-related fan listed in [Table x.x.x-x] provides the minimum airflow rate required during design basis accident conditions to perform its safety-related function, while the system is aligned in an emergency operating lineup.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related fans.
M14	Mechanical	Safety-Related Mechanical Equipment	Preoperational Test Safety-Related Damper Operation	The [XXX system] safety-related dampers change position under design-basis temperature, differential pressure and flow conditions.	A stroke test will be performed of the [XXX system] safety-related dampers.	Each [XXX system] safety-related damper listed in [Table x.x.x-x] strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions sufficient to correlate damper performance to its design-basis capability.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related dampers.
M18	Mechanical	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	Preoperational Test Battery Room Ventilation Flow Rate (Hydrogen Control)	The [XXX system] maintains the hydrogen concentration levels in the battery rooms containing safety-related batteries below one percent by volume.	A test and analysis will be performed to verify the [XXX system] has sufficient airflow to maintain the battery room's hydrogen concentration below one percent by volume during the period of maximum hydrogen generation.	A report exists and concludes the airflow capability of the [XXX system] is sufficient to maintain the hydrogen concentration levels in the battery rooms containing safety-related batteries below one percent by volume during the period of maximum hydrogen generation.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related batteries.
M23 (was NEI M25)	Mechanical	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	Preoperational Test RCS Pressure Boundary Leakage Detection– Sump Level Sensors	[Reactor Containment Building] sump level sensors support Reactor Coolant System Pressure Boundary leakage detection.	A test will be performed of the [Reactor Containment Building] sump level sensors.	The [Reactor Containment Building] sump level sensors detect a sump level increase, which correlates to a detection of unidentified leakage rate of [### gpm] within 1 hour.	Not applicable to NuScale design. NuScale design does not have this design feature of using sumps to detect a reactor coolant pressure boundary leak.
M24 (was NEI M26)	Mechanical	Non-Safety-Related SSC Providing Protection of Safety-Related SSC	Preoperational Test RCS Pressure Boundary Leakage Detection– Radiation Monitors	The [Reactor Containment Building] radiation monitors support Reactor Coolant System Pressure Boundary leakage detection.	A test will be performed of the [Reactor Containment Building] radiation monitors.	The [Reactor Containment Building] radiation monitors detect a radiation level increase, which correlates to a detection of unidentified leakage rate of [### gpm] within 1 hour.	Not applicable to NuScale design. NuScale design does not have this design feature of using radiation monitors to detect a reactor coolant pressure boundary leak.
M30	Mechanical	TBD	Vendor Test Reactor Coolant Pump (RCP) Coastdown Flow	The RCPs provide the coastdown flow assumed in the plant safety analyses.	A vendor test will be performed of each RCP to demonstrate its capability to provide the coastdown flow assumed in the plant safety analyses.	Each RCP's coastdown flow is equal to or greater than the coastdown flow assumed in the plant safety analyses.	Not applicable to NuScale design. NuScale design does not have this design feature of reactor coolant pumps.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
M31 (was NEI M23)	Mechanical	New and Spent Fuel Storage	As-Built Inspection New Fuel Storage Racks	The new 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 sub-criticality during plant life, including normal operations and postulated accident conditions: <ul style="list-style-type: none"> • k-effective must not exceed 0.95 if flooded with unborated water, and • k-effective must not exceed 0.98 if flooded with low-density hydrogenous fluid. 	An inspection will be performed of the as-built new fuel storage racks, their configuration in the new fuel storage area, and the associated documentation.	The as-built new fuel storage racks, including any neutron absorbers, and their configuration within the new fuel storage area conform to the design values for materials and dimensions and their tolerances, as shown to be acceptable in the approved new fuel storage criticality analysis.	Not applicable to NuScale design. NuScale design does not have this design feature of new fuel storage racks.
M34	Mechanical	TBD	As-Built Analysis Potential for Gas Entrainment During Mid-Loop Operations (PWR Only)	The decay heat removal function of the [XXX system] will not be impaired by gas entrainment during mid-loop operation while the system is operating at its maximum allowable flow rate and the reactor coolant hot leg level is at the lowest level allowable for decay heat removal.	An analysis of the potential for gas entrainment during mid-loop operation will be performed on the as-built configuration of the [XXX system].	A report exist and concludes that the decay heat removal function of the [XXX system] will not be impaired by gas entrainment during mid-loop operation while the system is operating at its maximum allowable flow rate and the reactor coolant hot leg level is at the lowest level allowable for decay heat removal.	Not applicable to NuScale design. NuScale design does not have this design feature of mid-loop operation (no RHR pump subject to cavitation).
Q07	Qualification	Safety-Related Equipment Qualification	Equipment Qualification Safety-Related Pump Functional Qualification	The [XXX system] safety-related pumps are functionally designed and qualified to perform their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions [with debris-laden coolant fluids] up to and including design basis accident conditions.	A type test or a combination of type test and analysis will be performed of the [XXX system] safety-related pumps.	A [Functional Qualification Report] performed in conformance to ASME QME-1, as accepted in Regulatory Guide 1.100, exists and concludes that the [XXX system] safety-related pumps listed in [Table x.x.x-x] are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions [with debris-laden coolant fluids] up to and including design basis accident conditions.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related pumps.
Q10	Qualification	Safety-Related Equipment Qualification	Equipment Qualification Safety-Related Tornado Damper Qualification	The [XXX system] safety-related tornado dampers function to change position under the design basis tornado conditions.	i. A type test or combination of type test and analysis will be performed of the safety-related tornado dampers. ii. A test will be performed of the tornado dampers.	i. A report exists and concludes that the [XXX system] safety-related tornado dampers listed in [Table x.x.x-x] can perform their function under design basis tornado conditions. ii. Each tornado damper listed in [Table x.x.x-x] has freedom of motion.	Not applicable to NuScale design. NuScale design does not have this design feature of safety-related tornado dampers.
R09	Radiation Protection	Non-Safety-Related SSC Providing Radiation Protection	As-Built Inspection and Analysis (Analysis not used in ITA) Containment High Range Radiation Monitor - Location	The Containment High Range Radiation Monitors provide independent measurements such that each detector has a direct, unimpeded exposure path of the containment atmosphere free volume to permit assessment of containment conditions following a design basis LOCA.	An inspection will be performed of the as-built Containment High Range Radiation Monitors.	[The unimpeded locations of the high range radiation monitors are as specified in [Table x.x.x-x], OR If the free volume view of the detectors was specified in the design, Each detector has a direct, unimpeded exposure path of [xx%] of the containment atmosphere free volume to permit assessment of containment conditions following a design basis LOCA, as specified in Table x.x.x-x].	Not applicable to NuScale design. NuScale design does not have this design feature of a radiation monitor in Containment.

ITAAC No.	Design Discipline	Design Area	Top-Level Design Features and Performance Characteristics	Design Commitment	Inspection, Test, Analysis	Acceptance Criteria	Disposition Comments
R11	Radiation Protection	Non-Safety-Related SSC Providing Radiation Protection	Preoperational Test Engineered Safety Features (ESF) Heating, Ventilation, and Air Conditioning (HVAC) Duct Leakage Test	The [XXX] ESF System HVAC duct leakage rate is less than the values assumed in the post-accident dose consequence design bases.	The [XXX] ESF System HVAC ducts will be tested for leakage.	The leakage of the [XXX] ESF System HVAC ducts is less than [ZZZ].	Not applicable to NuScale design. NuScale design does not have this design feature of a ESF System HVAC system.
S03	Structural	Containment Pressure Boundary	As-Built Inspection ASME Code Section III Class MC Primary Reactor Containment Design Report (As-Built)	The ASME Code Class MC [primary reactor containment], including the penetration assemblies, complies with the ASME Code Section III.	An inspection will be performed of the ASME Code Class MC as-built [primary reactor containment] Design Report required by ASME Code Section III.	The ASME Code Section III Design Report (NCA-3550) for the ASME Code Class MC [primary reactor containment], including the penetration assemblies, exists and concludes that the requirements of ASME Code Section III are met.	Not applicable to NuScale design. NuScale design does not have this design feature of a ASME Code Class MC components.
S04	Structural	Containment Pressure Boundary	As-Built Inspection ASME Code Section III Code Class MC Data Reports	The ASME Code Class MC components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the ASME Code Class MC as-built component Data Reports, required by ASME Code Section III.	ASME Code Section III Data Reports for the ASME Code Class MC components listed in [Table x.x.x-x] exist and conclude that the requirements of ASME Code Section III are met.	Not applicable to NuScale design. NuScale design does not have this design feature of a ASME Code Class MC components.
S05	Structural	Containment Pressure Boundary	Preoperational Test ASME Code Section III, Division 1, Class MC Primary Reactor Containment -Pressure Test.	The ASME Code Class MC [primary reactor containment] maintains its pressure boundary integrity when subjected to the containment design pressure.	An ASME Code Section III pressure test will be performed of the ASME Code Class MC as-built [primary reactor containment].	The pressure test results for the ASME Code Class MC [primary reactor containment] meet the requirements of ASME Code Section III, Division 1 NE-6000.	Not applicable to NuScale design. NuScale containment vessel is manufactured to ASME Class I NB requirements instead of ASME Code Section III, Division 1 NE-6000. However, this requirement is encompassed by S04, signing the MC Data Report will assure that the pressure test is completed successfully.
S06 (was NEI S05)	Structural	Containment Pressure Boundary	As-Built Inspection ASME Code Section III, Division 2, Class CC Concrete Primary Reactor Containment Design and Construction Reports	The ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, complies with the ASME Code Section III.	An inspection will be performed of the Design and Construction Reports required by ASME Code Section III for the ASME Code Class CC as-built concrete [primary reactor containment], including the liner plate and penetration liners.	The ASME Code Section III Design Report (NCA-3350) and Construction Report (NCA-3380) for the ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, exist and conclude that the requirements of ASME Code, Section III are met.	Not applicable to NuScale design. NuScale design does not have this design feature of a concrete Containment.
S07 (was NEI S06)	Structural	Containment Pressure Boundary	As-Built Inspection ASME Code Section III Code Class CC Data Reports	The ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, conforms to the rules of construction of ASME Code Section III.	An inspection will be performed of the ASME Code Class CC as-built concrete [primary reactor containment] Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, exist and conclude that the requirements of ASME Code Section III are met.	Not applicable to NuScale design. NuScale design does not have this design feature of a concrete Containment.
S08 (was NEI S07)	Structural	Containment Pressure Boundary	Preoperational Test ASME Section III, Division 2, Class CC Concrete Primary Reactor Containment -Structural Integrity	The ASME Code Class CC concrete [primary reactor containment] pressure boundary retains its structural integrity when subjected to the containment design pressure.	A Structural Integrity Test will be performed of the ASME Code Class CC as-built concrete [primary reactor containment].	The Structural Integrity Test results for the ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, meet the requirements of ASME Code Section III, Division 2, CC-6000.	Not applicable to NuScale design. NuScale design does not have this design feature of a concrete Containment.

STANDARDIZED DCA ITAAC

The following table provides the scope and language for the standardized ITAAC that are expected to be applicable to LWR design certification applications.

Each standardized ITAAC is shown with five columns. The two left columns are included to reference and identify the standardized ITAAC; and are not included in the DCA. The three right columns are the standardized ITAAC that are to be incorporated and adapted as appropriate into a DCA. The row below the standardized ITAAC contains a discussion to further clarify the scope of the ITAAC that should be considered for inclusion in Tier 2 Section 14.3; this discussion is not to be included in Tier 1.

Standardized ITAAC are grouped by technical discipline (e.g., Mechanical, Electrical, etc.). Each standardized ITAAC has a corresponding identifier number (e.g., the “Physical Separation of Class 1E Power Circuits” ITAAC is numbered E02) in the left most columns. The letter designation of the identifier corresponds to the technical discipline as follows:

- A (ASME)
- C (Containment)
- E (Electrical)
- F (Fire Protection)
- H (Human Factors Engineering)
- HB (Hazard Barrier)
- I (Instrumentation and Control)
- M (Mechanical)
- Q (Qualification)
- R (Radiation Protection)
- S (Structural)

The second column from the left contains two important pieces of information about the standardized ITAAC; the ITAAC Category (in bold) and the ITAAC type.

The following are descriptions of the ITAAC Categories:

As-Built Analysis

ITAAC - As-built status of the SSC is required in order to perform this ITAAC.

As-Built Inspection

ITAAC - As-built (including as-fabricated) status of the SSC is required in order to perform this ITAAC. As-built inspections may be performed at the final installed location or at a vendor/ module manufacturer.

Design Acceptance Criteria ITAAC - Design Acceptance Criteria (DAC) ITAAC are used to verify satisfactory design completion in those areas in which the design cannot be fully completed prior to approval of the DCD.

Design Analysis ITAAC - ITAAC performed for this category do not require manufacture of equipment nor do they require physical work at a vendor, at a module manufacturer, or at a plant under construction.

Equipment Qualification ITAAC - Qualification of safety-related components, to demonstrate the ability of the component to perform its safety function over the full range of operating conditions (functional capability), during a seismic event (seismic qualification), or in a harsh environment (environmental qualification). Equipment qualification is generally performed by a vendor or a manufacturer at their site.

Preoperational Test ITAAC - A Preoperational Test ITAAC is performed in accordance with a Preoperational Test Procedure described in DCD Section 14.2. Typically, the system is as-built and then released to the startup organization in order to perform these ITAAC.

Vendor Test ITAAC - Vendor tests are performed on fabricated equipment. The vendor test may be performed at the site of manufacture or at a third party site. Vendor tests are different than type tests in that each component of an equipment type must be tested.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C04	Preoperational Test Containment Leak Rate (10 CFR Part 50, Appendix J)	The [primary reactor containment] serves as an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment.	i.—A leakage test will be performed of the [primary reactor containment]. ii.—A leakage test will be performed of the pressure containing or leakage-limiting boundaries, and containment isolation valves.	i.—The leakage rate for the integrated leak-rate test (Type A) meets the requirements of 10 CFR Part 50, Appendix J. ii.—The leakage rate for local leak rate tests (Type B and Type C) for pressure containing or leakage-limiting boundaries and containment isolation valves meets the requirements of 10 CFR Part 50, Appendix J.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section 6.2.x provides a discussion of the leakage testing requirements of the primary reactor containment, which serves as an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment.</p> <p>In accordance with Section 14.2.x, a preoperational test demonstrates that the leakage rate for the integrated leak rate test (Type A) of the [primary reactor containment] and the leakage rate for local leak rate tests (Type B and Type C) for pressure containing or leakage-limiting boundaries and containment isolation valves meet the leakage acceptance criterion of 10 CFR Part 50, Appendix J.</p> <p>Basis of proposed revision: NuScale will apply for exemption to ILRT (part i of ITAAC Acceptance Criteria)</p>				
E24	Preoperational Test Eight-Hour Battery Pack Emergency Lighting Fixtures	Eight-hour battery pack emergency lighting fixtures provide illumination for post-fire safe-shutdown activities performed by operators outside the main control room (MCR) and [remote shutdown station (RSS)] where post-fire safe-shutdown activities are performed.	A test will be performed of the eight-hour battery pack emergency lighting fixtures.	Eight-hour battery pack emergency lighting fixtures <u>illuminate their required target areas</u> to provide at least one foot-candle illumination in the areas outside the MCR or [RSS] where post-fire safe-shutdown activities are performed.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section [9.x] discusses the use of eight-hour battery pack emergency lighting fixtures, which provide illumination of at least one foot-candle for post-fire safe-shutdown activities outside of the MCR and [RSS]. These units should provide lighting for:</p> <ul style="list-style-type: none"> • Areas required for power restoration / recovery to comply with the guidance of Regulatory Guide 1.189 “Fire Protection for Nuclear Power Plants.” • Areas where normal actions are required for operation of equipment needed during fire; and • Stairwells serving as escape or access routes for firefighting and the remote shutdown area. <p>In accordance with Section 14.2.x, a preoperational test demonstrates that eight-hour battery pack emergency lighting fixtures illuminate their required target areas and <u>to</u> provide at least one foot-candle illumination in the areas outside the MCR or [RSS] where post-fire safe-shutdown activities are performed.</p>				

<p>Basis of proposed revision: Minor wording change proposed to ITAAC E24 acceptance criteria to add the phrase “illuminate their required target areas”. This then would agree with the change made by the NRC to Tier 2 Section 14.3 Discussion of ITAAC Implementation which is "illuminate their required target areas".</p>				
HB2	As-Built Inspection Internal Flood Protection/Flooding Barriers	Internal flooding barriers provide confinement so that the impact from internal flooding is contained within the [YYY structure] flooding area of origin.	An inspection will be performed of the [YYY structure] as-built internal flooding barriers.	The following [YYY structure] internal flooding barriers <u>exist in accordance with the [internal flooding analysis report] and have been qualified as specified in the [internal flooding analysis report].</u> are installed and qualified for their intended use: <ul style="list-style-type: none"> • [Watertight doors] as described in [Table x.x.x x or Figure x.x.x x]. • [Curbs and sills] as described in [Table x.x.x x or Figure x.x.x x]. • Walls as described in [Table x.x.x x or Figure x.x.x x]. • [Water tight penetration seals] as described in [Table x.x.x x or Figure x.x.x x].
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation Section 3.4.1.x discusses the features used to mitigate or eliminate the consequences of internal flooding, which include structural enclosures, barriers, curbs, sills, and watertight seals. An ITAAC inspection is performed to verify that the following [YYY structure] as-built internal flooding barriers are installed <u>in accordance with the [internal flooding analysis report]</u> and <u>are qualified per their design requirements as specified in the [internal flooding analysis report]</u>:</p> <ul style="list-style-type: none"> • Watertight doors. • Curbs and sills. • Walls. • Watertight penetration seals. <p>The objective of the inspection is to verify that the flooding barriers meet the design requirements, location requirements, and that they are qualified for their intended use based upon visual inspection and review of the as-built drawings and qualification documentation.</p>				

Basis of proposed revision:

The NRC-proposed ITAAC acceptance criteria requires watertight doors, curbs, sills and water tight penetration seals to be identified in Tier 1 tables or figures at the time of DCA submittal. This level of design detail may not be known at the time of DCA submittal. For example, conduit and piping penetrations may not be designed prior to DCA submittal. Thus, water tight penetration seals cannot be identified in a Tier 1 table...

The proposed revision allows the COL to reference an internal flooding analysis report or similar document that can be finalized after DCA submittal as the source document to identify internal flooding barriers. The reference to the internal flooding analysis report will be made in both the ITAAC acceptance criteria and in the Tier 2 Section 14.3 Discussion of ITAAC Implementation.

Note: The strategy proposed for standardized ITAAC HB2 aligns with the strategy contained in the acceptance criteria of NRC-proposed ITAAC HB1 which states “The following [YYY structure] fire and smoke barriers exist, and are qualified in accordance with the [fire hazards analysis]:

- Fire-rated doors.
- Fire-rated penetration seals.
- Smoke barriers

HB5	As-Built Inspection External Flood Protection/Flooding Barriers	The Seismic Category I [YYY structure] structural walls or floors located below grade elevation are protected against external flooding in order to prevent flooding of safety-related SSC within the structure.	An inspection will be performed of the [YYY structure] as-built exterior flooding barriers.	<p>The following [YYY structure] exterior flooding barriers <u>exist in accordance with the [external flooding analysis report] and have been qualified as specified in the [external flooding analysis report]</u>are installed and qualified for their intended use:</p> <ul style="list-style-type: none"> • [Water stops in expansion and construction joints located below design basis maximum flood or groundwater levels.] • [Waterproofing of exterior surfaces located below design basis maximum flood or groundwater levels.] • [Watertight seals in exterior wall or floor penetrations located below design basis maximum flood or groundwater levels.]
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section 3.4.1.x discusses that the [YYY structure] may be subjected to the design basis flood and is designed to withstand the design basis maximum flood levels and design basis groundwater levels. This is done by incorporating structural provisions into the plant design to protect the [YYY structure] from the postulated conditions. An ITAAC inspection is performed to verify that the following [YYY structure] as-built ~~exterior-external~~ flooding barriers are installed in accordance with the [external flooding analysis report] and are qualified as specified in the [external flooding analysis report]~~approved design~~:

- [Water stops in expansion and construction joints located below design basis maximum flood or groundwater levels.]
- [Waterproofing of exterior surfaces located below design basis maximum flood or groundwater levels.]
- [Watertight seals in exterior walls or floors penetrations located below design basis maximum flood or groundwater levels.]

The objective of the inspection is to verify that the flooding barriers meet the design requirements, location requirements are installed in the required location and that they are qualified for their intended use by-based upon visual inspection and review of the as-built drawing(s) and the qualification documentation.

Basis of proposed revision:

NRC-proposed ITAAC HB5 acceptance criteria requires water stops, waterproofing and watertight seals to be identified in Tier 1 tables or figures at the time of DCA submittal. This level of design detail may not be known at the time of DCA submittal.

The proposed revision allows the COL to reference an external flooding analysis report or similar document that can be finalized after DCA submittal as the source document to identify external flooding barriers. The reference to the external flooding analysis report will be made in both the ITAAC acceptance criteria and in the Tier 2 Section 14.3 Discussion of ITAAC Implementation.

Note: The strategy proposed for standardized ITAAC HB2 aligns with the strategy contained in the acceptance criteria of NRC-proposed ITAAC HB1 which states “The following [YYY structure] fire and smoke barriers exist, and are qualified in accordance with the [fire hazards analysis]:

- Fire-rated doors.
- Fire-rated penetration seals.
- Smoke barriers

101	<p>Design Analysis Software Lifecycle</p>	<p>The [XXX system] design and software are implemented using a quality process composed of the following software lifecycle phases, with each phase having outputs which satisfy the requirements of that phase.</p> <ol style="list-style-type: none"> 1. [Phase Name 1]. 2. [Phase Name 2]. N. [Phase Name N]. 	<ol style="list-style-type: none"> i. An analysis will be performed of the output documentation of [Phase Name 1]. ii. An analysis will be performed of the output documentation of [Phase Name 2]. N. An analysis will be performed of the output documentation of [Phase Name N]. 	<ol style="list-style-type: none"> i. The output documentation of the [XXX system] [Phase Name 1] satisfies the requirements of [Phase Name 1]. ii. The output documentation of the [XXX system] [Phase Name 2] satisfies the requirements of [Phase Name 2]. N. The output documentation of the [XXX system] [Phase Name N] satisfies the requirements of [Phase Name N].
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

The purpose is to verify software implementation based on licensing commitments to 10 CFR Part 50, Appendix A, General Design Criterion 1 (Quality), Appendix B (Quality Assurance Criteria), BTP 7-14, Regulatory Guides 1.28, 1.152, 1.168, 1.169, 1.170, 1.171, 172, and 173, and the associated IEEE standards. The licensee shall perform analyses for each phase and generate technical reports to conclude that the lifecycle phases were implemented per the licensing commitments. Per Regulatory Guide 1.152, a generic waterfall software life cycle model consists of the following phases: (1) concepts, (2) requirements, (3) design, (4) implementation, (5) test, (6) installation, checkout, and acceptance testing, (7) operation, (8) maintenance, and (9) retirement. Representative output documentation is listed in BTP 7-14, Sections B.2.2, “Software Life Cycle Implementation,” and B.2.3, “Software Life Cycle Process Design Output.” For acceptance criteria guidance, see BTP 7-14, Sections B.3.2, “Acceptance Criteria for Implementation,” and Section B.3.3, “Acceptance Criteria for Design Outputs.”

The ITAAC verifies that output documentation of each Software Lifecycle phase satisfies the requirements of that phase ~~and that software were implemented per licensing commitments.~~

Basis of proposed revision:

Tier 2 Section 14.3 Discussion of ITAAC Implementation contains the commitment “and that software were implemented per licensing commitments.” Tier 2 Section 14.3 Discussion of ITAAC Implementation is designed to provide additional clarity on the intent and verification methods for each ITAAC. However, the commitment to verify software is implemented per licensing commitments is not contained in the standardized ITAAC I01. Therefore, it is proposed to delete the phrase “and that software were implemented per licensing commitments” from the Tier 2 Section 14.3 Discussion of ITAAC Implementation.

I15	Preoperational Test Protection System - Completion of Protective Actions	A [Protection System] 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 [Protection System] reactor trip and engineered safety features signals.	<ol style="list-style-type: none"> i. Upon initiation of a real or simulated [Protection System] [reactor trip signal] <u>listed in [Table x.x.x-x]</u>, the reactor trip breakers open and do not automatically close when the [Protection System] signal is reset. ii. Upon initiation of a real or simulated [Protection System] [engineered safety feature actuation signal] <u>listed in [Table x.x.x-x]</u>, the engineered safety features (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 [Protection System] signal is reset.
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section 7.x describes compliance with requirements for completion of protective actions, which requires that, once initiated, the reactor trip and ESF proceed to completion and remain in their required position/condition until the actuation system is reset and operator action is taken.

In accordance with Section 14.2.x, a preoperational test demonstrates that:

- i. Upon a [Protection System] reactor trip signal listed in [Tier 1 Table x.x.x-x], the reactor trip breakers open and do not automatically close when the [Protection System] reactor trip signal is reset.
- ii. Upon a [Protection System] engineered safety feature actuation signal listed in [Tier 1 Table x.x.x-x], 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 [Protection System] signal is reset.

Basis of proposed revision:

NRC-proposed standardized ITAAC I15 does not contain references to Tier 1 tables. The reference to Tier 1 tables in the acceptance criteria and the Tier 2 Section 14.3 Discussion of ITAAC Implementation is necessary to identify the scope of the ITAAC.

Refer to similar ITAAC I07, I08, I10, I12, I14, I16, I17, I20, I22, I23, and I24 that contain references to tables.

I21	<p>Vendor Test Protection System -Self-Testing Features</p>	<p>The [Protection System] self-test features detect faults in the system and provide an alarm in the main control room and [remote shutdown station].</p>	<p>A vendor test will be performed of the [Protection System].</p>	<p>A report exists and concludes that:</p> <ul style="list-style-type: none"> • [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 to within a sufficient timeframe to ensure safety function is not lost. • The presence and type of fault is indicated by the [Protection System] alarms and displays.]
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

This ITAAC is intended to address self-testing features credited towards surveillance or other operational testing. Given the nature of this ITAAC, it is acceptable to verify ITAAC completion during the factory acceptance testing (FAT). Self-testing features include, but are not limited to, watchdog timers, automated channel checks, and signal input comparisons.

Section 7.x discusses the self-testing features of the [Protection system], including the types of faults that should be detected, the system responses to such faults, the required response times, and the ability for alarms and displays in the main control room and remote shutdown system to provide indication of such faults' existence. Branch Technical Position (BTP) 7-17 provides guidance on self-testing and surveillance test provisions.

These tests of the [Protection system] self-testing features ensure that a) faults requiring detection are detected, b) the system responds appropriately to each fault based on the type of fault, c) the response occurs within a sufficient timeframe to ensure safety function is not lost, and d) that alarms and indications that will be located in the main control room and remote shutdown station indicate the type of fault present.

A vendor test demonstrates and 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 to within a sufficient timeframe to ensure safety function is not lost.
- Self-testing features verify that detected faults are indicated by alarms and displays.]

Basis of proposed revision:

Minor change proposed to reinstate the brackets that were contained in NEI 15-02. The NRC-proposed standardized ITAAC I21 does not have brackets in the acceptance criteria or in the Tier 2 Section 14.3 Discussion of ITAAC Implementation. The implementation of the brackets would allow an applicant to provide design-specific acceptance criteria that may be more specific than the general acceptance criteria found in the standardized ITAAC.

I22	Preoperational Test Main Control Room and [Remote Shutdown Station] Displays and Alarms	The [XXX system] Displays and Alarms identified by the human factors engineering process are indicated on the [XXX system] operator workstation in the main control room (MCR) and [remote shutdown station (RSS)].	<ul style="list-style-type: none"> i. An inspection will be performed for the ability to retrieve the [XXX system] as-built displays and alarms on the operator workstations in the MCR. ii. An inspection will be performed for the ability to retrieve the [XXX system] as-built displays and alarms on the operator workstation in the [RSS]. 	<ul style="list-style-type: none"> i. The [XXX system] displays and alarms listed in [Table x.x.x-x] are retrieved and displayed on the operator workstations in the MCR. ii. The [XXX system] displays and alarms listed in [Table x.x.x-x] are retrieved and displayed on the operator workstation in the [RSS].
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

[Section x.x] describes the [XXX system] Displays and Alarms indicated on the operator workstations in the MCR and [RSS].

An inspection for the ability to retrieve and display the various system parameters and alarms at the as-built operator work stations in the main control room and [remote shutdown station] will be performed. [The intent is to verify that the displays and alarms function during testing of the integrated as-built system; however, separate testing of the actual operation of the system alarms and displays using simulated signals may be acceptable where this is not practical.]

<p>Basis of proposed revision: The stated scope described in the Tier 2 Section 14.3 Discussion of ITAAC Implementation is to “verify that the displays and alarms function during testing of the integrated as-built system”, This population of displays and alarms far exceeds those displays and alarms associated with Important Human Actions. Clarification of intent of the ITAAC is required.</p> <p>NuScale does not propose to submit ITAAC I22 for DCA.</p>			
I23	<p>Preoperational Test <u>Important Human Actions</u> Controls Located on the Operator Workstations in the Main Control Room and [Remote Shutdown Station] Controls</p>	<p>The [XXX system] controls located on the operator workstations in the main control room (MCR) and [remote shutdown station (RSS)] operate to perform <u>Important Human Actions</u>.their required function(s).</p>	<ul style="list-style-type: none"> i. Tests will be performed of the [XXX system] controls on the operator workstations in the MCR. ii. Tests will be performed of the [XXX system] controls on the operator workstation in the [RSS].
<ul style="list-style-type: none"> i. The [XXX system] <u>Important Human Actions</u> controls provided on the operator workstations in the MCR perform the functions listed in [Table x.x.x-x]. ii. The [XXX system] <u>Important Human Actions</u> controls provided on the operator workstation in the [RSS] perform the functions listed in [Table x.x.x-x]. 			
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation [Section x.x] describes the [XXX system] controls on the [XXX] operator workstations in the MCR and [RSS]. In accordance with Section 14.2.x, a preoperational test will be performed to verify the [XXX system] <u>Important Human Actions controls</u> components can be manually operated from the operator workstations in the main control room and [remote shutdown station].</p>			
<p>Basis of proposed revision: Neither the ITAAC nor the Tier 2 Section 14.3 Discussion of ITAAC Implementation provides a defined scope of controls that must be verified by ITAAC. A definition of scope is required.</p>			
I25	<p>As-Built Inspection Protection System Reactor Trip Breakers Installation and Arrangement</p>	<p>The reactor trip breakers are lubricated, installed, and arranged in order to successfully accomplish the reactor trip function under design conditions.</p>	<p>An inspection of the as-built reactor trip breakers, including the connections for the shunt and undervoltage trip mechanism and auxiliary contacts, will be performed.</p>
<p>The reactor trip breakers are lubricated, have the proper connections for the shunt and undervoltage trip mechanisms and auxiliary contacts, and are arranged as shown in [Figure x.x.x-x] to successfully accomplish the reactor trip function under design conditions.</p>			

Tier 2 Section 14.3 Discussion

Section 7.x discusses the arrangement of the protection system reactor trip breakers. Figure 7.x-x provides the arrangement of the reactor trip breakers. This ITAAC inspection verifies that the reactor trip breakers conform to the arrangement indicated in the Tier 1 design figure in order to support breaker operation (such as 2 out of 4 voting) and testing for various combinations of trip signals. In addition, the ITAAC inspection verifies correct installation of the reactor trip breakers including, but not limited to: (1) lubrication (an issue during the Salem ATWS event) and (2) proper connection of the shunt and undervoltage trip mechanisms and other auxiliary contacts.

Basis of proposed revision:

The NRC-proposed standardized ITAAC I25 acceptance criteria requires verification that a consumable (lubrication) is applied to the reactor trip breaker. Verification of consumables does not meet first principles for ITAAC in that the verified design is expected to be in place for the lifetime of the plant. The lubrication of a reactor trip breaker is a periodic maintenance activity. For example, lubrication of the reactor trip breaker after ITAAC verification and prior to a 103(g) finding would require the ITAAC be re-executed.

ITAAC I25 acceptance criteria also require that functional arrangement verification be made of the each reactor trip breaker. This functional arrangement requirement is unnecessary because the verification of reactor trip breaker wiring is satisfied by successful execution of standardized ITAAC I09 (automatic reactor trip verification); I11 (manual reactor trip verification); I13 (reactor trip on loss of power); I15 (completion of protective actions).

NuScale does not propose to submit ITAAC I25 for DCA.

M06	Preoperational Test Safety-Related Valve Operation	The [XXX system] safety-related valves change position under design-basis temperature, differential pressure, and flow conditions.	A diagnostic stroke -test will be performed of the [XXX system] safety-related valves under preoperational temperature, differential pressure, and flow conditions.	Each [XXX system] safety-related valve listed in [Table x.x.x-x] strokes fully open and fully closed by remote operation (or manual operation if a manually operated valve) under preoperational temperature, differential pressure, and flow conditions with sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC-Q06].
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

The [XXX system] safety-related valves are ~~diagnostically~~ tested by remote operation ~~(or manual operation if a manually operated valve)~~ to demonstrate the capability to perform their function to transfer open and transfer closed under preoperational temperature, differential pressure, and flow conditions ~~sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06].~~

In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] safety-related valves listed in [Tier 1 Table x.x.x-x] stroke fully open and fully closed by remote operation ~~(or manual operation if a manually operated valve)~~ under preoperational test conditions ~~with the evaluation of diagnostic data.~~

Preoperational test conditions are established that approximate design-basis temperature, differential pressure, and flow conditions to the extent practical, consistent with preoperational test limitations.

Basis of proposed revision:

Propose to delete the phrase “with sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06]” from the acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of ITAAC M06

The NRC-proposed acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of NRC-proposed standardized ITAAC M06 would require as-built equipment qualification of a safety-related valve during preoperational testing while the valve is operating under preoperational test conditions. The proposed ITAAC M06 acceptance criterion requires “sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with ITAAC Q06”. The proposed acceptance criteria would require that each safety-related valve be procured to have valve qualification data be obtained not only at the specified accident design conditions, but also require that qualification data be obtained at preoperational test conditions, conditions unknown at the time of valve qualification testing. The qualification data obtained at specified preoperational test conditions would then be compared to the qualification data taken during preoperational testing. This requirement is not supported by regulations, regulatory guidance, nor was this requirement imposed in ITAAC for previously approved designs.

In addition, the NRC-proposed acceptance criteria and the proposed Tier 2 Section 14.3 Discussion of ITAAC Implementation of NRC-proposed standardized ITAACM06 requires that a preoperational test verify that manual valves (versus automated valves) can be opened and/or during preoperational testing. This requirement is not supported by regulations, regulatory guidance, nor was this requirement imposed in ITAAC for previously approved designs.

NuScale proposes to submit the NEI-proposed M06 ITAAC shown in the markup above.

M07	Preoperational Test Safety-Related Check Valve Operation	The [XXX system] safety-related check valves will open and close under design-basis temperature, differential pressure and flow conditions.	Stroke-A tests will be performed of the [XXX system] safety-related check valves under preoperational temperature, differential pressure and flow conditions.	Each [XXX system] safety-related check valve listed in [Table x.x.x-x] strokes fully open and closed (under forward and reverse flow conditions, respectively) under preoperational temperature, differential pressure, and flow conditions sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06].
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

The [XXX system] safety-related check valves are tested to demonstrate the capability to perform their function to transfer open and transfer closed (under forward and reverse flow conditions, respectively) under preoperational temperature, differential pressure, and flow conditions ~~sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06].~~

In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] check valves listed in [Tier 1 Table x.x.x-x] strokes fully open and closed under forward and reverse flow conditions, respectively.

Preoperational test conditions are established that approximate design-basis temperature, differential pressure and flow conditions to the extent practical, consistent with preoperational test limitations.

Basis of proposed revision:

Propose to delete the phrase “with sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06]” from the acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of ITAAC M07.

The NRC-proposed acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of NRC-proposed standardized ITAAC M07 would require as-built equipment qualification of a safety-related check valve during preoperational testing while the valve is operating under preoperational test conditions. The proposed ITAAC M07 acceptance criterion requires “sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with ITAAC Q06”. The proposed acceptance criteria would require that each safety-related check valve be procured to have valve qualification data be obtained not only at the specified accident design conditions, but also require that qualification data be obtained at preoperational test conditions, conditions unknown at the time of valve qualification testing. The qualification data obtained at specified preoperational test conditions would then be compared to the qualification data taken during preoperational testing. This requirement is not supported by regulations, regulatory guidance, nor was this requirement imposed in ITAAC for previously approved designs.

NuScale proposes to submit the NEI-proposed M07 ITAAC shown in the markup above.

M08	Preoperational Test Safety-Related Air-Operated Valve Operation on Loss of Motive Power	The [XXX system] safety-related air-operated valves perform their function to fail to (or maintain) their safety-related position on loss of motive power under design-basis temperature, differential pressure, and flow conditions.	A stroke -test will be performed of the safety-related air-operated valves under preoperational temperature, differential pressure and flow conditions.	Each [XXX system] safety-related air-operated valve listed in [Table x.x.x-x] performs its function to fail to (or maintain) its safety-related position on loss of motive power under preoperational temperature, differential pressure, and flow conditions- sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06].
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

The [XXX system] safety-related air-operated valves are tested to demonstrate the capability to perform their function to fail to or maintain their safety-related position on loss of motive power under preoperational temperature, differential pressure, and flow conditions-~~sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06].~~

In accordance with Section 14.2.x, a preoperational test demonstrates that each [XXX system] safety-related air-operated valves listed in [Tier 1 Table x.x.x-x] repositions to or maintains its safety-related position on loss of motive power (electric power to the valve actuating solenoid(s) is lost, or pneumatic pressure to the valve(s) is lost).

Preoperational test conditions are established that approximate design-basis temperature, differential pressure, and flow conditions to the extent practical, consistent with preoperational test limitations.

Basis of proposed revision:

Propose to delete the phrase “sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06]” from the acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of ITAAC M08.

The NRC-proposed acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation** of NRC-proposed standardized ITAAC M08 would require as-built equipment qualification of a safety-related as-operated valve during preoperational testing while the valve is operating under preoperational test conditions. The proposed ITAAC M08 acceptance criterion requires preoperational data be obtained that is “sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with [ITAAC Q06]”. The proposed acceptance criteria would require that each safety-related air-operated valve be procured to have valve qualification data be obtained not only at the specified accident design conditions, but also require that qualification data be obtained at preoperational test conditions, conditions unknown at the time of valve qualification testing. The qualification data obtained at specified preoperational test conditions would then be compared to the qualification data taken during preoperational testing. This requirement is not supported by regulations, regulatory guidance, nor was this requirement imposed in ITAAC for previously approved designs.

NuScale proposes to submit the NEI-proposed M08 ITAAC shown in the markup above.

M16	Preoperational Test Main Control Room Habitability System Automatic Alignment	Upon receipt of a [required isolation] signal, the [XXX system] automatically aligns to isolate the Control Room Envelope.	A test will be performed of the [XXX system].	Upon receipt of each [required isolation] actuation signal, the [XXX system] dampers automatically align to the position listed in [Table x.x.x-x].
Tier 2 Section 14.3 Discussion of ITAAC Implementation Section 9.4.x provides a description of the main control room HVAC system alignments in response to a [required isolation] signal. In accordance with Section 14.2.x, a preoperational test demonstrates that upon receipt of each [required isolation] signal, the [XXX system] automatically aligns to the position listed in [Tier 1 Table x.x.x-x]. <u>A manual signal, automatic signal, or simulated automatic signal may be used for the test.</u>				
Basis of proposed revision: Propose to add the phrase “A manual signal, automatic signal, or simulated automatic signal may be used for the test.” NEI-proposed standardized ITAACM16, Tier 2 Section 14.3 Discussion of ITAAC Implementation, stated “A manual signal, actual automatic signal, or simulated automatic signal may be used for the test.” This option was deleted by the NRC-proposed standardized ITAAC M16. The option to use a real or simulated signal is allowed by other NRC-proposed ITAAC, such as E11, E22, I09, I15, and I22.				
M20	As-Built Inspection Crane Hoist Single Failure Proof Configuration	The single failure proof [ZZZ crane] hoist is constructed to provide assurance that a failure of a single hoist mechanism component does not result in the uncontrolled movement of the lifted load.	An inspection will be performed of the as-built [ZZZ crane] hoist.	The [ZZZ crane] hoist is single failure proof.

Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section [9.1.4.x or 9.1.5.x] describes that the [ZZZ crane] is classified as a Type I crane as defined by the ASME NOG-1 Code, Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder), or equivalent.

An ITAAC inspection is performed of the [ZZZ crane] hoist machinery arrangement to verify the existence of the following single-failure proof features: (a) non redundant structural components (~~i.e.,~~ bridge, trolley, wire rope drum, and hook) are designed to appropriate standards, constructed from base material demonstrated to meet appropriate material properties, and pass appropriate non-destructive examination of ~~critical welds and plate, bar, and~~ forging materials; and, (b) redundant design features to stop and hold the load following:

- Specified component failures (e.g., wire rope, drive train, and control system).
- Operator errors (e.g., two-blocking and overload).

This ITAAC inspection may be performed any time after manufacture of the [ZZZ crane] (at the factory or later).

Basis of proposed revision:

Proposed minor wording change to ITAAC M20, Tier 2 Section 14.3 Discussion of ITAAC Implementation, to duplicate the wording of the ASME NOG-1 Code, Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder).

M25	<p>Preoperational Test RCS Pressure Boundary Leakage Detection– Alternative Method</p> <p><i>{This ITAAC is only necessary if one or both of M25-M23 and M26-M24 for RCPB detection are not applicable to the design}</i></p>	<p>The [XXX system] supports Reactor Coolant System Pressure Boundary leakage detection.</p>	<p>A test and analysis will be performed of the [XXX system].</p>	<p>The [XXX system] [detection method(s)] detect(s) a [measured parameter] increase which correlates to a detection of unidentified leakage rate of [### gpm] within 1 hour.</p>
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section 5.2.5 discusses that RCPB leakage detection systems are designed to detect and, to the extent practical, identify the source of reactor coolant leakage. The RCPB leakage detection systems conform to the guidance of Regulatory Guide 1.45, regarding detection, monitoring, quantifying, and identification of reactor coolant leakage.

In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] [detection method(s)] detect(s) a [measured parameter] increase which correlates to a detection of unidentified leakage rate of [### gpm] within 1 hour.

The analysis of the correlation will consider such features as [insert criteria].

Basis of proposed revision:

Minor correction proposed for ITAAC reference numbers (M25 to M23) and (M26 to M24) to compensate for NRC renumbering of ITAAC. Delete the phrase “and analysis” added by the NRC in the ITA section. The ITAAC type is a “preoperational test” which does not require analysis.

M27	As-Built Inspection Installed Configuration	The installed configuration of the [XXX system], including its flowpath, is consistent with procurement, construction, and installation specifications such that the system’s safety functions can be achieved.	Inspection of the as-built [XXX system] will be performed to verify the installed configuration, including the flowpath.	The [XXX system] installed configuration, including the flowpath, of the components listed in [Table x.x.x-x] is consistent with procurement, construction, and installation specifications such that the system’s safety functions can be achieved.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Verification of the installed configuration of the system includes verifying that the system and its components are installed in a manner that supports the safety functions for which the system is intended, consistent with procurement, construction, and installation specifications. This verification should include visual inspection (e.g., walkdown) of the systems, including their flowpath, and may be performed in conjunction with other preoperational activities. Examples of the verification performed by the licensee to complete this ITAAC include confirmation of valve orientation, inspection of installation (e.g., use of appropriate and calibrated tools), verification of adequate sloping of piping in accordance with design provisions, verification of adequate access for inservice inspection (ISI) and inservice testing (IST) activities and confirmation that interferences are avoided.</p>				
<p>Basis of proposed revision:</p> <p>The design commitment of M27 requires verification that the installation of all safety-related components be verified to satisfy <i>all</i> installation details found in each component’s procurement, construction and installation specifications. This ITAAC does not meet the first principle that “ITAAC are a focused subset of construction verification activities” because there is no clearly defined scope within the language of the design commitment of ITAAC M27. The NEI SMR industry ITAAC standardization initiative performed by the NRC and the nuclear industry had as one of primary objectives to provide a focused set of ITAAC for construction verification activities. No other ITAAC has stipulated the verification of procurement, construction or installation specifications because this language does not provide this focus.</p> <p>However, the collection of all other standardized as- built ITAAC requirements do satisfy the first principle of a focused subset of construction verification activities.</p> <p>Example: Safety-Related Valve ITAAC</p> <ul style="list-style-type: none"> • As-built ITAAC associated with safety related valves are (by discipline): A02, A04, C04, C05, C06, I03, I04, Q01, and Q02 (additional electrical as-built inspection ITAAC are required for designs with Class 1E electrical systems). • The following are as-built inspection ITAAC required to verify the non-safety-related systems protect the safety function of safety-related valves (by discipline): A07, F06, HB1, HB2, HB3, HB4, HB5, R01, and S02. • Associated safety-related valve qualifications ITAAC are (by discipline): Q01, Q02, Q03, Q06 and Q08. • Associated safety-related valve preoperational test ITAAC are (by discipline): I10, I12, I14, I15, I16, M06, M07, and M08 <p>Note: Tier 2 Section 14.3 Discussion of ITAAC Implementation allows that the required inspections may be performed in conjunction with preoperational testing. However, inspection activities are completed prior to preoperational testing, generally before system turnover from the construction organization to the startup test organization.</p> <p>NuScale does not propose to submit ITAAC M27 for DCA.</p>				

M28	As-Built Inspection and Analysis Physical separation of divisions.	Each division of the [XXX system] is physically separated from the other divisions to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.	Inspection and analysis of the as-built [XXX system] divisions will be performed.	The components for each division of the [XXX system] located outside containment are located in a separate enclosed area as identified in [Table x.x.x-x], [and the components for each division of the [XXX system] located within containment are physically separated to the extent practical] to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation [Section xx] describes the physical separation of [XXX system] divisions. An inspection and analysis is performed to verify each division of the [XXX system] is physically separated to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.</p>				
<p>Basis of proposed revision: The acceptance criteria for standardized ITAAC M28 requires a verification that components are separated to preclude loss of safety-related functions due to (a) missile and pipe break hazards; (b) internal flooding; and (c) fire. This function is redundant to other ITAAC because protection for these stated hazards are already verified by (a) standardized ITAAC A07, as-built inspection for pipe break hazards protective features verification; (b) standardized ITAAC HB2, as-built inspection for internal flooding barriers including walls and watertight doors; (c) standardized ITAAC F06, as-built analysis of the fire protection features (including separation); and (d) standardized ITAAC HB1, as-built inspection of fire and smoke barriers including fire-rated walls, floors and ceilings.</p> <p>NuScale does not propose to submit ITAAC M28 for DCA.</p>				

M33	As-Built Inspection Spent Fuel Pool Drain Down Prevention	The spent fuel storage pool, piping and connections are designed and located to prevent the drain down of the spent fuel pool water level below the minimum safety water level.	An inspection will be performed of the as-built spent fuel pool, piping and connections.	The inspection verifies that: <ul style="list-style-type: none"> • There are no openings, piping penetrations, or connections below the top of the irradiated fuel assemblies. • All piping penetrations and connections below [the minimum safety water level] elevation are designed as Seismic Category I, and • All non-Seismic Category I piping that extends below [the minimum safety water level] is equipped with anti-siphon devices at or above the [minimum safety water level] elevation.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section 9.1.2 discusses spent fuel storage.</p> <p>An ITAAC inspection of the as-built spent fuel storage pool is performed to verify the design features of the spent fuel pool, piping, and connections prevent drain down of the spent fuel pool water level below the minimum safety water level.</p>				
<p>Note: NRC renumbered and revised NEI-proposed standardized ITAAC R03 as M33.</p> <p>Basis of proposed revision:</p> <p>The acceptance criteria of NEI-proposed standardized ITAAC R03 stated, “There are no gates, openings, drains, or piping within the spent fuel pool that are below [### ft.] as measured from the bottom of the spent fuel pool.” The minimum level specified in the acceptance criteria is the minimum water level required for shielding and for cooling of the spent fuel.</p> <p>Acceptance criterion (1) for NRC-proposed ITAAC M33 allows an unsafe opening below the minimum water level for shielding.</p> <p>Acceptance criterion (2) for NRC-proposed ITAAC M33 allows piping and connections below the minimum safety water level if it is seismic category I, which means the spent fuel pool can be drained due to siphoning.</p> <p>NuScale proposes to use NEI-proposed standardized ITAAC R03 (renumbered as M33) instead of the NRC-proposed M33 above</p>				

Q01	Equipment Qualification and As-Built Inspection Seismic Category I Equipment Qualification/ Installation	The [XXX system] Seismic Category I equipment, including its associated supports and anchorages, withstands design basis seismic loads without loss of its safety function(s) during and after a safe-shutdown earthquake (SSE).	i. A type test, analysis, or a combination of type test and analysis will be performed of the [XXX system] Seismic Category I equipment, including its associated supports and anchorages. ii. An inspection will be performed of the [XXX system] Seismic Category I as-built equipment, including its associated supports and anchorages.	i. A [seismic qualification report] performed in conformance to IEEE-344 2004 and ASME QME-1 2007 (or later editions), as accepted in Regulatory Guide 1.100 Revision 3 (or later revision) , exists and concludes that the [XXX system] Seismic Category I equipment listed in [Table x.x.x-x], including its associated supports and anchorages, will withstand the design-basis seismic loads and perform its safety function during and after an SSE. ii. The [XXX system] Seismic Category I equipment listed in [Table x.x.x-x], 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 report].
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section 3.10 presents information to demonstrate that the Seismic Category I equipment, including its associated supports and anchorages, is qualified by type test, analysis, or a combination of type test and analysis to perform its safety function under the design basis seismic loads during and after a safe-shutdown earthquake (SSE). The qualification method employed for the Seismic Category I equipment is the same as the qualification method described for that type of equipment in Section 3.10.x. This method conforms to IEEE-344-2004 and ASME QME-1-2007 (or later editions), as accepted by the NRC staff in Regulatory Guide 1.100 Revision 3 (or later revision), with specific revision years and numbers as presented in Section 3.10.x.</p> <p>The ITAAC verifies that: (1) a [seismic qualification report] exists for each Seismic Category I component type, and (2) the [seismic qualification report] concludes that the Seismic Category I equipment listed in [Tier 1 Table x.x.x-x], including its associated supports and anchorages, is qualified to perform its safety function(s) under the seismic design-basis load conditions specified in the [seismic qualification report].</p> <p>After installation in the plant, an ITAAC inspection is performed to verify that the Seismic Category I equipment listed in [Tier 1 Table x.x.x-x], including its associated supports and anchorages, is installed in its design location in a Seismic Category I structure in a configuration bounded by the [seismic qualification report].</p> <p>[The editions of IEEE 344 and ASME QME-1 and revision to Regulatory Guide 1.100 should be specified in ITAAC Q01 to help support justification for the absence of the need for a Tier 2* item for seismic qualification in the design certification rulemaking.]</p>				

Basis of proposed revision:

The acceptance criteria of NRC-proposed ITAAC Q01 added references to a NRC regulatory guidance documents, IEEE standard and an ASME QME standard. One of the objectives of the NEI SMR industry standardized ITAAC initiative was to prevent ITAAC references to NRC regulatory guides and industry standards to prevent them from being codified. Propose deletion of these references in the ITAAC acceptance criteria. The references are discussed in Tier 2 Section 14.3 Discussion of ITAAC Implementation

In addition, propose the following phrase in Tier 2 Section 14.3 Discussion of ITAAC Implementation be deleted: [The editions of IEEE 344 and ASME QME-1 and revision to Regulatory Guide 1.100 should be specified in ITAAC Q01 to help support justification for the absence of the need for a Tier 2* item for seismic qualification in the design certification rulemaking.] Discussion of ITAAC implementation is designed to provide additional clarity on the intent and verification methods for each ITAAC, but should not contain a discussion of Tier 2*.

This Basis of proposed revision is also applicable to NRC-proposed standardized ITAAC Q06.

<p>Q04</p>	<p>Equipment Qualification and As-Built Inspection Class 1E <u>Computer-Based Instrumentation and Control Systems</u> Digital or Analog Equipment Mild Environment Qualification/ Installation</p>	<p>The [XXX system] Class 1E <u>computer-based instrumentation and control systems</u> equipment located in a mild environment withstands design basis mild environmental conditions without loss of safety- related function.</p>	<p>i. A type test or a combination of type test and analysis will be performed of the [XXX system] Class 1E <u>computer-based instrumentation and control systems</u> equipment located in a mild environment.</p> <p>ii. An inspection will be performed of the [XXX system] Class 1E as-built <u>computer-based instrumentation and control systems</u> equipment located in a mild environment.</p>	<p>i. An [equipment qualification data report] exists and concludes that the [XXX system] Class 1E <u>computer-based instrumentation and control systems</u> equipment listed in [Table x.x.x-x] performs its function under the environmental conditions specified in the [equipment qualification data report].</p> <p>ii. The [XXX system] Class 1E <u>computer-based instrumentation and control systems</u> equipment listed in [Table x.x.x-x] are installed in its design location in a configuration bounded by the equipment's [equipment qualification data report].</p>
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section 3.11 presents information to demonstrate that the Class 1E ~~computer-based instrumentation and control systems equipment~~ located in a mild environment is qualified by type test or a combination of type test and analysis to perform its safety-related function under the design basis mild environmental conditions. The qualification method employed for the equipment is the same as the qualification method described for that type of equipment in Section 3.11.x. This method conforms to IEEE-323-2003 (or later editions), as accepted by the NRC staff in Regulatory Guide 1.209 Revision 0 (or later revision), with specific revision years and numbers as presented in Section 3.10.x.

The ITAAC verifies that: (1) an [equipment qualification data report] exists for the Class 1E ~~computer-based instrumentation and control systems equipment~~ listed in [Tier 1 Table x.x.x-x], and (2) the [equipment qualification data report] concludes that the Class 1E ~~computer-based instrumentation and control systems equipment~~ performs its safety-related function under the design basis mild environmental conditions specified in Section 3.11 and the [equipment qualification data report].

After installation in the plant, an ITAAC inspection is performed of the installation to verify that the Class 1E ~~computer-based instrumentation and control systems equipment~~ listed in [Tier 1 Table x.x.x-x] is installed in its design location in a configuration bounded by the equipment's [equipment qualification data report].

Basis of proposed revision:

The NRC-proposed change to Q04 deleted the term “digital” in the phrase “Class 1E digital equipment” in the ITAAC design commitment, ITA and acceptance criteria as well as the Section 14.3 discussion. This resulted in the scope of ITAAC Q04 increasing to include all Class 1E equipment, not just “digital” equipment in mild environments. Minor correction proposed to add the phrase “computer-based instrumentation and control systems” to replace the word “digital” that was deleted by the NRC. The proposal to replace the word “digital” with the phrase “computer-based instrumentation and control systems” agrees with the language used in Reg Guide 1.209, Guidelines For Environmental Qualification Of Safety-Related Computer-Based Instrumentation And Control Systems In Nuclear Power Plants”.

Q06	Equipment Qualification Safety-Related Valve Functional Qualification	The [XXX system] safety-related valves are functionally designed and qualified to perform their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions [with debris-laden coolant fluids] up to and including design basis accident conditions.	A type test or a combination of type test and analysis will be performed of the [XXX system] safety-related valves.	A [Functional Qualification Report] performed in conformance to ASME QME-1-2007 (or later edition), as accepted in Regulatory Guide 1.100 Revision 3 (or later revision) , exists and concludes that the [XXX system] safety-related valves listed in [Table x.x.x-x] are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions [with debris-laden coolant fluids] up to and including design basis accident conditions.
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

Section 3.9.x discusses that the functional qualification of safety-related valves is performed in accordance with ASME QME-1-2007 (or later edition), as accepted in Regulatory Guide 1.100 Revision 3 (or later revision), with specific revision years and numbers as presented in Section 3.9.x. The qualification method employed for the valves agrees with the qualification method described in Section 3.9.x.

The ITAAC verifies that: (1) An [Functional Qualification Report] exists for the [XXX system] safety-related valves listed in [Tier 1 Table x.x.x-x], and (2) the [Functional Qualification Report] concludes that [XXX system] safety-related valves are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions [with debris-laden coolant fluids] up to and including design basis accident conditions.

~~[The edition of ASME QME-1 and revision to Regulatory Guide 1.100 should be specified in ITAAC Q06 to help support justification for the absence of the need for a Tier 2* item for seismic qualification in the design certification rulemaking.]~~

Basis of proposed revision:

Refer to Basis of proposed revision for NRC-proposed standardized ITAAC Q01.

Q09	Equipment Qualification Safety-Related Heat Exchanger Capacity Qualification	The [XXX system] safety-related heat exchangers have the heat removal capacity to transfer their design heat load.	A <u>type</u> test or a combination of <u>type</u> test and analysis will be performed of the [XXX system] safety-related heat exchangers.	A report exists and concludes that the [XXX system] safety-related heat exchangers listed in [Table x.x.x-x] have a heat removal capacity sufficient to transfer their design heat load.
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

[Section x.x] discusses that the [XXX system] heat exchangers provide the safety-related function of transferring their design heat load from the [XXX system] during [mode of operation]. After manufacture of the [XXX system] heat exchangers, a type test or a combination of type test and analysis is performed to validate that the [XXX system] heat exchangers are capable of meeting the specified heat transfer performance requirements. Section [x.x] provides the design heat transfer capability, UA, i.e., the product of the overall heat transfer coefficient and the effective heat transfer area.

The ITAAC verifies that the safety-related heat exchangers listed in [Tier 1 Table x.x.x-x] have a heat removal capacity sufficient to transfer their design heat load.

Basis of proposed revision:

Propose substitution of the phrase “type test” for the word “test” in the ITA and Section 14.3 discussion. The addition of the phrase “type test” allows the COL to use a type test to qualify safety-related heat exchangers.

R02	As-Built Inspection Radiation Shielding Barriers – Radiation Attenuating Doors	The [YYY structure] 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 and include locking features to prevent unauthorized access and allow unfettered egress.	An inspection will be performed of the as-built [YYY structure] radiation attenuating doors.	i. The [YYY structure] radiation attenuating doors listed in [Table x.x.x-x] 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. ii. The [YYY structure] radiation attenuating doors listed in [Table x.x.x-x] include locking features to prevent unauthorized access and allow unfettered egress.
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section 12.2 and Section 12.3.x provides the design bases for radiation shielding. Radiation shielding is provided to meet the radiation zone and access requirements for normal operation and post-accident conditions and the requirements of 10 CFR 50.49, GDC 4, and GDC 19. Radiation attenuating doors must meet or exceed the radiation attenuation capability of the wall within which they are installed.</p> <p>An ITAAC inspection is performed to verify that the [YYY structure] radiation attenuating doors are installed in their design location in accordance with [Tier 1 Table x.x.x-x] and (1) 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, and (2) contain locking devices to prevent unauthorized access and allow unfettered egress.</p>				
<p>Basis of proposed revision:</p> <p>Part i of the acceptance criteria for NRC-proposed ITAAC R02 requires radiation attenuation doors to be identified in Tier 1 tables or figures. This level of design detail may not be known at the time of DCA submittal. Propose deletion of the reference to tables and figures and addition of a reference to “approved [door schedule] design” in the ITAAC acceptance criteria and Tier 2 Section 14.3 Discussion of ITAAC Implementation.</p> <p>Part ii of the acceptance criteria for NRC-proposed ITAAC R02 requires a verification that radiation attenuation doors are lockable and verification of design attributes of the lock. This level of design detail does not meet ITAAC first principles. For example, locks on radiation doors are not a top-level design features and performance characteristics of the plant, and do not provide reasonable assurance that the constructed facility conforms with NRC regulations related to design and performance of safety functions. Propose deletion of part ii of the acceptance criteria.</p>				
R06	Preoperational Test [XXX system] Automatic Isolation /Alignment test	The [XXX system] automatically respond(s) to mitigate the release of radioactivity.	A test , using a test source, will be performed of the [XXX system] <u>high radiation signals.</u>	<u>Upon initiation of a real or simulated [XXX system] high radiation signal</u> For each radiation monitor listed in [Table x.x.x-x], the [XXX system] automatically aligns/actuates the identified component(s) to the position(s) identified in the table, when the associated radiation monitor listed in the table detects a radioactivity level exceeding its trip set point.

<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>[Section x.x] discusses the operation of the [XXX system]. For each radiation monitor<u>high radiation signal</u> listed in [Tier 1 Table x.x.x-x], the [XXX system] automatically aligns the component(s) identified in [Tier 1 Table x.x.x-x] to the required position(s) identified in the table. In accordance with Section 14.2.x, a preoperational test demonstrates the [XXX system] automatically aligns the component(s) identified in [Tier 1 Table x.x.x-x] to the required position(s) identified in the table <u>upon initiation of a real or simulated [XXX system] high radiation signal</u>when the associated radiation monitor detects a radioactivity level exceeding its trip set point established for the test. A low activity test or calibration source should be used to cause a radiation response above the minimum level needed to actuate the instrument trip set point established for the test.</p>				
<p>Basis of proposed revision:</p> <p>NRC-proposed standardized ITAAC R06 and the associated Tier 2 Section 14.3 Discussion of ITAAC Implementation requires that a test source be used to actuate each radiation monitor to generate a high radiation signal. The proposed revision will allow ITAAC R06 to use a real or simulated signal as allowed by other NRC-proposed ITAAC, such as E11, E22, I09, I15, and I22.</p>				
R07	<p>As-Built Inspection and Reconciliation Analysis [XXX system] [RW-XX] Equipment.</p>	<p>The [XXX system] non-Seismic Category I [RW-XX] equipment, constructed to the standards of RG 1.143, will withstand design loads without loss of structural integrity.</p>	<p>An inspection and reconciliation analysis will be performed of the as-built [XXX system] non-Seismic Category I [RW-XX] equipment.</p>	<p>The deviations between the drawings used for construction and the as-built [RW-XX] equipment listed in [Table x.x.x-x] have been reconciled and the [XXX system] non-Seismic Category I [RW-XX] equipment will maintain its structural integrity under designs loads</p>
	<p>Tier 2 Section 14.3 Discussion</p> <p>[Section XX] provides a discussion of the [XXX system], which is non-Seismic Category I [RW-XX] and is designed and constructed to the standards of RG 1.143 to withstand the design loads without loss of structural integrity. RG 1.143 Table 1 “Codes and Standards for the Design of SSC in Radwaste Facilities,” describes the design codes and standards expected to be met to demonstrate that the health and safety of members of the public and workers at the facility will be protected for the operational conditions described within RG 1.143 Table 2 “Natural Phenomena and Internal/External Man-Induced Hazard Design Criteria for Safety Classification” and Table 3 “Design Load Combinations.”</p> <p>[The design should specify which structures are designed to meet the criteria specified in RG 1.143, including the associated RW classification.]</p> <p>An ITAAC inspection and reconciliation analysis is performed for the [XXX system] non-Seismic Category I [RW-XX] equipment to verify that the equipment will maintain its structural integrity under designs loads.</p>			

<p>Basis of proposed revision: The NRC-proposed standardized ITAAC R07 acceptance criteria requires that a reconciliation analysis be performed of SSC designed and constructed to RG 1.143, Revision 2. As stated in RG 1.143, Revision 2, Regulatory Position 7, Quality Assurance For Radwaste Management Systems: “Since the impact of these systems on safety is limited, the extent of control required by Appendix B to 10 CFR Part 50 is similarly limited.” and “The design, procurement, fabrication, and construction activities should conform to the quality control provisions of the codes and standards specified in Table 1 of this guide.” The codes and standards listed in RG 1.143, Revision 2, Table 1, Codes and Standards for the Design of SSC in Radwaste Facilities, do not require a reconciliation analysis to be performed of as-built non-Seismic Category I radwaste equipment designed in accordance with the code or standard. The language provided by RG 1.143, Revision 2 and its associated codes and standards provides a basis to conclude that the design commitment of NRC-proposed ITAAC R07 does not satisfy the ITAAC first principle that the ITAAC design commitment should describe a top-level design feature and performance characteristic of the plant. NuScale does not propose to submit ITAAC R07 for DCA</p>				
R08	<p>Design Analysis Primary to Secondary Leakage Detection {PWR Plants Only}</p>	<p>The [XXX system] monitors for primary to secondary leakage to provide early indication of a potential steam generator tube leak.</p>	<p>An analysis will be performed to verify the as-built [XXX system] can detect a primary to secondary leak rate equal to [### gallons per day].</p>	<p>The [XXX system] detects a primary to secondary leak rate equal to [### gallons per day].</p>
	<p>Tier 2 Section 14.3 Discussion [Section XX] discusses the primary to secondary leakage detection radiation monitoring instrumentation and its compliance with the “Operational Leakage,” detection criteria provided in NEI 97-06 and its referenced EPRI guidelines. The analysis demonstrates that with normally expected values of reactor coolant activity, maximum expected condenser air in leakage, loop transit times and radiation detection instrument background conditions, that the leakage detection criteria outlined in EPRI “PWR Primary-to-Secondary Leak Guidelines”, are met for the credited radiation monitoring system(s) to provide for rapid detection and response to indicated steam generator tube leakage.</p>			
<p>Basis of proposed revision: The design commitment for NRC-proposed standardized ITAAC R08 indicates that the ITAAC will verify the design for “early indication of a potential steam generator tube leak.” which is an early detection of reactor coolant pressure leakage. This design commitment and therefore the ITAAC do not meet ITAAC first principles. For example, the non-safety-related function of early indication of a potential steam generator tube leak does not describe a top-level design feature or performance characteristics of the plant. In addition, a graded approach to ITAAC is met by ITAAC M25, M26 and M27 which verify the design that allows detection of reactor coolant t pressure boundary leakage. NuScale does not propose to submit ITAAC R08 for DCA.</p>				

S01	As-Built Analysis and As-Built Inspection Seismic Category I Structure	The [YYY structure or containment internal structures] 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 [YYY structure or containment internal structures]. ii. An inspection will be performed of the as-built [YYY structure or containment internal structures].	i. A design report exists and concludes that the deviations between the drawings used for construction and the as-built [YYY structure or containment internal structures] have been reconciled, and the [YYY structure or containment internal structures] maintains its structural integrity under the design basis loads. ii. The dimensions of the [YYY structure or containment internal structures] critical sections conform to <u>the approved design requirements identified in [Figure(s) x.x.x-x or Table(s) x.x.x-x]</u> .
<p>Tier 2 Section 14.3 Discussion of ITAAC Implementation</p> <p>Section 3.8.x provides descriptive information, including plans and sections of each Seismic Category I structure, to establish that there is sufficient information to define the primary structural aspects and elements relied upon for the structure to perform the intended safety functions. <u>Critical dimensions are identified in [Figure(s) x.x.x-x or Table(s) x.x.x-x]</u>. The [YYY structure or containment internal structures] and its design basis loads are discussed in Section 3.8.x. Critical sections are the subcomponents of individual Seismic Category I structures (i.e., shear walls, floor slabs and roofs, structure-to-structure connections) that are analytically representative of an essentially complete design. Design basis loads are:</p> <ul style="list-style-type: none"> • Normal plant operation (e.g., dead loads, live loads, lateral earth pressure loads, equipment loads, hydrostatic loads, hydrodynamic loads, and temperature loads). • Internal events (e.g., internal flood loads, accident pressure loads, accident thermal loads, pipe break loads, including reaction loads, jet impingement loads, cubicle pressurization loads, and missile impact loads). • External events (e.g., wind, extreme winds, rain, snow, flood, extreme winds-generated missiles and earthquake). <p>Guidance for the content and structure of the design report is provided in Standard Review Plan (SRP) Section 3.8.4, Appendix C.</p> <p>An ITAAC inspection and analysis is performed of the as-built [YYY structure or containment internal structures] to ensure that deviations between the drawings used for construction and the as-built [YYY structure or containment internal structures] are reconciled and the [YYY structure or containment internal structures] maintains its structural integrity under the design basis loads. The design report provides criteria for the reconciliation between design and as-built conditions.</p> <p>An ITAAC inspection is performed of the as-built [YYY structure or containment internal structures] to verify that the dimensions of the [YYY structure or containment internal structures] critical sections conform to <u>approved design requirements identified in [Tier 1 Figure(s) x.x.x-x or Table(s) x.x.x-x]</u>.</p>				

Basis of proposed revision:

The acceptance criteria for NRC-proposed ITAAC S01 require dimensions of critical sections to be identified in Tier 1 tables or figures. This volume and level of design detail may require some revision during plant construction. Propose deletion of the reference to tables and figures in the ITAAC acceptance criteria and addition of a reference to “approved design” in both the ITAAC acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation**. This will allow revisions to dimensions using a 50.59-like change process rather than a change to regulation.

S09	As-Built Analysis and As-Built Inspection Radwaste Category [RW-XX] Structure	The [YYY structure] is a non-Seismic Category I [RW-XX] structure and maintains its structural integrity under the design basis loads as provided in RG 1.143 .	An inspection and reconciliation -analysis will be performed of the as-built [RW-XX] [YYY structure].	A reconciliation design report exists and concludes that the deviations between the drawings used for construction and the as-built [RW-XX] [YYY structure] have been reconciled and that the as-built [RW-XX] [YYY structure] maintains its structural integrity under the design basis loads.
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Tier 2 Section 14.3 Discussion of ITAAC Implementation

The [RW-XX] [YYY structure] and its design basis loads are discussed in Section 3.8.x. Guidance for the content and structure of the as-built design report is provided in Standard Review Plan (SRP) Section 3.8.4, Appendix C.

The scope of this ITAAC is a reconciliation of deviations between the issued for construction drawings that implement the seismic and dynamic analyses and the as-built structures. The design report provides criteria for the reconciliation. Design basis loads as listed in RG 1.143 are:

- Earthquake
- Wind
- [Tornado ~~and Hurricane~~]
- [Tornado ~~and Hurricane Missile~~]
- Flood
- Precipitation (Rain, Snow)
- [Accidental Explosion (Fixed Facility)]
- [Accidental Explosion (Transportation Vehicle)]
- [Malevolent Vehicle Assault]
- [Small Aircraft Crash]

An ITAAC inspection and ~~reconciliation~~-analysis is performed of the as-built [RW-XX] [YYY structure] to ensure that deviations between the drawings used for construction and the as-built [RW-XX] [YYY structure] are reconciled and the as-built [RW-XX] [YYY structure] maintains its structural integrity under the design basis loads. The design report provides criteria for the reconciliation between design and as-built conditions.

Basis of proposed revision:

The design commitment of NRC-proposed ITAAC S09 added references to a NRC regulatory guidance document RG 1.143. One of the objectives of the NEI SMR industry standardized ITAAC initiative was to prevent ITAAC references to NRC regulatory guides to prevent them from being codified. Propose deletion of the reference to RG 1.143 in the ITAAC design commitment. RG 1.143 is discussed in Tier 2 Section 14.3 Discussion of ITAAC Implementation.

Two additional minor changes are proposed: (1) Delete the word “reconciliation” in the ITAAC S09 ITA, acceptance criteria and **Tier 2 Section 14.3 Discussion of ITAAC Implementation**. This use of the word “reconciliation” has not been used in any other ITAAC when referring to an analysis or a report. (2) Delete reference to “hurricane” in the Tier 2 Section 14.3 Discussion of ITAAC Implementation. The word “hurricane” is not used in RG 1.143.