Hxx – Human Factors Engineering ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">H01</td><td><u>Design Analysis</u>
Human Factors Engineering/Main Control Room Design</td><td>The Control Room design incorporates human factors engineering principles that minimize the potential for operator error.</td><td>An Integrated System Validation (ISV) test will be performed in accordance with the Verification and Validation Implementation Plan.</td><td>An Integrated System Validation Report exists and concludes that acceptance criteria associated with each test scenario are satisfied upon initial performance of the scenarios or upon remediation of failures.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Section 18.x describes the Integrated System Validation (ISV), which provides a comprehensive performance-based assessment of the design of the Human-System Interface (HSI) resources, based on their realistic operation within a simulator-driven main control room (MCR). The ISV is part of the overall Human Factors Engineering (HFE) program.
An ISV test is performed in accordance with the Verification and Validation Implementation Plan. The ISV uses a representative set of scenarios to assess the usability of the MCR and HSI resources and the tolerance of or susceptibility to error. The acceptance criteria associated with each test scenario are satisfied upon initial performance of the scenarios or upon remediation of failures.</td></tr>
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<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">H0
2</td><td><u>As-built Inspection</u>
Human Factors Engineering/Main Control Room</td><td>The as-built Control Room human-system interface is consistent with the final design specifications validated by the Integrated System Validation test.</td><td>An inspection will be performed of the as-built configuration of main control room Human System Interfaces.</td><td>The as-built configuration of main control room Human System Interfaces is consistent with the as-designed configuration of main control room Human System Interfaces as modified by the Integrated System Validation Report.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Section 18.x describes the implementation of HFE aspects of the plant design. An ITAAC inspection is performed to verify that the as-built configuration of main control room Human System Interfaces is consistent with the as-designed configuration of main control room Human System Interfaces as modified by the Integrated System Validation Report.</td></tr>
</table>

Dxx – Design Reliability Assurance Program ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
D01	**As-Designed Analysis** Design Reliability Assurance Program	The structures, systems, and components (SSCs) within the scope of the reliability assurance program (RAP) at licensing are designed in a manner that is consistent with the risk insights and key assumptions of the licensed design.	An analysis will be performed to verify that the initial design of every SSC within the scope of the RAP at licensing has been completed in accordance with the design reliability assurance program (D-RAP).	Procurement and construction documents for each SSC within the scope of the RAP at licensing have been issued by the licensee's design organization.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
D01	**<u>Tier 2 Section 14.3 Discussion</u>** Section 17.4 discusses the reliability assurance program, which assures that the risk-significant components (identified in Table 17.4-x) are designed, procured, constructed, and operated in a manner that is consistent with the key assumptions and risk insights for risk-significant SSCs. The SSC may be either safety-related or nonsafety-related. Safety-related, risk-significant components are designed with the quality program requirements of 10 CFR Part 50 Appendix B as defined in [Topical Report X]. [Topical Report Y] defines requirements for nonsafety-related, risk-significant components. These licensee programs assure that risk insights and key assumptions of the licensed design are properly translated into more detailed design documents. The D-RAP ITAAC does not analyze the effectiveness of these programs; that is addressed in other reviews and inspections. The D-RAP ITAAC verifies that appropriate controls have been applied to the procurement and construction documents prepared for each risk-significant SSC. It is sufficient to confirm that the initial version of each document has been issued under the appropriate program. (This is because revisions to these documents can only be performed under the same programs.) For this reason, while the ITAAC may be closed on the basis of revised packages (in place of the original), closure of the ITAAC is not to be delayed just because revisions are planned or anticipated. The scope of the D-RAP ITAAC is fixed at the time the license is issued. This is because additions to the scope of RAP can only be made through the appropriate control program; the addition of an SSC demonstrates that the appropriate program has been applied. Similarly, SSCs can be removed from the scope of RAP, but only through the appropriate control programs. In the context of the D-RAP ITAAC, the engineering package that removes an SSC from the scope of RAP constitutes “completed design” for that SSC. The required analysis is focused on completeness: ensuring that the initial design related to each SSC in the scope of RAP when the license is issued has been developed under the appropriate programs. It is advantageous to attempt to close the D-RAP ITAAC early in the COL design phase. This maximizes the time available to correct any omission and minimizes any associated schedule impact. Once closed, the ITAAC should not be reopened because of revisions to procurement or construction documents or even modification to the design. Such changes can only be accomplished through the appropriate design control programs. An ITAAC analysis is performed to verify the following: i. The documents for procurement and construction of each safety-related, risk-significant SSC listed in Table 17.4-x at the time of licensing have been approved, demonstrating that each document was developed in accordance with the 10 CFR Part 50 Appendix B quality program requirements listed in [Topical Report X]. ii. The documents for procurement and construction of each nonsafety-related, risk-significant SSC listed in Table 17.4-x at the time of licensing have been approved, demonstrating that each document was developed in accordance with applicable requirements listed in [Topical Report Y].			

Bxx – Backfill ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
B01	**As-built Testing** Backfill material under Seismic Category 1 Structures	Backfill material under and adjacent to [YYY Seismic Category 1 structure(s)] is installed to meet a minimum of 95 percent Modified Proctor compaction density.	Tests will be performed during as-built placement of the backfill materials.	The backfill material placed under and adjacent to the [YYY Seismic Category 1 structure(s)] meets the minimum 95 percent Modified Proctor Compaction.
	Tier 2 Section 14.3 Discussion Tier 2 Section 2.5.4.5 discusses, in part, the excavations, backfill and earthwork analyses needed to meet the requirements of 10 CFR Part 50. The object of this ITAAC is to ensure reliable performance of the foundation bearing material over the life of the plant. Specifically, If backfill is to be placed under safety-related structures, proper ITAAC should be specified in the applicant's technical submittal to ensure that the static and dynamic properties of in-place backfill material will be the same as, or better than the design parameters**.** Similarly, if needed, ITAAC also includes backfill surrounding Seismic Category 1 structures depending on treatment in Soil Structure Calculations (SSI). The frequency of testing shall be site specific and is dependent of complexity of the task. This should be described in pertinent section/s of the FSAR. By specifying the expected compaction specifications of backfill material, this ITAAC provides one way to confirm that the aforementioned static and dynamic properties of said backfill are met prior to the construction of the Seismic Category 1 structure.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
B02	**<u>As-built Testing</u>** Backfill material under Seismic Category 1 Structures	Backfill shear wave velocity underneath and adjacent to the [YYY Seismic Category 1 structure(s)] is greater than or equal to the design shear wave velocity.	Tests will be performed to determine the as-built field shear wave velocity, at a minimum, when backfill placement is at the following: The Bottom of the [YYY Seismic Category 1 structure's] foundation depth. A minimum of 5 spatially distributed measurements is to be conducted under the footprint of the foundation. Finish grade adjacent to the embedded [Seismic Category 1 structure(s)]. A minimum of 5 spatially distributed measurements is to be conducted along the perimeter of the structure(s).	The backfill shear wave velocity underneath and adjacent to the [YYY Seismic Category 1 structure(s)] is greater than or equal to the design shear wave velocity of [XXXX, fps or m/s].
	<u>Tier 2 Section 14.3 Discussion</u> Section 2.5.4.5 discusses, in part, the excavations, backfill and earthwork analyses needed to meet the requirements of 10 CFR Part 50. The object of this ITAAC is to ensure reliable performance of the foundation bearing material over the life of the plant. Specifically, If backfill greater than 5 feet thick, as specified in SRP 2.5.4, is to be placed under safety-related structures, proper ITAAC should be specified in the applicant's technical submittal to ensure that the static and dynamic properties of in-place backfill material will be the same as, or better than the design parameters. Shear wave velocity measurements shall take into consideration the spatial variability of the backfill material under the footprint of the foundation. By specifying the expected dynamic properties of backfill material by way of in situ shear modulus testing, this ITAAC provides one way to confirm that the aforementioned dynamic properties of said backfill are met prior to the construction of the Seismic Category 1 structure.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
B03	**As-built Testing** Cementitious construction material under Seismic Category 1 Structures	Fill concrete placed under [YYY Seismic Category I Structure(s),] is designed and tested to ensure that the static and dynamic properties of the material will be the same as or better than the specified design parameters.	Tests will be performed to determine the static and/or dynamic properties of the as-built fill concrete.	The fill concrete is equal to, or greater than, [design value(s)] as specified in application].
	Tier 2 Section 14.3 Discussion Section 2.5.4.5 discusses, in part, the excavations, backfill (including cementitious construction material) and earthwork analyses needed to meet the requirements of 10 CFR Part 50. The object of this ITAAC is to ensure reliable performance of the foundation bearing material over the life of the plant. Specifically, If cementitious construction material, greater than 5 feet thick as specified in SRP 2.5.4, is to be placed under safety-related structures, proper ITAAC should be specified in the applicant's technical submittal to ensure that the static and dynamic properties of the material will be the same as, or better than the design parameters. In general, by testing the expected 28-day mean compressive strength of cementitious construction material, this ITAAC provides one way to confirm that the properties (static, and dynamic) of said material are met prior to the construction of the Seismic Category 1 structure.			

Axx - Piping ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A01	**<u>Design Acceptance Criteria</u>** ASME 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 retains its pressure boundary integrity [and functional capability] under internal design and operating pressures and design basis loads.	An inspection of the ASME Code Section III Design Report (NCA-3550) will be performed. {{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 design requirements of ASME Code Section III Division 1 and will retain its pressure boundary integrity [and functional capability] under internal design and operating pressures and design basis loads. {{DAC}}
	<u>Tier 2 Section 14.3 Discussion</u> As required by ASME Code Section III NCA-1210, each ASME Code Class 1, 2 and 3 component (including piping systems) of a nuclear power plant requires a Design Report in accordance with NCA-3550. [Where the ASME BPV Code of record is before the 1992 Edition with 1994 Addenda or after the 2004 Edition with 2005 Addenda, the Level D stress limits in the ASME BPV Code are considered sufficient to ensure piping functional capability consistent with NUREG-1367.] An ITAAC inspection is performed of the [XXX system] as-designed ASME Code Class [1, 2 and/or 3] piping system Design Report (NCA-3550) to verify that the piping design meets the loading and stress requirements of ASME Code Section III Division 1 and will retain its pressure boundary integrity [and functional capability] under internal design and operating pressures and design basis loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A02	**<u>As-Built Inspection and Reconciliation Analysis</u>** ASME Section III Piping System Design Report (As-Built Design Reconciliation)	The [XXX system] ASME Code Class [1, 2 and/or 3] piping system is reconciled with the ASME Code Section III Design Report for the as-designed piping system.	An inspection and reconciliation analysis will be performed of the [XXX system] ASME Code Class [1, 2 and/or 3] as-built piping system.	The deviations between the drawings used for construction and the [XXX system] ASME Code Class [1, 2, and/or 3] as-built piping system have been reconciled, and the ASME Code Section III Design Report (NCA-3550) for the as-built piping system exists and concludes that the ASME Code Section III, Division 1 design requirements are met.
	<u>Tier 2 Section 14.3 Discussion</u> As required by ASME Code Section III NCA-1210, each ASME Code Class 1, 2 and 3 component (including piping systems) of a nuclear power plant requires a Design Report in accordance with NCA-3550. NCA-3551.1 requires that the drawings used for construction be in agreement with the Design Report before it is certified and be identified and described in the Design Report. It is the responsibility of the N Certificate Holder to furnish a Design Report for each component and support, except as provided in NCA-3551.2 and NCA-3551.3. NCA-3551.1 also requires that the Design Report be certified by a Registered Professional Engineer when it is for Class 1 components and supports, Class CS core support structures, Class MC vessels and supports, Class 2 vessels designed to NC-3200 (NC-3131.1), or Class 2 or Class 3 components designed to Service Loadings greater than Design Loadings. A Class 2 Design Report shall be prepared for Class 1 piping NPS 1 or smaller which is designed in accordance with the rules of Subsection NC. An ITAAC inspection and reconciliation analysis is performed of the [XXX system] ASME Code Class [1, 2 and/or 3] as-built piping system and Design Report to verify that the piping system and report meet the requirements of ASME Section III Division 1.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A03	**<u>As-Built Inspection</u>** ASME Section III Code Class 1, 2, and 3 Piping Systems Functional Capability Report *{This ITAAC is for design certifications for which the ASME BPV 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 C and Level D condition loads without a loss of functional capability.	An inspection and analysis will be performed to verify that the as-built [XXX system] piping maintains functional capability in Level C and Level D conditions.	Each of the as-built lines identified in [Table x.x.x-x] maintains functional capability in Level C and Level D conditions.
	<u>Tier 2 Section 14.3 Discussion</u> This ITAAC applies to ASME piping systems that must maintain an adequate fluid flow path to mitigate a Level C or Level D plant event and the ASME BPV Code of record is the 1992 Edition with 1994 Addenda through the 2004 Edition with 2005 Addenda. For ASME BPV Codes in this time span, the Level D stress limits in the ASME BPV Code are not considered sufficient to ensure piping functional capability consistent with NUREG-1367, "Functional Capability of Piping Systems," dated November 1992. Specific verification tasks to ensure piping functional capability are suggested in Section 9.1 of NUREG-1367. This ITAAC verifies the functional capability of appropriate piping systems, as described further in NUREG-1367.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A04	**As-Built Inspection** ASME Section III Code Class 1, 2 and 3 Data Reports	The [XXX system] ASME Code Class [1, 2 and/or 3] components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the ASME Code Section III documentation for the as-built [XXX system] ASME Code Class [1, 2 and/or 3] components.	ASME Code Section III Data Reports for the [XXX system] ASME Code Class [1, 2 and/or 3] components listed in [Table x.x.x-x] and interconnecting piping exist and conclude that the requirements of ASME Code Section III, Division 1 are met.
	Tier 2 Section 14.3 Discussion The ASME Code Section III requires that documentary evidence be available at the construction or installation site before use or installation to ensure that ASME Code Class 1, 2 and 3 components conform to the requirements of the Code. As defined in NCA-9000, a component can be a vessel, pump, pressure relief valve, line valve, storage tank, piping system, or core support structure that is designed, constructed, and stamped in accordance with the rules of Section III. The [XXX system] ASME Code Class [1, 2 and/or 3] components require a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified by NCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is specified in Table NCA-8100-1. An ITAAC inspection is performed of the as-built Data Reports for [XXX system] ASME Code Class [1, 2 and/or 3] components and interconnecting piping that is described in Section XX to (1) ensure that the appropriate Data Reports have been provided as specified in Table NCA-8100-1, (2) ensure that the Certificate Holder or Owner and the Authorized Nuclear Inspector (ANI) have signed the Data Reports, and (3) verify the requirements of ASME Code Section III, Division 1 are met.			

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<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">A05</td><td><u>As-Built Inspection</u>
ASME Section III Code Class CS Data Reports</td><td>The ASME Code Class CS components conform to the rules of construction of ASME Code Section III.</td><td>An inspection will be performed of the ASME Code Section III component documentation for the as-built ASME Code Class CS components.</td><td>ASME Code Section III Data Reports for the ASME Code Class CS components listed in [Table x.x.x-x] exist and conclude that the requirements of ASME Code Section III Division 1 are met.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
The ASME Code Section III requires that documentary evidence be available at the construction or installation site before use or installation to ensure that ASME Code CS components conform to the requirements of the Code. The ASME Code Class CS components require a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified by NCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is identified in Table NCA-8100-1.
An ITAAC inspection is performed of the as-built Data Reports for the ASME Code Class CS components to (1) ensure that the appropriate Data Reports have been provided as specified in Table NCA-8100-1, (2) ensure that the Certificate Holder or Owner and the Inspector have signed the Data Reports and (3) verify the requirements of ASME Code Section III, Division 1 are met.</td></tr>
</table>

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A06	**<u>Design Acceptance Criteria</u>** Pipe Break Hazards Analysis Report (As-Designed) {{DAC}} *(If DAC use approved)*	Safety-related [and RTNSS] SSCs are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	A pipe break hazards analysis will be performed to evaluate the effects of postulated failures in high- and moderate-energy piping systems on the nearby safety-related [and RTNSS] SSCs. [Note: Protection against dynamic effects is not required for high-energy, ASME Class 1 and 2 piping and interconnected equipment nozzles for which LBB criteria is considered applicable.] {{DAC}}	A Pipe Break Hazards Analysis Report exists and concludes that the as-designed safety-related [and RTNSS] SSCs will be protected against: 1. the dynamic effects (pipe whip and jet impingement) associated with postulated failures in high-energy piping systems, and 2. the environmental effects (pressurization of compartments, water spray, and flooding) associated with postulated failures in high- and moderate-energy piping systems. {{DAC}}
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.6.x discusses that a pipe rupture hazard analysis is prepared based on the as-designed piping stress analyses and pipe whip restraint design information. The as-designed analysis is based on piping routings, layouts, and isometrics. An ITAAC analysis of the as-designed Pipe Break Hazards Analysis Report will be performed to: 1. Confirm that the as-designed safety-related [and RTNSS] SSCs are protected against the dynamic effects (pipe whip and jet impingement) associated with postulated failures in high-energy piping systems. 2. Confirm that the as-designed safety-related [and RTNSS] SSCs are protected against the environmental effects (pressurization of compartments, water spray, and flooding) associated with postulated failures in high- and moderate-energy piping systems. [Note: Protection against dynamic effects is not required for high-energy, ASME Class 1 and 2 piping and interconnected equipment nozzles for which LBB criteria is considered applicable.]			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A07	**<u>As-Built Inspection and Reconciliation Analysis</u>** Pipe Break Hazards Analysis Design Reconciliation and Protective Features Verification	Safety-related [and RTNSS] SSCs are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	An inspection and reconciliation analysis will be performed of the as-built high- and moderate-energy piping systems and protective features for the safety-related [and RTNSS] SSCs. [Note: Protection against dynamic effects is not required for high-energy, ASME Code Class 1 and 2 piping and interconnected equipment nozzles determined to meet LBB criteria.]	The deviations between the as-designed Pipe Break Hazards Analysis report and the as-built high- and moderate-energy piping systems and protective features for the safety-related [and RTNSS] SSCs have been reconciled, and 1. the protective features for the as-built safety-related [and RTNSS] SSCs are installed in accordance with the as-built Pipe Break Hazard Analysis Report, and 2. the as-built safety-related [and RTNSS] SSCs are protected against or qualified to withstand the dynamic effects associated with postulated failures in as-built high energy piping, and 3. the as-built safety-related [and RTNSS] SSCs are protected against or qualified to withstand the environmental effects associated with postulated failures in as-built high- and moderate-energy piping.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.6.x provides the design bases and criteria for the analysis required to demonstrate that safety-related [and RTNSS] SSCs are not impacted by the adverse effects of a high- and moderate-energy pipe failure within the plant. Table 3.6-x lists the rooms that contain both high-energy pipe break locations and essential SSCs that must be protected. An ITAAC inspection and reconciliation analysis is performed to verify: (1) that the changes to postulated pipe failure locations and protective features or protected equipment made during construction do not adversely affect the safety-related [and RTNSS] functions of the protected equipment and (2) as-built protective features credited in the reconciled Pipe Break Hazards Analysis Report such as pipe whip restraints, pipe whip or jet impingement barriers, jet impingement shields, or guard pipe have been installed in accordance with design drawings of sufficient detail to show the existence and location of the protective hardware. Note: Protection against dynamic effects is not required for high-energy ASME Code Class 1 and 2 piping and interconnected equipment nozzles determined to meet LBB criteria.			

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<tr><td rowspan="2">A08</td><td><u>Design Analysis</u>
Leak Before Break (LBB) Analysis (As-Built)</td><td>The ASME Code Class 1 and 2 piping listed in [Table x.x.x-x] and the interconnected equipment nozzles are evaluated for leak-before-break (LBB).</td><td>An analysis will be performed of the as-built ASME Code Class 1 and 2 piping listed in [Table x.x.x-x] and the interconnected equipment nozzles.</td><td>The LBB analysis for the ASME Code Class 1 and 2 piping listed in [Table x.x.x-x] and the interconnected equipment nozzles is bounded by the as-designed LBB analysis.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Section 3.6.X describes the application of the mechanistic pipe break criteria, commonly referred to as leak-before-break (LBB), to the evaluation of pipe ruptures. The leak-before-break analysis eliminates the need to consider the dynamic effects of postulated pipe breaks for high-energy piping that qualify for LBB.
An as-built ITAAC analysis which includes material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms is performed to verify that the as-designed LBB analysis is bounding for the as-built ASME Code Class 1 and 2 piping and interconnected equipment nozzles. A summary of the results of the plant specific LBB analysis, including material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms is provided in the as-built LBB analysis report.</td></tr>
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<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">A09</td><td><u>Vendor Test</u>
Reactor Vessel Charpy Upper-Shelf Energy requirements 10 CFR Part 50, Appendix G</td><td>The reactor pressure vessel (RPV) beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.</td><td>A vendor test of the Charpy V-Notch specimen of the RPV beltline material will be performed.</td><td>An ASME Code Certified Material Test Report (CMTR) exists and concludes that the initial RPV beltline Charpy upper-shelf energy is no less than 75 ft-lb.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Section 5.3.X discusses the fracture toughness properties of the reactor pressure vessel (RPV) beltline material and the Material Surveillance Program.
A Charpy V-Notch test of the RPV beltline material specimen is performed by the vendor to ensure that the initial RPV beltline Charpy upper-shelf energy is no less than 75 ft-lb.</td></tr>
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Qxx – Qualification ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q01	**<u>Equipment Qualification</u>** Safety-Related Mechanical, Electrical, and Instrumentation & Control Equipment Seismic Category I Qualification/Installation	The [XXX system] Seismic Category I safety-related equipment, including its associated supports and anchorages, can withstand design basis seismic loads without loss of its safety-related function(s) during and after a safe-shutdown earthquake (SSE).	i. Type test, analysis, or a combination of type test and analysis, will be performed to qualify the [XXX system] Seismic Category I safety-related equipment, including its associated supports and anchorages. ii. An inspection will be performed of the [XXX system] as-built Seismic Category I safety-related equipment, including its associated supports and anchorages.	i. A [seismic qualification report(s)] exists and concludes that the [XXX system] Seismic Category I safety-related 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-related function(s) during and after an SSE. ii. The [XXX system] Seismic Category I safety-related 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 manner bounded by the equipment's [seismic qualification report].
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.10 presents information to demonstrate that the Seismic Category I safety-related mechanical, electrical, and instrumentation & control 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-related function(s) 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. The ITAAC verifies that: (1) a seismic qualification report(s) exists for each Seismic Category I safety-related component, and (2) the seismic qualification report(s) conclude that the Seismic Category I safety-related equipment, including its associated supports and anchorages, can perform its safety-related function(s) under the seismic design basis load conditions specified in the seismic qualification report(s). After installation in the plant, an inspection is performed to verify that the Seismic Category I safety-related equipment is installed in a Seismic Category 1 Structure in its design location in a manner bounded by the seismic qualification report.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q02	**<u>Equipment Qualification</u>** [Class 1E or RTNSS] Electrical Equipment Harsh Environment Qualification/Installation (10 CFR Part 50.49)	The [XXX system] **[**Class 1E or RTNSS] electrical equipment located in a harsh environment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies) will withstand the design basis harsh environmental conditions experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions and perform its [important to safety or RTNSS] function(s) for the period of time required to complete the function(s).	i. Type tests or a combination of type tests and analysis will be performed to qualify the [XXX system] **[**Class 1E or RTNSS] electrical equipment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies) for the design basis harsh environmental conditions. ii An inspection will be performed of the [XXX system] as-built **[**Class 1E or RTNSS] electrical equipment qualified for a harsh environment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies).	i. [Equipment qualification data reports] exist and conclude that the [XXX system] electrical equipment listed in [Table x.x.x-x] and located in a harsh environment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies) will withstand the design basis harsh environmental conditions experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions and perform its [important to safety or RTNSS] function(s) for the period of time required to complete the function(s). ii. The electrical equipment listed in [Table x.x.x-x] qualified for harsh environment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies) is installed in its design location and is bounded by its [equipment qualification data report].

Q02	**<u>Tier 2 Section 14.3 Discussion</u>** For electrical equipment, Section 3.11 presents information to demonstrate that the [Class 1E or RTNSS] electrical equipment (including the associated wiring, cables, terminations, connectors, and environmental seals in combination with related cables or wires as assemblies) located in a harsh environment is qualified using a type test or a combination of type test and analysis to perform its [important to safety or RTNSS] function(s) under design basis harsh environmental conditions, experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions in accordance with 10 CFR 50.49. 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. The ITAAC verifies that: (1) [equipment qualification data reports] exist for the electrical equipment designated for harsh environment and addresses connection assemblies (such as connectors, terminations, and environmental seals in combination with related cables or wires as assemblies), (2) the equipment qualification data reports conclude that the electrical equipment, including its connection assemblies, can perform its [important to safety or RTNSS] function(s) under the design basis harsh environmental conditions specified in Section 3.11 and the equipment qualification data report(s), and (3) the required post-accident operability time for the equipment in the qualification data report(s) is in agreement with Section 3.11.x. After installation in the plant, an inspection is performed to verify that the electrical equipment designated for harsh environment is installed in its design location and is bounded by the environmental qualification data report.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q03	**<u>Equipment Qualification</u>** [Safety-Related or RTNSS] Mechanical Equipment Harsh Environment Qualification	The non-metallic parts, materials, and lubricants used in [safety-related or RTNSS] mechanical equipment can perform their [safety-related or RTNSS] function(s) up to the end of their qualified life in the design basis harsh environmental conditions (both internal service conditions and external environmental conditions) experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions..	A type test or a combination of type test and analysis will be performed of the [XXX system] non-metallic parts, materials, and lubricants used in [safety-related or RTNSS] mechanical equipment.	A qualification report exists and concludes that the non-metallic parts, materials, and lubricants used in mechanical equipment listed in [Table x.x.x-x] can perform their [safety-related or RTNSS] function(s) up to the end of the equipment's qualified life under the design basis harsh environmental conditions (both internal service conditions and external environmental conditions) experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions.
	<u>Tier 2 Section 14.3 Discussion</u> For mechanical equipment, Section 3.11 presents information to demonstrate that the non-metallic parts, materials, and lubricants used in [safety-related or RTNSS] mechanical equipment located in a harsh environment is qualified using a type test or a combination of type test and analysis to perform their [safety-related or RTNSS] function(s) up to the end of their qualified life in design basis harsh environmental conditions experienced during normal operations, anticipated operational occurrences, design-basis accidents, and post-accident conditions. Environmental conditions include both internal service conditions and external environmental conditions for the non-metallic parts, materials, and lubricant. 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. The ITAAC verifies that: (1) an equipment qualification data report or ASME QME-1 report exists for the non-metallic parts, materials, and lubricants used in mechanical equipment designated for a harsh environment, and (2) the report concludes that the equipment can perform its intended function(s) up to the end of its qualified life under the design basis environmental conditions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q04	**Equipment Qualification** Safety-Related [Digital or Analogue] Equipment Mild Environment Qualification/Installation	The [XXX system] Class 1E equipment located in a mild environment will withstand design basis mild environmental conditions without loss of safety□related function(s).	i. A type test or a combination of type test and analysis will be performed to qualify the [XXX system] Class 1E equipment for the design basis mild environmental conditions ii. An inspection will be performed of the [XXX system] as-built Class 1E equipment located in a mild environment.	i. An [equipment qualification data report(s)] exists and concludes that the [XXX system] Class 1E equipment designated for mild environments in [Table x.x.x-x] will withstand design basis mild environmental conditions without loss of safety-related function(s). ii. The [XXX system] Class 1E equipment designated for mild environments in [Table x.x.x-x] is installed in its design location and is bounded by the [equipment qualification data report].
	Tier 2 Section 14.3 Discussion For Class 1E [digital or analogue] equipment qualified for mild environments, Section 3.11 presents information to demonstrate that the equipment is qualified using a type test, or a combination of type test and analysis to perform its safety-related function(s) in the design basis 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. The ITAAC verifies that: (1) an equipment qualification data report(s) exists for the Class 1E [digital or analogue] equipment, and (2) the equipment qualification data report(s) concludes that the equipment can perform its safety-related function(s) under the design basis mild environmental conditions specified in [Section xxx] and the equipment qualification data report(s). After installation in the plant, an inspection is performed to verify that the Class 1E [digital or analogue] equipment designated for mild environments is installed in its design location and is bounded by the equipment qualification data report.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q05	**<u>Equipment Qualification</u>** Instrumentation & Control Class 1E Digital Equipment EMI, RFI, ESD and SWC Qualification	[XXX system] Class 1E digital equipment can perform its safety-related function(s) when subjected to the design basis electromagnetic interference, radio frequency interference, electrostatic discharge, and electrical surges that would exist before, during, and following a design-basis accident.	Type tests, analysis, or a combination of type tests and analysis, will be performed to qualify the [XXX system] Class 1E digital equipment.	An [equipment qualification report(s)] exists and concludes that the Class 1E digital equipment listed in [Table x.x.x-x] can withstand, without loss of safety-related function(s), the design basis electromagnetic interference, radio frequency interference, electrostatic discharge, and electrical surges that would exist before, during, and following a design-basis accident.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.11 presents information to demonstrate that the [XXX system] Class 1E digital equipment is qualified using a type test, analysis, or a combination of type test and analysis to perform its safety-related function while subjected to electromagnetic interference, radio frequency interference, electrostatic discharge, and electrical surges that would exist before, during, and following a design basis accident. The qualification method employed for Class 1E equipment is the same as the qualification method described for that type of equipment in Section 3.11.x. The ITAAC verifies that: (1) An [equipment qualification data report(s)] exists for the [XXX system] Class 1E digital equipment, and (2) The [equipment qualification data report(s)] concludes that the Class 1E digital equipment can withstand electromagnetic interference, radio frequency interference, electrostatic discharge, and electrical surges that would exist before, during, and following a design basis accident without loss of safety-related function(s).			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q06	**Equipment Qualification** [Safety-related or RTNSS] Valve Functional Qualification	The [XXX system] [Safety-related or RTNSS] valves are functionally designed and qualified to perform their intended [safety-related or RTNSS] function(s) 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] valves.	A Functional Qualification report exists and concludes that the valves listed in [Table x.x.x-x] are capable of performing their intended [safety-related or RTNSS] function(s) 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.
	Tier 2 Section 14.3 Discussion Section 3.9.x discusses that the functional qualification of [safety-related or RTNSS] valves is performed in accordance with ASME QME-1-2007, as accepted in Regulatory Guide 1.100, Rev. 3, with regulatory positions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q07	**Equipment Qualification** [Safety-Related or RTNSS] Pump Functional Qualification	The [XXX system] [Safety-related or RTNSS] pump(s) are functionally designed and qualified such that each pump is capable of performing its intended [safety-related or RTNSS] function(s) 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] pumps.	A Functional Qualification report exists and concludes that the pumps listed in Table [x.x.x-x] are capable of performing their intended [safety-related or RTNSS] function(s) 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.
	Tier 2 Section 14.3 Discussion Section 3.9.x discusses that the functional qualification of [safety-related or RTNSS] pumps is performed in accordance with ASME QME-1-2007, as accepted in Regulatory Guide 1.100, Rev. 3, with regulatory positions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q08	**Equipment Qualification** ASME BPV Code, Section III, Relief Valve Capacity Qualification	The [XXX system] [safety-related or RTNSS] relief valve(s) provide overpressure protection.	i. Vendor tests per ASME BPV Code, Section III, will be performed for each [XXX system] as-built [safety-related or RTNSS] relief valve. ii. An inspection will be performed of each [XXX system] as-built [safety-related or RTNSS] relief valve.	i. ASME BPV Code, Section III, Data report(s) exists, for each relief valve listed in [Table x.x.x-x], and concludes the as-built relief valves meet the valve's required set pressure, overpressure and capacity requirements identified in the Table. ii. Each relief valve listed in [Table x.x.x-x] is installed in its design location and is provided with an ASME Code Certification Mark that identifies the relief valve's set pressure, capacity, and overpressure.
	Tier 2 Section 14.3 Discussion Section 3.9.x discusses the qualification of relief valves to provide overpressure protection in accordance with the ASME *Boiler and Pressure Vessel Code* (BPV Code), Section III. The ITAAC verifies that: (1) the test for each as-built relief valve meets the set pressure, capacity, and overpressure design requirements; and (2) an inspection is performed to verify that each relief valve is installed in its design location and contains an ASME Code Certification Mark that identifies the valve's set pressure, capacity, and overpressure.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q09	**Equipment Qualification** [Safety-Related or RTNSS] Heat Exchanger Capacity Qualification	The [XXX system] [Safety-Related or RTNSS] heat exchanger(s) have the heat removal capacity to transfer the design heat load.	i. Vendor tests or a combination of vendor tests and analysis will be performed on each as-built [XXX system] [safety-related or RTNSS] heat exchanger.	i. A qualification report exists and concludes that the heat transfer capability, UA, (i.e., the product of the overall heat transfer coefficient and the effective heat transfer area) for the heat exchanger(s) listed in [Table x.x.x-x] is greater than or equal to [### Btu/hr-°F].
			ii. An inspection of the [XXX system] as-built [safety-related or RTNSS] heat exchangers will be performed to verify that each exchanger is bounded by the qualification report.	ii. Each heat exchanger listed in [Table x.x.x-x] is bounded by the qualification report.
	Tier 2 Section 14.3 Discussion [Section x.x] discusses that the [XXX system] heat exchangers provide the [safety-related or RTNSS] function of transferring the design heat load from the [YYY system] during [mode of operation]. After manufacture of the [XXX system] heat exchangers, a test or a combination of test and analysis is performed to validate that the [XXX system] heat exchangers are capable of meeting the specified heat transfer performance requirements. The ITAAC verifies that each as-built heat exchanger has a heat transfer capability, UA, greater than or equal to [### Btu/hr-°F], and the installed heat exchanger is bounded by the qualification tests or tests and analysis as documented in the qualification report.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
Q10	**<u>Equipment Qualification</u>** Seismic Capability of RTNSS Equipment	The [XXX system] RTNSS mechanical and electrical equipment, including its associated supports and anchorages, can withstand the design basis seismic loads without loss of its RTNSS function(s) after being subjected to the [safe-shutdown earthquake] seismic loads.	i. A type test, analysis, or a combination of type test and analysis will be performed of the [XXX system] RTNSS mechanical and electrical equipment, including its associated supports and anchorages. ii. An inspection will be performed of the [XXX system] as-built RTNSS mechanical and electrical equipment, including its associated supports and anchorages.	i. A seismic capability report(s) exists and concludes that the [XXX system] RTNSS equipment identified in [Table x.x.x-x], including its associated supports and anchorages, can withstand the design basis seismic loads without loss of its RTNSS function(s) after being subjected to the design basis [safe-shutdown earthquake] seismic loads. ii. The [XXX system] RTNSS equipment listed in [Table x.x.x-x], including its associated supports and anchorages is bounded by the tested and/or analyzed conditions specified in the seismic capability report(s).
	<u>Tier 2 Section 14.3 Discussion</u> This ITAAC will verify that the RTNSS equipment remains capable of performing its RTNSS function(s) following the occurrence of an [SSE] seismic event.			

Sxx –Standard Structural ITAACs and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S01	**<u>As-Built Inspection and Reconciliation Analysis</u>** Seismic Category I Structures	The [YYY structure or containment internal structures] is Seismic Category I and will maintain its structural integrity under the design basis loads.	i. An inspection and reconciliation analysis will be performed of the as-built [YYY structure or containment internal structures]. ii. An inspection will be performed to verify the dimensions of the critical sections of the as-built [YYY structure or containment internal structures].	i. The deviations between the drawings used for construction and the as-built [YYY structure or containment internal structures] have been reconciled, and a design report exists and concludes that the [YYY structure or containment internal structures] will maintain its structural integrity under the design basis loads. ii. The dimensions of the [YYY structure or containment internal structures] critical sections conform to the dimensions provided in [Figure(s) x.x.x-x or Table(s) x.x.x-x].
	<u>Tier 2 Section 14.3 Discussion</u> i. The [YYY structure or containment internal structures] and its design basis loads are discussed in Section 3.8.x. Guidance for the content and structure of the design report is provided in Standard Review Plan (SRP) Section 3.8.4, Appendix C. An ITAAC inspection and reconciliation analysis is performed 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] can maintain its structural integrity under the design basis loads. The design report provides criteria for the reconciliation between design and as-built conditions. --- ii. 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. An ITAAC inspection is performed of the as-built [YYY structure or containment internal structures] to verify the dimensions of the critical sections.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S02	**<u>As-Built Inspection and Analysis</u>** Structures, Systems, and Components (SSCs) - Seismic Interaction	Non-Seismic Category I SSCs located within an impact zone of Seismic Category I SSCs will not impair the ability of Seismic Category I SSCs to perform their safety-related functions during or following a safe-shutdown earthquake (SSE).	An inspection and analysis will be performed to verify that the as-built non-Seismic Category I SSCs located within an impact zone of Seismic Category I SSCs will not impair the ability of Seismic Category I SSCs to perform their safety-related functions.	Non-Seismic Category I SSCs located within an impact zone of Seismic Category I SSCs will not impair the ability of Seismic Category I SSCs to perform their safety-related functions during or following an SSE as demonstrated by one or more of the following criteria: 1. Seismic Category I SSCs are isolated from non-Seismic Category I SSCs so that interaction does not occur. 2. Seismic Category I SSCs are analyzed to confirm that the ability to perform their safety-related functions is not impaired as a result of impact from non-Seismic Category I SSCs. 3. A non-Seismic Category I restraint system designed to Seismic Category I requirements is used to assure that no interaction occurs between Seismic Category I SSCs and non-Seismic Category I SSCs.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.7.x discusses that per Regulatory Guide 1.29, some SSCs that perform no safety-related functions could, if they failed under seismic loading, prevent or reduce the functioning of Seismic Category I SSCs. An ITAAC inspection and analysis is performed to verify that the as-built non-Seismic Category I SSCs located within an impact zone of Seismic Category I SSCs will not impair the ability of Seismic Category I SSCs to perform their safety-related functions as demonstrated by one or more of the following criteria: 1. Seismic Category I SSCs are isolated from non-Seismic Category I SSCs so that interaction does not occur. 2. Seismic Category I SSCs are analyzed to confirm that the ability to perform their safety-related functions is not impaired as a result of impact from non-Seismic Category I SSCs. 3. A non-Seismic Category I restraint system designed to Seismic Category I requirements is used to assure that no interaction occurs between Seismic Category I SSCs and non-Seismic Category I SSCs.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S03	**<u>As-Built Inspection and Reconciliation Analysis</u>** ASME Code Section III, Division 1, Class MC Primary Reactor Containment - Design Report	The ASME Code Class MC [primary reactor containment], including the penetration assemblies, is Seismic Category I and is constructed in accordance with ASME Code Section III, Division 1.	An inspection and reconciliation analysis will be performed of the as-built ASME Code Class MC [primary reactor containment], including the penetration assemblies.	The deviations between the drawings used for construction and the as-built ASME Code Class MC [primary reactor containment], including the penetration assemblies, have been reconciled, and a Design Report that complies with ASME Code Section III, NCA-3550, exists and concludes that the requirements of ASME Code Section III, Division 1 are met.
	<u>Tier 2 Section 14.3 Discussion</u> As required by ASME Code Section III NCA-1210, the ASME Code Class MC [primary reactor containment] requires a Design Report in accordance with NCA-3550. NCA-3551.1 requires that the drawings used for construction shall be in agreement with the Design Report before it is certified and shall be identified and described in the Design Report. It is the responsibility of the N Certificate Holder to furnish a Design Report for each component and support, except as provided in NCA-3551.2 and NCA-3551.3. NCA-3551.1 also requires that a Registered Professional Engineer certify the Design Report when it is for Class MC vessels and supports. NCA-3554 requires that any modification of any document used for construction, from the corresponding document used for design analysis, shall be reconciled with the Design Report. An inspection and reconciliation analysis is performed of the as-built ASME Code Class MC [primary reactor containment], including the penetration assemblies, to verify the requirements of ASME Code Section III, Division 1 are met.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S04	**As-Built Inspection** ASME Code Section III, Division 1, Class MC Components - Data Reports	The ASME Code Class MC components conform to the rules of construction of ASME Code Section III, Division 1.	An inspection will be performed of the documentation required by ASME Code Section III, Division 1 for the as-built ASME Code Class MC components.	The 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, Division 1 are met.
	Tier 2 Section 14.3 Discussion The ASME Code Section III requires documentary evidence be available at the construction or installation site before use or installation to ensure that ASME Code Class MC components conform to the requirements of the Code. As defined in NCA-9000, a component can be a vessel, pump, pressure relief valve, line valve, storage tank, piping system, or core support structure that is designed, constructed, and stamped in accordance with the rules of Section III. The ASME Code Class MC components require a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified by NCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is specified in the Table NCA-8100-1. An ITAAC inspection is performed of the documentation required by ASME Code Section III, Division 1 for the as-built ASME Code Class MC components to (1) ensure that the appropriate Data Reports have been provided as specified in Table NCA-8100-1, (2) ensure that the Certificate Holder or Owner and the Authorized Nuclear Inspector have signed the Data Reports and (3) to verify the requirements of ASME Code Section III, Division 1 are met.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S05	**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 design pressure.	An ASME Code Section III pressure test will be performed of the ASME Code Class MC [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.
	Tier 2 Section 14.3 Discussion Following fabrication of the ASME Code Class MC [primary reactor containment], fabricated to ASME Code Section III, Division 1, a proof test of the ASME Code Class MC [primary reactor containment] is performed to demonstrate the quality of fabrication and to verify the acceptable performance of new design features. In accordance with Section 14.2.x, a preoperational pressure test demonstrates that the structural integrity of the ASME Code Class MC [primary reactor containment] meets the requirements of ASME Code Section III, Division 1 NE-6000.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S06	**<u>As-Built Inspection and Reconciliation Analysis</u>** ASME Code Section III, Division 2, Class CC Concrete Primary Reactor Containment -Construction Report	The ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, is Seismic Category I and is constructed in accordance with ASME Code Section III, Division 2; and the ASME Code Class MC mechanical and electrical penetration assemblies, equipment hatches, and personnel air locks are constructed in accordance with ASME Code Section III, Division 1.	i. An inspection and reconciliation analysis will be performed of the as-built ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners. ii. An inspection and reconciliation analysis will be performed of the as-built ASME Code Class MC mechanical and electrical penetration assemblies, equipment hatches, and personnel air locks.	i. The deviations between the drawings used for construction and the as-built ASME Code Class CC concrete [primary reactor containment] including the liner plate and penetration liners have been reconciled, and a Construction Report that complies with ASME Code Section III, NCA-3380, exists and concludes that the requirements of ASME Code, Section III, Division 2 are met. ii. The deviations between the drawings used for construction and the as-built ASME Code Class MC mechanical and electrical penetration assemblies, equipment hatches, and personnel air locks have been reconciled, and a Design Report that complies with ASME Code Section III, NCA-3550, exists and concludes that the requirements of ASME Code Section III, Division 1 are met..

S06	**<u>Tier 2 Section 14.3 Discussion</u>** As required by ASME Code Section III, NCA-3454, the ASME Code Class CC [primary reactor containment] requires a Construction Report. NCA-3380 requires that the Designer, who shall certify that the Construction Report conforms to the requirements of Division 2 and the Design Specification, shall evaluate the Construction Report. Prior to certification, the Designer shall review the file of as-built, design, shop, and field drawings to establish that the list provided by the Constructor in the Construction Report corresponds to the as-built, design, shop, and field drawings that will be maintained as a file by the Owner. An ITAAC inspection and reconciliation analysis is performed of the as-built ASME Code Class CC [primary reactor containment], including the liner plate and penetration liners, to verify the requirements of ASME Section III, Division 2 are met. As required by ASME Code Section III, NCA-1210, the ASME Code Class MC Components require a Design Report in accordance with NCA-3550. NCA-3551.1 requires that the drawings used for construction shall be in agreement with the Design Report before it is certified and shall be identified and described in the Design Report. It is the responsibility of the N Certificate Holder to furnish a Design Report for each component and support, except as provided in NCA-3551.2 and NCA-3551.3. NCA-3551.1 also requires that a Registered Professional Engineer certify the Design Report when it is for Class MC components. NCA-3554 requires that any modification of any document used for construction, from the corresponding document used for design analysis, be reconciled with the Design Report. An ITAAC inspection and reconciliation analysis is performed of the as-built ASME Code Class MC mechanical and electrical penetration assemblies, equipment hatches, and personnel air locks to verify the requirements of ASME Code Section III, Division 1 are met.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S07	**As-Built Inspection** ASME Code Section III, Division 1 Class CC Concrete Primary Reactor Containment -Data Report	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, Division 2.	An inspection will be performed of the documentation required by ASME Code Section III, Division 2 for the as-built ASME Code Class CC concrete [primary reactor containment]; including the liner plate and penetration liners.	The 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, Division 2 are met.
	Tier 2 Section 14.3 Discussion The ASME Code Section III requires documentation be available to certify that the ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, are constructed in accordance with the requirements of the Code. The ASME Code Class CC concrete [primary reactor containment] requires a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified by NCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is specified in the Table NCA-8100-1. An ITAAC inspection is performed of the documentation required by ASME Code Section III, Division 2 for the as-built ASME Code Class CC concrete [primary reactor containment] including the liner plate and penetration liners to (1) ensure that the appropriate Data Reports have been provided as specified in Table NCA-8100-1, (2) ensure that the Certificate Holder or Owner and the Authorized Nuclear Inspector have signed the Data Report, and (3) verify the requirements of ASME Code Section III, Division 2 are met.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S08	**<u>Preoperational Test</u>** ASME Section III, Division 2, Concrete Containment - Structural Integrity Test	The ASME Code Class CC concrete [primary reactor containment] pressure boundary retains its structural integrity when subjected to design pressure.	An ASME Code Section III Structural Integrity Test will be performed of the ASME Code Class CC concrete [primary reactor containment].	The Structural Integrity Test results for the ASME Code Class CC concrete [primary reactor containment] meet the requirements of ASME Code Section III, Division 2 CC-6000.
	<u>Tier 2 Section 14.3 Discussion</u> Following construction of the ASME Code Class CC concrete [primary reactor containment], constructed to ASME Code, Section III, Division 2, a proof test of the concrete [primary reactor containment] is performed to demonstrate the quality of construction and to verify the acceptable performance of new design features. For pressure suppression type containments, the test shall include a differential pressure test of the boundary between the drywell and wetwell compartments if the boundary loading induces stresses in the containment structure. In accordance with Section 14.2.x, a preoperational test demonstrates that the structural integrity test of the ASME Code Class CC concrete [primary reactor containment], including the liner plate and penetration liners, meets the requirements of ASME Code Section III, Division 2 CC-6000.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
S09	**<u>As-Built Inspection and Reconciliation Analysis</u>** Radwaste Category [RW-XX] Structural Integrity	The [YYY structure] is a non-Seismic Category I [RW-XX] structure, constructed in accordance with the general design criteria of RG 1.143.	An inspection and reconciliation analysis will be performed of the as-built [RW-XX] [YYY structure].	The deviations between the drawings used for construction and the as-built [RW-XX] [YYY structure] have been reconciled, and the general design criteria of RG 1.143 are met.
	<u>Tier 2 Section 14.3 Discussion</u> The [RW-XX] [YYY structure] general design criteria are described in RG 1.143. 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 general design criteria of RG 1.143 are met.			

Exx – Electrical ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E01	**<u>Preoperational Testing</u>** Class 1E Electrical Divisional Power Verification	The [XXX system] Class 1E equipment is powered from the appropriate Class 1E division.	A test will be performed of the [XXX system] as-built 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].
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses the [XXX system] electrical distribution system. Each division of the [XXX system] electrical distribution equipment provides power to Class 1E equipment from the appropriate Class 1E division. In accordance with Section 14.2.x, a preoperational test demonstrates that [XXX system] Class 1E equipment is powered from the respective Class 1E division.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E02	**As-built Inspection** Physical Separation of Class 1E Power Circuits	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 as-built [XXX system] Class 1E 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 minimum 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 minimum separation distance and barriers.
	Tier 2 Section 14.3 Discussion Section 8.x discusses the independence of [XXX system] Class 1E power circuits per the guidance of Regulatory Guide 1.75, which endorses IEEE Std. 384-1992. Minimum separation distance (as defined in IEEE Std. 384-1992), or barriers or any combination thereof may achieve physical separation as specified in IEEE Std. 384-1992. Electrical isolation may be achieved by the use of minimum separation distance, isolation devices, shielding and wiring techniques, or combinations thereof. Per IEEE Std. 384-2008, there is no minimum separation distance criterion between Class 1E circuits (target) and fiber-optic circuits (source). Physical separation and electrical isolation is provided to maintain the independence of Class 1E power circuits so that the safety functions required during and following any design basis event can be accomplished. Separate ITAAC inspections are performed to verify the independence provided by physical separation and the independence provided by electrical isolation. This ITAAC verifies the independence of Class 1E power circuits by physical separation. An ITAAC inspection is performed of physical separation of the as-built [XXX system] Class 1E power circuits. The physical separation ITAAC inspection results verify the following physical separation criteria are met. • 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 minimum separation distance and barriers. • 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 minimum separation distance and barriers.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E03	**As-built Inspection** Electrical Isolation of Class 1E Power Circuits	Electrical isolation exists between [XXX system] Class 1E power circuits and non-Class 1E power circuits.	i. Type test, analysis, or combination of type test and analysis will be performed of the Class 1E isolation devices. ii. An inspection will be performed of the as-built [XXX system] Class 1E 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 isolation devices are installed between [XXX system] Class 1E power circuits and non-Class 1E power circuits.
	Tier 2 Section 14.3 Discussion Section 8.x discusses the independence of [XXX system] Class 1E power circuits per the criteria of Regulatory Guide 1.75, which endorses IEEE Std. 384-1992. Electrical isolation is provided between Class 1E power circuits and non-Class 1E power circuits so a failure in a non-Class 1E power circuit does not prevent safety-related function completion in the Class 1E power circuit. An ITAAC inspection is performed to verify that qualified Class 1E isolation devices are installed between [XXX system] Class 1E power circuits and non-Class 1E power circuits, which satisfy the guidance of Regulatory Guide 1.75.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E04	**Design Analysis** Class 1E AC and DC Circuit Interrupting Devices Coordination Analysis	The [XXX system] Class 1E circuit interrupting devices provide electrical fault protection coordination to limit the loss of equipment due to postulated fault conditions.	A coordination analysis will be performed of the as-built [XXX system] Class 1E circuit interrupting devices.	The Class 1E circuit-interrupting device closest to a fault opens before other Class 1E circuit interrupting devices.
	Tier 2 Section 14.3 Discussion Section 8.x discusses that coordination studies are conducted in accordance with IEEE Std. 242-2001 to verify the protection feature coordination capability to limit the loss of equipment due to postulated fault conditions. The ITAAC analysis verifies that a Coordination Study for the as-built [XXX system] Class 1E circuit interrupting devices is performed to confirm that the circuit-interrupting device closest to the fault opens before other circuit interrupting devices.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E05	**<u>Design Analysis and As-Built Inspection</u>** Class 1E AC Electrical Equipment Capacity	The [XXX system] Class 1E AC [switchgear, load centers, motor control centers (MCCs), transformers, feeder breakers, load breakers, cables, and containment electrical penetration assemblies] are sized to power their design loads.	i. An analysis will be performed to determine the required design electrical rating of the [XXX system] Class 1E AC [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, cables, and containment electrical penetration assemblies]. ii. An inspection will be performed of each as-built [XXX system] Class 1E AC [switchgear, load center, MCC, transformer, feeder breaker, load breaker, cable, and containment electrical penetration assembly].	i. The required design electrical rating to power the design loads of each [XXX system] Class 1E AC [switchgear, load center, MCC, transformer, feeder breaker, load breaker, and containment electrical penetration assembly] listed in [Table x.x.x-x] and the associated cables, is determined. ii. The electrical rating of each [XXX system] Class 1E AC [switchgear, load center, MCC, transformer, feeder breaker, load breaker, and containment electrical penetration assembly] listed in [Table x.x.x-x] and the associated cables is greater than or equal to the required design electrical rating.
	<u>Tier 2 Section 14.3 Discussion</u> i. Section 8.x discusses that the [XXX system] Class 1E AC [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, cables and containment electrical penetration assemblies] are sized to power their design loads. The ITAAC verifies that a Capacity Analysis is performed to determine the required design electrical rating needed to power the design loads of each [XXX system] Class 1E AC [switchgear, load center, MCC, transformer, feeder breaker, load breaker, cable, and containment electrical penetration assembly]. ii. Section 8.x discusses that the [XXX system] Class 1E AC [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, and containment electrical penetration assemblies] are sized to power their design loads. An ITAAC inspection is performed to verify that the electrical rating of each [XXX system] Class 1E AC [switchgear, load center, MCC, transformer, feeder breaker, load breaker, cable, and containment electrical penetration assemblies] is greater than or equal to the required design electrical rating. This ITAAC inspection may be performed any time after manufacture of the Class 1E AC [switchgear, load centers, MCCs, transformers, feeder breakers, load breakers, cables, and containment electrical penetration assemblies].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E06	**Preoperational Testing** 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 design loads.
	Section 14.3 Discussion Section 8.x discusses that the [XXX system] Class 1E AC inverters are sized to power their design loads. In accordance with Section 14.2.x, a preoperational test demonstrates that each [XXX system] Class 1E inverter maintains rated voltage and rated frequency while the inverter supplies design loads. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E07	**Preoperational Testing** 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 design loads.
	Section 14.3 Discussion Section 8.x discusses that the [XXX system] Class 1E battery chargers are sized to power their design loads. In accordance with Section 14.2.x, a preoperational test demonstrates that each [XXX system] Class 1E battery charger maintains rated voltage acceptable for its AC loads while the battery charger supplies design loads. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E08	**<u>Preoperational Testing</u>** 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 rated voltage while the battery supplies design loads.
	<u>Section 14.3 Discussion</u> Section 8.x discusses that the [XXX system] Class 1E batteries are sized to power their design loads. In accordance with Section 14.2.x, a preoperational test demonstrates that the terminal voltage for each [XXX system] Class 1E battery is greater than the rated voltage [#### volts] for a specified time [## hours] while not exceeding individual cell limit of [### volts] with a discharge rate that is based on the manufacturer's rating of the battery for the selected test length. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E09	**<u>Preoperational Test</u>** Class 1E Emergency Diesel Generator Load Test	The [XXX system] Class 1E emergency diesel generators are capable of supplying their rated loads.	A rated load 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 rated load.
	<u>Section 14.3 Discussion</u> Section 8.x discusses that the [XXX system] Class 1E emergency diesel generators are capable of supplying their rated loads. Section 8.x provides the acceptable ranges of generator terminal voltage and frequency for the emergency diesel generator while operating with load. In accordance with Section 14.2.x, a preoperational test demonstrates that each [XXX system] Class 1E emergency diesel generator listed in [Table x.x.x-x] maintains a generator terminal voltage between [### volts AC] and [### volts AC], and a frequency between [### Hz] and [### Hz] while operating at the following test conditions: The emergency diesel generator is operated at a load equivalent to the short-time rating of the diesel generator for an interval of [2 hours] or greater. The emergency diesel generator is operated at a load equivalent of [90-100%] continuous rating of the diesel generator for an interval of [22 hours] or greater. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">E10</td><td><u>Preoperational Test</u>
Class 1E Emergency Diesel Generator Load Shed and Sequencer Test</td><td>Upon loss of off-site power, the [XXX system] Class 1E emergency diesel generators automatically start and attain 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.</td><td>A test will be performed of the [XXX system] Class 1E emergency diesel generators and associated Class 1E buses.</td><td>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]:

1. The Class 1E emergency diesel generator starts on the auto-start signal from its standby conditions, and attains design voltage and frequency within the required time.

2. Loads are shed from the associated Class 1E buses.

3. Shutdown loads are automatically sequenced onto their associated Class 1E bus.</td></tr>
<tr><td colspan="4"><u>Section 14.3 Discussion</u>
Section 8.x discusses that upon loss of off-site power, the [XXX system] Class 1E emergency diesel generators automatically start and attain design voltage and frequency within the required time; the loads are shed from the associated [XXX system] Class 1E bus; and shut-down loads are automatically sequenced onto the Class 1E bus. Table 8.x-x contains a list of loads to be sequenced onto the bus after a loss of loss-site power.
In accordance with Section 14.2.x, a preoperational test demonstrates that upon a simulated loss of off-site power, the following responses are obtained for each [XXX system] Class 1E emergency diesel generator:
1. The Class 1E emergency diesel generator starts on the auto-start signal from its standby conditions, and attains design voltage and frequency with [Table 8.x-x or Section 8.x].
2. Loads are shed from the associated Class 1E buses.
3. Shutdown loads listed in [Table 8.x-x or Section 8.x] are automatically sequenced onto their associated Class 1E bus.
The loads are operated for a minimum of [five minutes]. Sequenced loads are operated at design conditions to the extent practical, consistent with preoperational test limitations. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.</td></tr>
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No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E11	**<u>Preoperational Test</u>** Class 1E Emergency Diesel Generator Automatic Start Test	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.
	<u>Section 14.3 Discussion</u> Section 8.x discusses that 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. Section 8.x provides the time required to obtain rated voltage and frequency. In accordance with Section 14.2.x, a preoperational test demonstrates that upon a simulated safety injection signal, each [XXX system] Class 1E emergency diesel generator starts on the auto-start signal from its standby conditions, and attains design voltage and frequency within [xx] seconds. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E12	**<u>As-built Inspection</u>** 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 its required design time period.	An inspection will be performed of the as-built [XXX system] Class 1E 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].
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses that 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 following any design basis event for [7 days]. Section 8.x provides the required usable fuel oil storage tank volume. An ITAAC inspection is performed to verify that each [XXX system] emergency diesel generator fuel oil storage tank 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]. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E13	**Preoperational Test** Class 1E Emergency Diesel Generator Fuel Oil Makeup Flow Rate Test	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.
	Section 14.3 Discussion Section 8.x discusses that the [XXX system] Class 1E emergency diesel generator has a sufficient fuel makeup flow rate to allow continuous operation of the emergency diesel generator while the diesel generator is operating at its 100% continuous rated load. Section 8.x provides the diesel generator fuel oil consumption rate while operating at its 100% continuous rating. In accordance with Section 14.2.x, a preoperational test demonstrates that each [XXX system] Class 1E emergency diesel generator fuel oil transfer pump 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. This test is performed using installed loads, simulated loads, or a combination of installed and simulated loads.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E14	**As-built Inspection** *{Use the following ITAAC if a Station Blackout Diesel Generator exists}* The Station Blackout Diesel Generator is Diverse from the Class 1E Emergency Diesel Generators	The electrical and mechanical portions of the station blackout diesel generator have manufacturer or model diversity from the electrical and mechanical portions of the Class 1E emergency diesel generators to prevent a common mode failure.	An inspection will be performed of the as-built electrical and mechanical portions of the station blackout diesel generator and the Class 1E emergency diesel generators.	The electrical and mechanical portions of the station blackout diesel generator have manufacturer or model diversity from the electrical and mechanical portions of the Class 1E emergency diesel generators.
	Tier 2 Section 14.3 Discussion Section 8.x discusses that the electrical and mechanical portions of the station blackout diesel generator are diverse from the Class 1E emergency diesel generators to prevent a common mode failure. An ITAAC inspection is performed to verify that the electrical and mechanical portions of the station blackout diesel generator are diverse from the electrical and mechanical portions of the Class 1E emergency diesel generators either by manufacturer or they are different models from the same manufacturer.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E15	**<u>Preoperational Test</u>** Main Control Room and Remote Shutdown Station Normal Illumination Test	The [XXX system] provides normal illumination of the operator workstations and safety-related panels in the main control room and [remote shutdown station].	i. A test will be performed of the main control room operator workstations and safety-related panel illumination. ii. A test will be performed of the [remote shutdown station] operator workstations and safety-related panel illumination.	i. The [XXX system] provides at least [100] foot-candles illumination at the main control room operator workstations and at least [50] foot-candles at the safety-related panels. ii. The [XXX system] provides at least [100] foot-candles illumination at the [remote shutdown station] operator workstations and at least [50] foot-candles at the safety-related panels.
	<u>Tier 2 Section 14.3 Discussion</u> Section 9.5.x discusses the [XXX system] which provides normal illumination of the operator workstations and safety-related panels in the main control room and [remote shutdown station]. In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] provides at least [100] foot-candles illumination at the main control room operator workstations and at least [50] foot-candles at the safety-related panels. In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] provides at least [100] foot-candles illumination at the [remote shutdown station] operator workstations and at least [50] foot-candles at the safety-related panels.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E16	**Preoperational Test** Main Control Room and Remote Shutdown Station Emergency Illumination Test	The [XXX system] provides emergency illumination of the operator workstations and safety-related panels in the main control room and [remote shutdown station].	i. A test will be performed of the main control room operator workstations and safety-related panel illumination. ii. A test will be performed of the [remote shutdown station] operator workstations and safety-related panel illumination.	i. The [XXX system] provides at least [10] foot-candles of illumination at the main control room operator workstations and safety-related panels when it is the only main control room lighting system in operation. ii. The [XXX system] provides at least [10] foot-candles at the [remote shutdown station] operator workstations and safety-related panels when it is the only [remote shutdown station] lighting system in operation.
	Tier 2 Section 14.3 Discussion Section 9.5.x discusses the [XXX system] which provides normal illumination of the operator workstations and safety-related panels in the main control room and [remote shutdown station]. In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] provides at least [10] foot-candles of illumination at the main control room operator workstations and safety-related panels when it is the only main control room lighting system in operation. In accordance with Section 14.2.x, a preoperational test demonstrates that the [XXX system] provides at least [10] foot-candles at the [remote shutdown station] operator workstations and safety-related panels when it is the only [remote shutdown station] lighting system in operation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E17	**As-Built Inspection** Division Separation and Functional Arrangement	Each [XXX system] electrical division is physically separated, and its location and functional arrangement is as described in the [Section x.x.x] Design Description and [Table x.x.x-x], and is as shown on [Figure x.x.x-x].	An inspection will be performed of the [XXX system] as-built electrical equipment location, functional arrangement, and physical separation.	The [XXX system] as-built electrical equipment location, functional arrangement, and physical separation is as described in the [Section x.x.x] Design Description and [Table x.x.x-x], and is as shown on [Figure x.x.x-x].
	Tier 2 Section 14.3 Discussion Section 8.x discusses the [XXX system] and provides details on the separation of divisions, and the functional arrangement of the [XXX system]. Regulatory Guide (RG) 1.75, which endorses IEEE Std. 384-1992 discusses "Criteria for Independence of Electrical Safety Systems," and provides guidance on the separations of electrical divisions. Other guidance on divisional separation and functional arrangement can be found in RG 1.32 "Criteria for Power Systems for Nuclear Power Plants." General Design Criteria (GDC) 5 discusses the sharing of structures systems, and components. This ITAAC inspection verifies the divisional separation and functional arrangement of the [XXX system]. The overall design objective is to locate the divisional equipment and associated control, instrumentation, electrical supporting systems, and interconnecting cabling such that separation is maintained between all divisions. Redundant divisions of electric equipment and cabling should be located in separate rooms or fire areas wherever possible. Electrical equipment and wiring for safety-related systems which are segregated into separate divisions should be separated so that no design basis event is capable of disabling more than one division of any engineered safety feature (ESF). Safety-related electrical equipment (batteries, distribution panels, etc.) should be located in separate seismic Category I rooms in the reactor building to ensure electrical and physical separation among divisions. Separation of safety-related equipment may be achieved by separate safety-related structures, barriers, or a combination thereof. Exceptions to the separation requirements are identified in section 9.X.X.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E18	**Preoperational Testing** Class 1E Control Power Verification	Control power for the [XXX system] Class 1E switchgear and load centers is provided from the respective division's Class 1E [XXX].	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 the respective division's Class 1E [XXX].
	Tier 2 Section 14.3 Discussion Section 8.x discusses the [XXX system] control power for the Class 1E electrical distribution system. IEEE 603-1991, and IEEE 308-1980 provide requirements for the control power of class 1E equipment including switchgear and load centers. Test signals should be used to determine that the equipment being tested is in fact being powered by the respective division's specified Class 1E power source. In accordance with Section 14.2.x, a preoperational test demonstrates that [XXX system] Class 1E control power for the Class 1E electrical distribution system equipment is provided from the respective division's Class 1E [XXX].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E19	**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] as-built 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.
	Tier 2 Section 14.3 Discussion Section 8.x discusses instantaneous and thermal overload fault protection and coordination to limit the loss of equipment due to postulated fault conditions. This ITAAC (1) verifies that the Class 1E circuit interrupting devices trip points are properly set and will trip open on an instantaneous or thermal overload condition within their design requirements and (2) confirms that the circuit-interrupting device closest to a fault opens before other circuit interrupting devices in accordance with the requirements of the coordination analysis.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E20	**<u>Design Analysis</u>** Class 1E Electrical Equipment Fault Capacity Analysis	The [XXX system] Class 1E [switchgear, load centers, MCCs, transformers, cables, and containment electrical penetration assemblies] are rated to withstand fault currents for the time required to clear the fault from its power source.	A short-circuit analysis will be performed of the [XXX system] Class 1E [switchgear, load centers, MCCs, transformers, cables, and containment electrical penetration assemblies].	The current carrying capability for the [XXX system] Class 1E [switchgear, load centers, MCCs, transformers and containment electrical penetration assemblies] listed in [Table x.x.x-x], and the associated cables, is greater than the analyzed fault currents for the time required to clear the fault from its power source as determined by circuit interrupting device coordination analysis.
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses instantaneous and thermal overload fault protection to limit the loss of equipment due to postulated fault conditions. The ITAAC verifies that the Class 1E switchgear, load centers, MCCs, transformers, and containment electrical penetration assemblies can withstand fault currents for the time required to clear the fault from its power source.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E21	**<u>Design Analysis</u>** 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.
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses harmonic distortion waveforms, and the methods by which the class 1E equipment is not prevented from performing its safety-related functions due to the harmonic distortion waveform. Variations in voltage, frequency, and waveform (harmonic distortion) in the onsite power system and its components during any mode of plant operation must not degrade the performance of any safety system load below an acceptable level. IEEE Standards 308, and 741 provide guidance on system power quality limits and the effects of degraded voltage. The ITAAC analysis verifies that any harmonic distortion waveforms generated do not exceed the acceptable voltage distortion limit as described in Section 8.x.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E22	**Preoperational Tests** 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.	Tests will be performed to verify that the as-built Class 1E [###] voltage buses are automatically transferred to the alternate preferred offsite power supply.	The Class 1E [###] voltage buses are automatically transferred to the alternate preferred offsite power supply on loss of the normal preferred offsite power supply.
	Tier 2 Section 14.3 Discussion Section 8.x discusses the automatic transfer to the [alternate preferred offsite power supply] for the Class 1E voltage buses if the normal preferred offsite power supply is unavailable. The components associated with the alternate preferred power supply are physically separated and designed to exclude, to the extent practical, the potential for simultaneous failure of the normal and alternate preferred power supply systems under operating, and postulated accident conditions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E23	**Preoperational Tests** 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.	Tests will be performed to verify that when DC input power to the as-built Class 1E inverter power supply unit is lost, input power to the as-built Class 1E inverter power supply unit is provided by the regulating transformer without interruption of power to the loads.	When DC input power to the as-built Class 1E inverter power supply unit is lost, input power to the as-built Class 1E inverter power supply unit is provided by the regulating transformer without interruption of power to the loads.
	Tier 2 Section 14.3 Discussion Section 8.x discusses the uninterrupted transfer of the Class 1E inverter power supply from DC input power to the regulating transformer when DC input power is lost. IEEE 603 requires that Class 1E power systems shall perform all safety functions required for a design basis event in the presence of a single failure. IEEE 379 provides additional guidance on the application of the single failure criterion. Section 14.2.x requires preoperational tests to determine that the loss of the preferred power supply can be detected, and that each Class 1E standby power supply can be started and can accept its design load within the time specified in the design basis while maintaining acceptable voltage regulation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E24	**Preoperational Tests** EDG Air Start Capacity	The starting air 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.	Test will be performed of each EDG's air start system.	Each EDG can be started five times without replenishing air to the receiver tanks.
	Tier 2 Section 14.3 Discussion Section 8.x describes the EDG, its associated components and the required combined air capacity for the EDG starting air system. Guidance is provided in Regulatory Guide 1.9, "Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants." Additional guidance is available in IEEE 387, "IEEE Standard Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations." In accordance with Section 14.2.x, a preoperational test demonstrates that the EDG air start system tanks have an overall capacity that is great enough to perform five successful starts of each EDG, without being replenished.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E25	**As-Built Inspection and Analysis**	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.
	Tier 2 Section 14.3 Discussion Section 8.x describes the EDG, and its associated components. An ITAAC inspection and analysis is performed to verify that the location of the EDG fresh air intake is in a position to prevent EDG exhaust from being drawn into the fresh air intake.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E26	**Preoperational Test** Class 1E EDG Protection Systems bypass Test	When the Class 1E EDG is started by an engineered safety feature (ESF) actuation signal, all Class 1E EDG protection systems, except for overspeed and generator differential current, are bypassed.	Tests will be performed of the as-built Class 1E EDG protection systems.	All Class 1E EDG protection systems, except for overspeed and generator differential current, are bypassed when the Class 1E EDG is started by an ESF actuation signal.
	Tier 2 Section 14.3 Discussion Section 8.x describes the EDG and its associated components. Section 7.x describes the protection system, which provides the ESF actuation signal to the EDG. Table 7.x-x lists the ESF actuation signals, and the associated actions that the ESF signal produces, including the ones that start the EDG's. Section 7.x.x describes the protection systems that are bypassed when the EDG receives an ESF actuation signal. This test may be performed using real or simulated signals.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E27	**Design Analysis** Design EDG Capacity Requirements	Each EDG output rating is greater than the analyzed loads assigned in the respective [XXX] divisions.	An analysis will be performed to verify that each as-built EDG output rating is greater than the analyzed loads assigned in the respective as-built [XXX] divisions.	Each EDG output rating is greater than the analyzed loads assigned in the respective as-built [XXX] divisions.
	Tier 2 Section 14.3 Discussion Section 8.x discusses that the [XXX system] EDG output ratings are greater than the analyzed loads assigned to their respective divisions. Section 8.x provides the loads assigned to each respective division, which is powered by that divisions EDG. This analysis will confirm that the as-built division's provide the expected loads, and that the as-built EDG output rating is capable of handling the respective load.			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">E28</td><td><u>Preoperational Test</u>
Eight-hour battery pack emergency lighting fixtures</td><td>Eight-hour battery pack emergency lighting fixtures provide illumination for post-fire safe-shutdown activities performed by operators outside the MCR and [RSS] where post-fire safe-shutdown activities are performed.</td><td>A test will be performed to verify that eight-hour battery pack emergency lighting fixtures provide illumination for post-fire safe-shutdown activities performed by operators outside the MCR or [RSS].</td><td>Eight-hour battery pack emergency lighting fixtures provide at least 1 foot-candle illumination in the areas outside the MCR or [RSS] where post-fire safe-shutdown activities are performed.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
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:
• 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 fire fighting and the remote shutdown area.
This test will ensure that these emergency lighting fixtures provide illumination for post-fire safe-shutdown activities of at least 1 foot-candle for eight hours.</td></tr>
</table>

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E29	**<u>As-Built Inspection and Analysis</u>** 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 in Seismic Category I raceways in Seismic Category I structures and within their respective raceway divisions.
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses the Class 1E power distribution cables and the respective Class 1E raceways. Raceways should not be shared between Class 1E and non-Class 1E cables. Raceways should also not be shared between Class 1E cables of multiple trains or divisions. Standards for Class 1E raceways are provided in IEEE Std 603 "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," and IEEE Std 628 "IEEE Standard Criteria for the Design, Installation and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Generating Stations. Standards for Class 1E Cables are provided in IEEE Std 323 "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," and IEEE Std 383 "IEEE Standard for Qualifying Class 1E Electric Cables and Field Splices for Nuclear Power Generating Stations." IEEE Std 384 "IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits," provides guidance on the independence requirements for Class 1E cables and raceways.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
E30	**<u>Preoperational Test and Analysis</u>** *{Use the following ITAAC if a Station Blackout Diesel Generator exists}* Station Blackout Diesel Generator	The station blackout diesel generator 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 a test and analysis will be performed of the station blackout diesel generator.	The station blackout diesel generator can be aligned to one train of safe-shutdown equipment within [10 minutes or within 60 minutes if a Coping analysis exists and supports the increased time interval].
	<u>Tier 2 Section 14.3 Discussion</u> Section 8.x discusses that the station blackout diesel generator can be aligned to power one train of safe-shutdown equipment within [10 minutes of a LOOP or within 60 minutes if a Coping analysis has been performed and supports the longer time interval]. An ITAAC test is performed to verify that the station blackout diesel generator can power at least one train of safe-shutdown equipment within the require time period.			

Ixx - I&C ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I01	**Design Analysis** Software Lifecycle	The [YYY 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. 1. [Phase Name 1]. 2. [Phase Name 2]. . . N. [Phase Name N].	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].	i. The output documentation of the [YYY System] [Phase Name 1] satisfies the requirements of [Phase Name 1]. ii. The output documentation of the [YYY System] [Phase Name 2] satisfies the requirements of [Phase Name 2]. . . . N. The output documentation of the [YYY System] [Phase Name N] satisfies the requirements of [Phase Name N].
	Tier 2 Section 14.3 Discussion 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.“			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I02	***Design Analysis*** Software Lifecycle Implementation for Protection System	Protection System design and software are implemented using a quality process.	An analysis will be performed on the Protection System implementation of the quality process.	The Protection System design and software were implemented in accordance with the Protection System quality process.
	Tier 2 Section 14.3 Discussion 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, 1.172, and 1.173, 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 commitment. 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 are 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."			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I03	**Preoperational Test** System Software Modification Restrictions	Measures are provided to restrict modifications to the [YYY System] software.	A test will be performed on the [YYY System] software by attempting to modify the software without authorization.	Protective measures restrict modification to the [YYY System] software without proper authorization.
	Tier 2 Section 14.3 Discussion Guidance on this issue is provided in DI&C-ISG-04 Revision 1, "Highly-Integrated Control Rooms – Communications Issues (HICRc)", under interdivisional communications, staff position 10. Protective measures may include requiring a physical cable disconnect, or a keylock, which can physically open the data transmission circuit or interrupt the hardwired logic connection.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I04	**<u>As-Built Inspection</u>** Physical Separation of Class 1E Instrumentation and Control Circuits	Physical separation exists between the redundant divisions of the [YYY system] Class 1E instrumentation and control current-carrying circuits, and between Class 1E instrumentation and control current-carrying circuits and non-Class 1E instrumentation and current-carrying circuits.	An inspection will be performed of the as-built [YYY system] Class 1E instrumentation and control current-carrying circuits.	i. Physical separation between redundant divisions of [YYY system] Class 1E instrumentation and control current-carrying circuits is provided by a minimum separation distance, or by barriers (where the minimum separation distances cannot be maintained), or by a combination of minimum separation distance and barriers. ii. Physical separation between [YYY system] Class 1E instrumentation and control current-carrying circuits and the non-Class 1E instrumentation and 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 minimum separation distance and barriers.

I04	**<u>Tier 2 Section 14.3 Discussion</u>** Section 7.x discusses the independence of [XXX system] Class 1E instrumentation and control circuits per the guidance of Regulatory Guide 1.75, which endorses IEEE Std. 384-1992. Section 7.x discussion includes the separation of fiber-optic cables addressed in IEEE Std. 384-2008. Physical separation is provided to maintain the independence of Class 1E instrumentation and control current-carrying circuits so that the safety functions required during and following any design basis event can be accomplished. Physical separation may be achieved by minimum separation distance, or barriers or any combination thereof. An ITAAC inspection is performed of physical separation of the as-built [XXX system] Class 1E instrumentation and control current-carrying circuits. The physical separation ITAAC inspection results verify that the following physical separation criteria are met. • The minimum separation distance between redundant divisions of [XXX system] Class 1E instrumentation and control current-carrying circuits satisfy the criteria of Regulatory Guide 1.75, or barriers have been installed where the minimum separation distances cannot be maintained, or a combination of minimum separation distances and barriers are used to provide physical separation. The configuration of each as-built barrier agrees with its associated as-built drawing. Per IEEE Std. 384-2008, there is no minimum separation distance criterion for fiber-optic circuit to fiber-optic circuit. • The minimum separation distance between [XXX system] Class 1E instrumentation and control current-carrying circuits and non-Class 1E current-carrying circuits satisfy the criteria of Regulatory Guide 1.75, or barriers have been installed where the minimum separation distances cannot be maintained, or a combination of minimum separation distances and barriers are used to provide physical separation. The configuration of each as-built barrier agrees with its associated as-built drawing.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I05	**<u>As-Built Inspection</u>** Class 1E [XXX system] power sources	The Class 1E [XXX system] equipment is powered from two safety-related power sources.	Inspection of the as-built [XXX system] will be performed.	The Class 1E [XXX system] equipment listed in [Table x.x.x-x] is powered from two safety-related power sources: the first source is its respective Class 1E division and the second source is another division of the [XXX system].
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the power sources used to power the [XXX system] Class 1E instrumentation. Electrical independence and redundancy is required through IEEE Std 603, and guidance is provided in Regulatory Guide 1.75, which endorses IEEE Std. 384-1992. The use of two safety-related power sources ensures that the requirements for single failure criteria will be met. This inspection ensures that the as-built [XXX system] equipment for each division is provided with two separate and redundant safety-related power sources. The first power source should be the normal source for its respective division, and the second power source should be the source for an alternate division. The preferred and alternate power sources for each division are discussed in section 7.x.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I06	Qualification and Inspection of electrical isolation devices	Electrical isolation is provided on connections between the [XXX system] divisions to prevent the propagation of credible electrical faults.	i. Type tests, analyses, or a combination of type tests and analyses of the electrical isolation devices for electrical independence will be performed. ii. An inspection will be performed of the connections between as-built [XXX system] divisions.	i. Class 1E electrical isolation devices prevent propagation of credible electrical faults. ii. Class 1E electrical isolation devices exist on connections between [XXX system] divisions.
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the electrical isolation devices used between divisions of the [XXX system] I&C divisions. This section also provides information on the tests and analyses that will be used to ensure that the electrical isolation devices are capable of preventing the propagation of any credible electrical faults. Branch Technical Position (BTP) 7-11 provides guidance for the application and qualification of electrical isolation devices. The ITAAC type tests and analyses ensure that the Class 1E electrical isolation devices being used are capable of preventing the propagation of any credible electrical faults to the [XXX system], and the ITAAC inspection ensures that the Class 1E electrical isolation devices exist between divisions of the [XXX system].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I07	**<u>As-Built Inspection</u>** Electrical Isolation of Class 1E Instrumentation and Control Circuits	Electrical isolation exists between the redundant divisions of the [YYY system] Class 1E instrumentation and control circuits, and between Class 1E instrumentation and control circuits and non-Class 1E circuits.	An inspection will be performed of the as-built [YYY system] Class 1E instrumentation and control circuits.	i. Class 1E electrical isolation devices are provided between redundant divisions of [YYY system] Class 1E instrumentation and control circuits. ii. Class 1E electrical isolation devices are provided between [YYY system] Class 1E instrumentation and control circuits and non-Class 1E circuits
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the independence of [YYY system] Class 1E instrumentation and control circuits per the criteria of Regulatory Guide 1.75, which endorses IEEE Std. 384-1992. Electrical isolation is provided to maintain the independence of Class 1E instrument and control circuits so that the safety functions required during and following any design basis event can be accomplished. Electrical isolation is provided by isolation device. The electrical isolation ITAAC inspection results verify the following electrical isolation criteria are met. i. Class 1E electrical isolation devices that satisfy the criteria of Regulatory Guide 1.75 are provided between [YYY system] Class 1E instrumentation and control circuits and non-Class 1E circuits. ii. Class 1E electrical isolation devices that satisfy the criteria of Regulatory Guide 1.75 are provided between [YYY system] Class 1E instrumentation and control circuits of redundant divisions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I08	**<u>Preoperational Test and Analysis</u>** Communication Independence Between Redundant Class 1E Digital Communication Divisions Test	Independence exists between redundant divisions of the [YYY system] Class 1E digital communications system.	Tests or a combination of tests and analyses will be performed of the as-built [YYY system] Class 1E digital communications system.	Independence between redundant divisions of the [YYY system] Class 1E digital communications system is provided.
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the communication independence between redundant Class 1E digital communication system divisions. The purpose is to verify proper data isolation between redundant divisions. Requirements for independence are given in IEEE Std 603. Guidance for providing independence between redundant divisions of the Class 1E digital communication system is provided in Digital Instrumentation and Controls Interim Staff Guidance (ISG) 04, and Standard Review Plan (SRP) Section 7.9 (NUREG-0800).			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I09	**<u>Preoperational Test and Analysis</u>** Communication Independence Between Class 1E Digital Communications and non-Class 1E Digital Communications Test	Independence exists between the [YYY system] Class 1E digital communications system and non-Class 1E digital communications systems.	Tests or a combination of tests and analyses will be performed of the as-built [YYY system] Class 1E digital communications system.	Independence between the [YYY system] Class 1E digital communications system and non-Class 1E digital communications systems is provided.
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the communication independence between Class 1E digital communication systems and non-Class 1E digital communication systems. The purpose is to verify that logical or software malfunction of the non-safety system cannot affect the functions of the safety system. Requirements for independence are given in IEEE Std 603. Guidance for providing independence between the Class 1E digital communication system and non-Class 1E digital communication systems is provided in Digital Instrumentation and Controls Interim Staff Guidance (ISG) 04, and Standard Review Plan (SRP) Section 7.9 (NUREG-0800).			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I10	**Preoperational Test** Protection System Automatic Control – Reactor Trip Signal Initiation Test	The [Protection System] automatically initiates a reactor trip signal.	A test will be performed of the as-built [Protection System].	A reactor trip signal is automatically initiated for each function listed in [Table x.x.x-x]
	Tier 2 Section 14.3 Discussion Section 7.x describes automatic and manual reactor trips, variables that are monitored to provide input into automatic reactor trip signals, and the features of the reactor trip system. The reactor trip functions are listed in Table 7.x-x and are discussed in Section 7.x. The reactor trip logic for the monitored variables is provided in Table 7.x-x. The actuation logic for each reactor trip function is discussed in Section 7.x, as well as the input variables for each trip signal. The [Protection System] initiates an automatic reactor trip signal when the associated plant condition(s) exist. In accordance with Section 14.2.x, a preoperational test demonstrates that an automatic reactor trip signal is initiated for each of the reactor trip functions. [NOTE: The test method to verify how a reactor trip signal is initiated will be described here. The test method is dependent upon the system design.] The actuation of reactor trip switchgear is not required for this test.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I11	**Preoperational Test** Protection System Automatic Control – Reactor Trip Actuation Test	The [Protection System] automatically actuates a reactor trip.	A test will be performed of the as-built [Protection System].	The [Protection System] reactor trip breakers open upon an injection of a single simulated [Protection System] reactor trip signal.
	Tier 2 Section 14.3 Discussion Section 7.x describes automatic and manual reactor trips, variables that are monitored to provide input into automatic reactor trip signals, and the features of the reactor trip system. The reactor trip functions are listed in Table 7.x-x and are discussed in Section 7.x. The [Protection System] initiates an automatic reactor trip signal for the reactor trip functions when the associated plant condition(s) exist. The actuation logic for each reactor trip function is discussed in Section 7.x, as well as the input variables for each trip signal. In accordance with Section 14.2.x, a preoperational test demonstrates that the reactor trip breakers open when any one of the automatic reactor trip functions is initiated from the main control room. The reactor trip breakers are only opened once to satisfy this test objective.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I12	**Preoperational Test** Protection System - Reactor Trip Test Verification	The reactor trip logic is designed to fail to a safe state such that loss of electrical power to a protection system division results in a trip condition for that division.	A test will be performed to verify safe states by disconnecting the electrical power to each as-built protection system division.	Loss of electrical power results in a reactor trip condition for that division.
	Tier 2 Section 14.3 Discussion Section 7.x describes the protection system reactor trip logic. Guidance provided in SRP Appendix 7.1-C, Section 5.5, “System Integrity,” states that the design provides for safety systems to fail in a safe state. This preoperational ITAAC test ensures that when the loss of electrical power is detected in a division of the protection system, that division fails to a safe state resulting in a reactor trip condition for that division.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I13	**Preoperational Test** Engineered Safety Features (ESF) Test Verification	The engineered safety features are designed to fail to a predefined safe state.	A test will be performed to verify ESF safe states by disconnecting the electrical power to each as-built protection system division.	Loss of electrical power does not result in an engineered safety features actuation for that division, and the ESFAS components remain in or assume their predetermined safe state as identified in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion Section 7.x describes the protection system engineered safety features logic. Guidance provided in SRP Appendix 7.1-C, Section 5.5, “System Integrity,” states that the design provides for safety systems to fail in a safe state, if conditions such as disconnection of the system, loss of energy, or adverse environments, are experienced. Engineered safety feature actuation system (ESFAS) functions should fail to a predefined safe state. For many ESFAS functions this predefined safe state will be that the actuated component remains as-is. This preoperational ITAAC test ensures that when the loss of electrical power is detected in a division of the protection system, the engineered safety features do not actuate for that division.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I14	**Preoperational Test** Protection System Manual Control – Reactor Trip Actuation Test	The [Protection System] manually actuates a reactor trip.	A test will be performed of the as-built [Protection System].	The [Protection System] reactor trip breakers open when a reactor trip is manually initiated from the main control room.
	Tier 2 Section 14.3 Discussion Section 7.x describes automatic and manual reactor trips, variables that are monitored to provide input into automatic reactor trip signals, and the features of the reactor trip system. A manual reactor trip is one of the [Protection System] manually actuated functions. In accordance with Section 14.2.x, a preoperational test demonstrates that the reactor trip breakers open when a manual reactor trip is initiated from the main control room.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I15	**As-Built Inspection** Protection System Reactor Trip Breakers Arrangement	The reactor trip breakers are arranged such that a failure in one division does not impact the reactor trip function.	An inspection of the as-built reactor trip breakers will be performed.	The reactor trip breakers conform to the arrangement shown in [Figure x.x.x-x].
	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.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I16	<u>**Preoperational Test**</u> Protection System Automatic Control – ESF Signal Initiation Test	The [Protection System] automatically initiates an engineered safety feature actuation signal.	A test will be performed of the as-built [Protection System].	An engineered safety feature actuation signal is automatically initiated for each function listed in [Table x.x.x-x].
	<u>**Tier 2 Section 14.3 Discussion**</u> Section 7.x describes automatic and manual engineered safety features actuation, variables that are monitored to provide input into automatic engineered safety features actuation signals, and the features of the engineered safety feature system(s). The [Protection System] initiates an automatic engineered safety feature actuation signal for the ESF functions when the associated plant condition(s) exist. The actuation logic for each engineered safety feature function is discussed in Section 7.x, as well as the input variables for each actuation signal. In accordance with Section 14.2.x, a preoperational test demonstrates that an automatic engineered safety feature actuation signal is automatically initiated for each of the ESF functions. [NOTE: The test method to verify the initiation of each engineered safety feature actuation signal will be described here. The test method is dependent upon the system design. ESF equipment operation is not required for this test.]			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I17	**<u>Preoperational Test</u>** Protection System Automatic and Manual Control – Engineered Safety Feature Actuation System (ESFAS) Equipment Actuation Test	The [Protection System] actuates the engineered safety feature equipment.	A test will be performed of the as-built ESFAS actuation functions.	i. The [Protection System] actuates the engineered safety feature equipment listed in [Table x.x.x-x] to perform its safety function listed in [Table x.x.x-x] when initiated automatically by its associated [Protection System] signal. ii. The [Protection System] actuates the engineered safety feature equipment listed in [Table x.x.x-x] to perform its safety function listed in [Table x.x.x-x] when initiated manually by its associated [Protection System] signal.
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x describes automatic and manual engineered safety features actuation, variables that are monitored to provide input into automatic engineered safety features actuation, and the features of the engineered safety feature system(s). The Protection System initiates an automatic engineered safety feature actuation signal for the required functions when the associated plant condition(s) exist. The actuation logic for each engineered safety feature function is discussed in Section 7.x, as well as the input variables for each actuation signal. In accordance with Section 14.2.x, a preoperational test demonstrates that when each automatic engineered safety feature function is initiated, the equipment receiving the actuation signal performs its safety function. [NOTE: The test method to verify an engineered safety feature actuation will be described here. The test method is dependent upon the system design.] The Protection System is capable of providing a manual engineered safety feature actuation signal for the functions as described in [Section 7.x]. In accordance with Section 14.2.x, a preoperational test demonstrates that when each manual engineered safety feature function listed in [Tier 1 Table x.x.x-x] is initiated, the equipment receiving the actuation signal performs its safety function [as listed in [Tier 1 Table x.x.x.-x or as described in Section 7.x].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I18	**Preoperational Test** Protection System Completion of Protective Actions Test	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 as-built [Protection System] reactor trip and engineered safety features signals.	i. Upon initiation of a [Protection System] [reactor trip signal], the reactor trip circuit breakers open and do not automatically close when the [Protection System] signal is reset. ii. Upon initiation of a [Protection System] [engineered safety feature actuation signal], the engineered safety features (ESF) equipment actuates to perform its safety function and continues to maintains its safety position and perform its safety function when the [Protection System] signal is reset.
	Tier 2 Section 14.3 Discussion 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: • on a [Protection System] reactor trip signal, the reactor trip breakers open and do not automatically close when the [Protection System] reactor trip signal is reset; and • on a [Protection System] engineered safety feature actuation signal, the ESF equipment actuates to perform its safety function and continues to maintain its safety position and perform its safety function when the [Protection System] signal is reset.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I19	**<u>Preoperational Test</u>** Response Time Testing of ESF Equipment Actuation and Reactor Trip Test	The [protection system] response times from sensor output through equipment actuation for the reactor trip functions and engineered safety feature functions are less than the value required to satisfy the design basis safety analysis response time assumptions.	A test will be performed of the as-built [protection system] reactor trip and engineered safety features function response times.	The response times of the [protection system] reactor trip functions and engineered safety features functions listed in [Table x.x.x-x] are less than or equal to the response times listed in [Table x.x.x-x].
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x describes the reactor trip signals and required response times for each reactor trip variable. Reactor trip response time is defined in Technical Specification Section 1.1 Definitions as [The RTS RESPONSE TIME is that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage.] In accordance with Section 14.2.x, a preoperational test is performed to verify that the measured time for the reactor trip function is less than or equal to the maximum values assumed in the accident analysis. Technical Specification Section 1.1 Definitions states that [the response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.]. --- Section 7.x describes the signals and initiating logic for each engineered safety feature and the required response times. Engineered safety feature response time is defined in Technical Specification Section 1.1 Definitions as [The ESF RESPONSE TIME is that time interval from when the monitored parameter exceeds its actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.).] In accordance with Section 14.2.x, a preoperational test is performed to verify that the measured engineered safety feature response time is less than or equal to the maximum values assumed in the accident analysis. Technical Specification Section 1.1 Definitions states that the response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I20	**<u>Preoperational Test</u>** Protection System Operating Bypass Test	The [Protection System] automatically removes the [operating bypasses] of the reactor trip and engineered safety feature actuation system when the permissive conditions are not met; and automatically inserts the [operating bypasses] when the permissive conditions are met.	A test will be performed of the as-built [Protection System] [operating bypasses].	The [Protection System] [operating bypasses] listed in [Table x.x.x-x] are automatically removed when a test signal simulates that the associated permissive condition is not met; and are automatically inserted when the test signal simulates that the associated permissive condition is met.
	<u>Tier 2 Section 14.3 Discussion</u> NOTE: The term “block” may be used as an alternate term to “operating bypasses” in specific designs. Section 7.x describes [Protection System] operating bypasses for reactor trip functions. Section 7.x describes [Protection System] operating bypasses for engineered safety feature actuations. The operating bypasses are applied either automatically when plant conditions dictate that the safety function is not needed, or that the safety function prevents proper plant operation at a specific mode of operation. In accordance with Section 14.2.x, a preoperational test is performed to verify that the as-built [Protection System] [blocks or operating bypasses] are automatically removed when a test signal simulates that the associated permissive condition is not met; and are automatically inserted when the test signal simulates that the associated permissive condition is met.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I21	**Preoperational Test** Maintenance Bypass Test	The [Protection System] is capable of performing its safety functions when one of its divisions is placed in maintenance bypass.	A test will be performed of each as-built Protection System division.	The Protection System performs its safety functions when a division is placed in maintenance bypass.
	Tier 2 Section 14.3 Discussion Section 7.1.x describes the [Protection System] maintenance bypass operation mode. An individual channel (division) can be placed in a maintenance bypass operation mode to allow manual testing and maintenance during power operation, while ensuring that the minimum redundancy required by the technical specifications is maintained. When a [Protection System] channel with [two-out-of-four] coincidence logic is placed in maintenance bypass operation, the logic of the reactor trip function reverts to a [one-out-of-three] coincidence logic and the logic of an engineered safety features actuation function reverts to a [two-out-of-three] coincidence logic. The reactor trip functions are listed in Table 7.x-x and are discussed in Section 7.x. The engineered safety features actuation signals are listed in Table 7.x-x and are discussed in Section 7.x. In accordance with Section 14.2.x, a preoperational test demonstrates that the [Protection System] [two-out-of-four] coincidence logic reverts to a [one-out-of-three, two-out-of-three] coincidence logic when a [Protection System] channel is placed in bypass. Each channel of the reactor trip functions listed in Table 7.x-x and each channel of the engineered safety features actuation signals listed in Table 7.x-x is tested by placing the channel in maintenance bypass and verifying the resultant coincidence logic is [one-out-of-three, two-out-of-three].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I22	**Preoperational Test** Protection System Bypass Indication Test	Bypassed and inoperable [YYY system] indications are indicated in the main control room.	A test will be performed of each bypassed and inoperable [YYY system] channel.	The bypassed or inoperable [YYY System] channel is indicated in the main control room.
	Tier 2 Section 14.3 Discussion Section 7.x describes the [Protection System] maintenance bypass operation mode. An individual channel (division) can be placed in a maintenance bypass operation mode to allow manual testing and maintenance during power operation, while ensuring that the minimum redundancy required by the Technical Specifications is maintained. Section 7.x discusses the bypassed and inoperable status indication of [Protection System] channels placed in maintenance bypass operation mode. In accordance with Section 14.2.x, a preoperational test demonstrates that each bypassed [Protection System] channel is indicated in the main control room.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I23	**Preoperational Test** Protection System Interlocks Test	The [Protection System] provides interlocks important to safety that function as required when associated conditions are met.	A test will be performed of the as-built [Protection System] interlocks important to safety.	The as-built [Protection System] interlocks listed in [Table x.x.x-x] function as required when test signals simulate that the associated conditions are met.
	Tier 2 Section 14.3 Discussion Section 7.x describes [Protection System] interlocks that reduce the probability of occurrence of specific events, or maintain safety systems in a state that provides reasonable assurance of their availability. Interlocks are applied automatically when plant conditions dictate that the safety function is not needed, or that the safety function prevents proper plant operation at a specific mode of operation. When plant conditions dictate that an interlock be activated, the interlock signal is generated by the [Protection System]. When plant conditions are such that an interlock can be removed, the [Protection System] removes the interlock signal which allows the actuator to be influenced by other control systems. In accordance with Section 14.2.x, a preoperational test is performed to verify that the [Protection System] interlocks] function as required when test signals simulate that the associated conditions are met.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I24	**As-Built Inspection** Main Control Room and [Remote Shutdown Station] Displays and Alarms	The [XXX system] Displays and Alarms are indicated on the [XXX] operator workstations in the MCR and [RSS].	i. An inspection will be performed for the ability to retrieve the [XXX system] as-built displays and alarms on the [XXX] operator workstation in the MCR. ii. An inspection will be performed for the ability to retrieve the [XXX system] as-built displays and alarms on the [XXX] operator workstation in the [Remote Shutdown Station].	i. The [XXX system] displays and alarms listed in [Table x.x.x-x] are retrieved and displayed on the [XXX] operator workstation in the MCR. ii. The [XXX system] displays and alarms listed in [Table x.x.x-x] are retrieved and displayed on the [XXX] operator workstation in the [RSS].
	Tier 2 Section 14.3 Discussion [Section x.x] describes the [XXX system] Displays and Alarms indicated on the [XXX] 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 [XXX] work station in the main control room and [remote shutdown station] will be performed.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I25	**Preoperational Test** [XXX system] controls located on the [YYY] operator workstations in the MCR and [RSS]	The [XXX system] controls located on the [YYY] operator workstations in the MCR and [RSS] operate to perform their required function(s).	i. Tests will be performed of the [XXX system] controls on the [YYY] operator workstations in the MCR. ii. Tests will be performed of the [XXX system] controls on the [YYY] operator workstations in the [RSS].	i. The [XXX system] controls provided on the [YYY] operator workstations in the MCR perform the functions listed in [Table x.x.x-x]. ii. The [XXX system] controls provided on the [YYY] operator workstations in the [RSS] perform the functions listed in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion [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] components can be manually operated from the [XXX] operator workstations in the main control room and [remote shutdown station].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I26	**As-Built Inspection** Minimum number and locations of sensors	The [protection system] is provided with the minimum number and locations of sensors required for protective variables that have spatial dependence.	An inspection will be performed of the as-built spatial dependent equipment.	The minimum number of spatial dependent equipment sensors are installed at the locations specified in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion Section [x.x] discusses the spatial dependent equipment and the minimum number and location of the sensors. Guidance provided in SRP, Appendix 7.1-C, "Guidance for Evaluation of Conformance to IEEE Std 603," Section 4, discusses Clause 4.6 of IEEE Std 603-1991, and states that the applicant's analysis should demonstrate that the number and location of sensors are adequate. This ITAAC verifies that the correct number of sensors are installed and the sensors are located in the proper locations.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I27	**<u>Preoperational Test</u>** Self-testing features	The [XXX System] self-test features detect faults in the system and provide an alarm in the main control room and [remote shutdown station].	Tests will be performed of the as-built [XXX System] self-test features.	i. Self-testing features verify that faults requiring detection are detected. ii. Self-testing features verify that upon detection, the system responds according to the type of fault. iii. Self-testing features verify that faults are detected and responded within a sufficient timeframe to ensure safety function is not lost. iv. Alarms and indications in the main control room and remote shutdown station indicate the type of fault present.
	<u>Tier 2 Section 14.3 Discussion</u> 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 ITACC 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 [XXX 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 [XXX 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 in the main control room and remote shutdown station indicate the type of fault present.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
I28	**<u>Setpoint Analysis</u>** Protection system setpoint determination	[Protection system] setpoints associated with automatic reactor trip functions and the automatic engineered safety features functions are determined using the approved setpoint methodology.	An analysis will be performed to verify that [Protection System] setpoints are determined using the approved setpoint methodology.	The protection system setpoints calculations conformed to the approved setpoint methodology:
	<u>Tier 2 Section 14.3 Discussion</u> Section 7.x discusses the methodologies to be used to determine the protection system setpoints. BTP 7-12 and Regulatory Guide 1.105 provide guidance on setpoint analyses and determinations. This ITAAC analysis verifies that the setpoints are calculated according to the approved setpoint methodology, which the applicant has committed to using.			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">HB01</td><td><u>As-built Inspection</u>
Fire and Smoke Barriers</td><td>[Fire and smoke barriers provide confinement so that the impact from [internal fires, smoke, hot gases, fire suppressants] is contained within the [YYY structure] fire area of origin.</td><td>An inspection will be performed of the [YYY structure] as-built fire and smoke barriers and their qualification documentation.</td><td>The following [YYY structure] fire and smoke barriers are installed and qualified for their intended use:

1. [Fire-rated doors] as described in [Table x.x.x-x or Figure x.x.x-x].

2. [Fire-rated walls] as described in [Table x.x.x-x or Figure x.x.x-x].

3. [Fire-rated penetration seals] as described in [Table x.x.x-x or Figure x.x.x-x].

4. Smoke barriers are installed to prevent spread of smoke and fire suppression-extinguishing agents to redundant divisions or trains of safety-related systems.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Section 9.5 discusses that fire barriers separate: (1) Safety-related systems from any potential fires in nonsafety-related areas that could affect the ability of safety-related systems to perform their safety-related function. (2) Redundant divisions or trains of safety-related systems from each other to prevent damage that could adversely affect a safe shutdown function from a single fire. (3) Equipment within a single safety-related electrical division that present a fire hazard to equipment in another safety-related division. (4) Electrical circuits (safety-related and nonsafety-related) whose fire-induced failure could cause a spurious actuation that could adversely affect a safe shutdown function.
An ITAAC inspection is performed to verify that the following [YYY structure] qualified fire barriers and smoke barriers are installed: fire-rated doors, fire-rated walls, fire-rated penetration seals, and smoke barriers.
The objective of the inspection is to verify the existence, location and rating of the fire and smoke barriers by visual and document inspection. The inspection should also include review of the as-built drawings and the verification of detailed installation features by recording the listed design number(s) and configuration(s), and verifying, using non-destructive means, the as-built fire barriers meet the listed design(s) (e.g., materials of construction, assembly, basic dimensions, fire rating).</td></tr>
</table>

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
HB02	**As-built Inspection** Internal Flood Protection/Flooding Barriers	[YYY structure] internal flooding barriers protect against internal flooding hazards.	An inspection will be performed of the [YYY structure] as-built internal flooding barriers and qualification documentation.	The following [YYY structure] internal flooding barriers are installed and qualified for their intended use: 1. [Watertight doors] as described in [Table x.x.x-x or Figure x.x.x-x]. 2. [Curbs and sills] as described in [Table x.x.x-x or Figure x.x.x-x]. 3. [Walls] as described in [Table x.x.x-x or Figure x.x.x-x]. 4. [Water tight penetration seals] as described in [Table x.x.x-x or Figure x.x.x-x].
	Tier 2 Section 14.3 Discussion 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 as-built [YYY structure] internal flooding barriers are installed per their design requirements: watertight doors, curbs, sills, walls, and watertight penetration seals. 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.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
HB03	**<u>As-built Inspection</u>** External Flood Protection/ Site Grade Level	The site grade level protects the Seismic Category I [YYY structure] against external flooding in order to prevent flooding of safety-related SSCs within the structure.	An inspection will be performed of the as-built site grade level and [YYY structure] as-built floor elevation at ground entrances.	The site grade level is located at least [### in] below the [YYY structure] floor elevation at ground entrances.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.4.1.x discusses that Seismic Category I structures that may be subjected to the design basis flood are designed to withstand the maximum external flood level to protect safe shutdown equipment within the structure. An ITAAC inspection is performed to verify that the as-built site grade level is located at least [### in] below the as-built [YYY structure] floor elevation at ground entrances as documented on associated as-built design drawings.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
HB04	As-built Inspection Internal Flood Protection/Flooding Barriers	[Safety-related or RTNSS] components located in the [YYY structure] are located above the internal design flood level or are qualified for submergence.	An inspection will be performed to verify that the as-built [safety-related or RTNSS] components are located above the internal design flood level, or qualified for submergence.	The [safety-related or RTNSS] components located in the [YYY structure] are located above the internal design flood elevation of [xx ft.], or an Equipment Qualification Data Package concludes that the components are qualified for submergence.
	<u>Tier 2 Section 14.3 Discussion</u> An ITAAC inspection will be performed to verify that the as-built [safety-related or RTNSS] components are either (1) located above the compartment’s internal design flood level, or (2) qualified for submergence in accordance with the licensee’s equipment qualification programs discussed in [sections 3.9, 3.10 and 3.11].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
HB05	**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 SSCs within the structure.	An inspection will be performed of the [YYY structure] as-built exterior flooding barriers and qualification documentation.	The following [YYY structure] exterior flooding barriers are installed and qualified for their intended use: 1. [Water stops in expansion and construction joints located below design basis maximum flood and groundwater levels.] 2. [Waterproofing of exterior surfaces located below design basis maximum flood and groundwater levels.] 3. [Watertight seals in exterior wall or floor penetrations located below design basis maximum flood and groundwater levels.]
	Tier 2 Section 14.3 Discussion 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. These provisions include: Water stops provided in expansion and construction joints below design basis maximum flood and groundwater levels. Waterproofing of external surfaces below design basis maximum flood and groundwater levels. Watertight seals in exterior walls or floors penetrations below design basis maximum flood and groundwater levels. An ITAAC inspection is performed to verify that the following [YYY structure] as-built exterior flooding barriers are installed in accordance with the approved design: [Water stops in expansion and construction joints located below design basis maximum flood and groundwater levels.] [Waterproofing of exterior surfaces located below design basis maximum flood and groundwater levels.] [Watertight seals in exterior walls or floors penetrations located below design basis maximum flood and groundwater levels.] The objective of the inspection is to verify the installation and location of the flooding barriers and that they are qualified for their intended use by visual inspection and review of as-built drawing(s) and the qualification documentation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
F01	**<u>As-built Inspection</u>** Minimum Capacity of the Fire Protection System Water Source *{For use in the case of separate FWSTs}*	A minimum of two separate firewater storage tanks (FWSTs) provides a dedicated volume of water for fire fighting.	An inspection will be performed of the as-built FWSTs.	Two separate firewater storage tanks exist and each provides a usable water volume dedicated for fire fighting equal to or greater than 300,000 gallons.
	<u>Tier 2 Section 14.3 Discussion</u> Section 9.5.1 provides a discussion of how the site fire protection water supply system meets the guidance provided by Regulatory Guide 1.189 and applicable NFPA standards. An ITAAC inspection is performed to verify that the minimum usable water volume is greater than or equal to 300,000 gallons per tank. If the firewater storage tanks are also used as backup water sources for other non-fire emergencies, the ITAAC inspection verifies that the non-fire emergencies cannot drain the tank below the minimum dedicated useable water volume of 300,000 gallons required for fire fighting.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
F02	**<u>As-built Inspection</u>** Minimum Capacity of the Fire Protection System Water Source *{For a large common water supply}*	A minimum of two redundant and separated freshwater intake suctions, for the fire protection system fire pumps, is provided in one or more intake structures.	An inspection of the as-built freshwater intake suction sources will be performed.	Two or more redundant freshwater intake suction sources (1) are provided for the fire protection system's fire pumps, and (2) are separated, such that the failure of one supply will not result in failure of the other supply.
	<u>Tier 2 Section 14.3 Discussion</u> Tier 2 Section 9.5.1 provides a discussion of how the site fire protection water supply system meets the guidance provided by Regulatory Guide 1.189 and applicable NFPA standards. An ITAAC inspection is performed to verify that the minimum redundant and separated intake suction sources are available from an acceptable common water source in one or more intake structures. These sources should be separated, so that failure of one supply will not result in failure of the other supply.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
F03	**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 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 in a fire area different than the main control room fire area and are located as identified in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion Section [7.4.x] provides a discussion of how the capability to transfer control from the main control room to the remote shutdown [station] exists in a fire area different than the main control room fire area. An ITAAC inspection is performed of each installed transfer switch location to verify that the switch exists in a fire area different than the main control room fire area.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
F04	**Preoperational Test** Fire Protection System Pump Flow Test	The fire protection system (FPS) has a sufficient number of fire pumps to provide the design flow requirements to satisfy the flow demand for the largest sprinkler or deluge system plus an additional 500 gpm for fire hoses assuming failure of the largest fire pump or loss of off-site power.	i. An analysis will be performed of the as-built fire pumps. ii. A test of the as-built fire pumps will be performed.	i. The fire pumps can provide the flow demand for the largest sprinkler or deluge system plus an additional 500 gpm for fire hoses assuming failure of the largest fire pump or loss of off-site power. ii. The fire pumps deliver the minimum flow rate identified in [Table X.X.X-X].
	Tier 2 Section 14.3 Discussion Section 9.5.1 provides a discussion of how the capacity of each [Fire Protection System] pump is adequate to supply a [insert criteria]. In accordance with Section 14.2.x, a preoperational test demonstrates that each [Fire Protection System] pump can deliver a minimum flow of [### gpm] to the [Fire Water Distribution System].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
F05	**<u>As-Built Inspection and Analysis</u>** Post-Safe Shutdown Earthquake Fire Protection System Function	The fire protection system piping and components serving safety-related areas 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 safety-related areas.	An inspection and analysis will be performed of the as-built fire protection system piping and components serving safety-related areas.	The fire protection system piping and components listed in [Table x.x.x-x] which serve safety-related areas are seismically qualified to withstand the effects of the safe shutdown earthquake without loss of function or pressure boundary integrity.
	<u>Tier 2 Section 14.3 Discussion</u> Section 9.x provides a discussion of how the fire protection system piping and components that serve safety-related areas 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 safety-related areas. An inspection and analysis will be performed of the as-built fire protection system piping and components serving safety-related areas to verify that the fire protection system piping and components that serve safety-related areas are seismically qualified to withstand the effects of the SSE without loss of function or pressure boundary integrity.			

No.	ITAAC Category/Type	Design Commitment	Inspection, Test, Analyses	Acceptance Criteria
F06	**<u>As-built Inspection and Analyses</u>** Enhanced Fire Protection Safe-Shutdown Capability	Safe-shutdown can be achieved assuming that all equipment in any one fire area (except for the main control room (MCR) and containment) is rendered inoperable by fire and that reentry into the fire area for repairs and operator actions is not possible. Additionally, smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions.	An inspection and safe-shutdown analysis of the as-built plant will be performed, including a post-fire safe-shutdown circuit analysis performed in accordance with RG 1.189 [and NEI 00-01] for all possible fire-induced failures that could affect the safe-shutdown success path, including multiple spurious actuations.	A safe-shutdown analysis report exists and concludes: 1. That at least one safe-shutdown success path remains free of fire damage for a single fire in any single plant fire area (except for the main control room and containment), 2. Smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions, 3. Fire protection features for the redundant shutdown systems in reactor containment ensure that one shutdown division will be free of fire damage, and 4. An independent alternative shutdown capability that is physically and electrically independent of the MCR exists.
	<u>Tier 2 Section 14.3 Discussion</u> Section 9.x discusses that safe-shutdown can be achieved assuming that all equipment in any one fire area (except for the main control room (MCR) and containment) is rendered inoperable by fire and that reentry into the fire area for repairs and operator actions is not possible. Additionally, smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions. An inspection and safe-shutdown analysis of the as-built plant will be performed, including a post-fire safe-shutdown circuit analysis performed in accordance with RG 1.189 [and NEI 00-01] for all possible fire-induced failures that could affect the safe-shutdown success path, including multiple spurious actuations. The inspection and safe-shutdown analysis will verify (1) that safe-shutdown can be achieved assuming that all equipment in any one fire area (except for the MCR and containment) is rendered inoperable by fire and that reentry into the fire area for repairs and operator actions is not possible and (2) that smoke, hot gases, or fire suppressant cannot migrate from the affected fire area into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions.			

No.	ITAAC Category/Type	Design Commitment	Inspection, Test, Analyses	Acceptance Criteria
F07	**<u>As-built Inspection and Analyses</u>** Fire Hazards Analysis	A plant fire hazards analysis considers all potential fire hazards and ensures the fire protection features in each fire area are suitable for the hazards.	An inspection and fire hazards analysis of the as-built plant will be performed in accordance with RG 1.189 for all potential fires.	A fire hazards analysis report exists and concludes: 1. Combustible loads and ignition sources are accounted for, and 2. Fire protection features are suitable for the hazards they are intended for.
	<u>Tier 2 Section 14.3 Discussion</u> Appendix 9A discusses the methodology and presents the fire hazards analysis (FHA) for each fire area. The final FHA must reflect the as-built configuration of the plant. The FHA is an analysis of the fire hazards, including combustible loading and ignition sources, and analysis of the fire protection features required to mitigate each postulated fire. An inspection and fire hazards analysis of the as-built plant will be performed in accordance with RG 1.189, as described in Appendix 9A, for all potential fires. The inspection and fire hazards analysis will verify (1) combustible loads and ignition sources are accounted for, and (2) fire protection features are suitable for the hazards they are intended for.			

Mxx – Mechanical ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M01	**<u>As-Built Inspection</u>** Reactor Pressure Vessel Surveillance Specimen Guide Baskets	The reactor pressure vessel (RPV) is provided with irradiation specimen guide baskets to hold a capsule containing RPV material surveillance specimens.	An inspection will be performed of the as-built reactor pressure vessel irradiation specimen guide baskets.	[###] guide baskets are installed in the reactor vessel beltline region as shown in [Figure x.x.x-x].
	<u>Tier 2 Section 14.3 Discussion</u> Section 5.3.x, Material Surveillance, discusses the use of specimen capsules installed in specimen guide baskets. An ITAAC inspection is performed to verify that the correct number of guide baskets are installed in the reactor pressure vessel beltline region at the locations shown in [Figure x.x.x-x].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M02	**<u>Preoperational Test and As-Built Inspection</u>** Reactor Pressure Vessel Internals Flow Induced Vibration {PWR ONLY}	The reactor pressure vessel internals withstand the effects of flow-induced vibration.	A pre-test inspection, hot functional flow test, and a post-test inspection will be conducted on the as-built reactor pressure vessel internals.	The reactor pressure vessel internals have no observable damage or loose parts after hot functional flow testing.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.9.x, describes the flow-induced vibration testing and assessment of the dynamic response of the reactor vessel internals to flow-induced vibration. The reactor internals are disassembled and inspected prior to and at the completion of pre-core load hot functional testing. Testing of the reactor internals for flow-induced vibration is performed during pre-core load hot functional testing using the guidance of Regulatory Guide 1.20, “Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing.” A preoperational test and as-built inspection, described in Section 14.2.X, is performed to verify that flow induced vibration during hot functional testing does not result in observable damage or loose parts to the reactor internals.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M03	**<u>Preoperational Test and As-Built Inspection and Analysis</u>** [Reactor Pressure Vessel] Internals Flow Induced Vibration {BWR ONLY}	The [reactor pressure vessel] internals withstand the effects of flow-induced vibration.	i. An pre-test inspection, hot functional flow test, and post-test inspection will be performed on the as-built [reactor pressure vessel] internals. ii. An inspection and analysis will be performed of the steam dryer pressure sensors installed for startup testing. iii. Inspection and analysis will be performed of the steam dryer strain gages and accelerometers installed for startup testing.	i. The [reactor pressure vessel] internals have no observable damage or loose parts after hot functional flow testing. ii. The number and location of steam dryer pressure sensors will ensure accurate pressure predictions at the steam dryer critical locations. iii. 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.

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M03			iv. A Fatigue Analysis of the as-built steam dryer will be performed using an NRC-approved methodology. v. Inspection and analysis will be performed to verify the acoustic resonance of the as-built main steam lines and SRV/SV branch piping for normal plant operating conditions.	iv. 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). v. 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.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.9.x, Preoperational Flow-Induced Vibration Testing of Reactor Internals, describes the assessment of the dynamic response of the reactor pressure vessel internals to flow-induced vibration. Testing of the reactor internals to flow-induced vibration is performed during pre-core load hot functional testing and during post-core load power ascension testing using the guidance of Regulatory Guide 1.20, “Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing.” At the completion of pre-core load hot functional testing, performed in accordance with Section 14.2.x, the reactor pressure vessel internals are disassembled and inspected. An ITAAC inspection of the reactor pressure vessel internals is conducted to verify that the reactor pressure vessel internals have no observable damage or loose parts following hot functional testing. Inspections and analysis are also performed to support installing test equipment to monitor the steam dryer during critical operations, to perform a Fatigue Analysis of the as-built steam dryer, and to evaluate the acoustic resonance of the as-built main steam lines and SRV/SV branch piping during normal operation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M04	**Preoperational Test** [Safety-Related or RTNSS] Pump Preoperational Flow Test	The [XXX system] [safety-related or RTNSS] pumps provide the required flow to [insert design criteria].	A test will be performed of the as-built pumps while operating in a [specified operating mode or system lineup].	Each [XXX system] pump listed in [Table x.x.x-x] delivers a minimum flow of [### gpm] while operating in a [specified operating mode or system lineup].
	Tier 2 Section 14.3 Discussion Section [XXX] provides the minimum flow of [XXX system] [safety-related or RTNSS] pumps to perform its function important to safety while operating in a [specified operating mode or system lineup]. In accordance with Section 14.2.x, a preoperational test verifies the minimum pump flow rate of each pump while operating in the [specified operating mode or system lineup].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M05	**Preoperational Test and Analysis** [Safety-Related or RTNSS] Pump NPSH Test	The [XXX system] [safety-related or RTNSS] 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 and analysis will be performed to verify the net positive suction head (NPSH) for the as-built pumps, under the limiting design conditions.	Each [XXX system] pump listed in [Table x.x.x-x] has a NPSHA that is greater than or equal to the NPSHR under the limiting design conditions.
	Tier 2 Section 14.3 Discussion The NPSH required by a pump must be less than or equal to the NPSH available under all operating conditions to prevent cavitation of the pump. Preoperational test conditions are established that approximate design conditions to the extent practical, consistent with preoperational test limitations. In accordance with Section 14.2.x, a preoperational test and analysis verifies that the NPSH available to each [XXX system] pump is greater than or equal to the required NPSH under the limiting design conditions (i.e. temperature, pressure, flow, strainer blockage) on the NPSHA.			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">M06</td><td><u>Preoperational Test</u>
[Safety-Related or RTNSS] Valve Preoperational Test</td><td>The [XXX system] valves with an active [safety-related or RTNSS] function change position under normal operating system temperature, differential pressure and flow.</td><td>A test will be performed to verify each valve can be stroked fully open and closed by remote operation under normal operating temperature, differential pressure and flow.</td><td>Each [XXX system] valve listed in [Table x.x.x-x] with an active [safety-related or RTNSS] function is stroked fully open and fully closed by remote operation under normal operating temperature, differential pressure and flow.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
The [XXX system] [safety-related or RTNSS] valves are tested by remote operation to demonstrate the capability to perform their function to transfer open and transfer closed under normal operating temperature, differential pressure and flow.
In accordance with Section 14.2.x, a preoperational test verifies that the [XXX system] [safety-related or RTNSS] valves stroke fully open and fully closed by remote operation under normal operating temperature, differential pressure and flow.</td></tr>
</table>

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">M07</td><td><u>Preoperational Test</u>
[Safety-Related or RTNSS] Check Valve Preoperational Test</td><td>The [XXX system] check valves with an active [safety-related or RTNSS] function perform an active function to open and close under normal operating temperature, differential pressure and flow.</td><td>Tests will be performed in the forward and reverse flow directions to verify that each check valve with an active [safety-related or RTNSS] function changes position under normal operating temperature, differential pressure and flow.</td><td>The [XXX system] check valves listed in [Table x.x.x-x] with an active [safety-related or RTNSS] function open and close under forward and reverse flow conditions, respectively, at normal operating temperature, differential pressure and flow.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
The [XXX system] check valves are tested to demonstrate the capability to perform their function to transfer open and transfer closed.
In accordance with Section 14.2.x, a preoperational test verifies that the [XXX system] check valves will change position under forward and reverse flow conditions at normal operating temperature, differential pressure and flow preoperational test conditions.</td></tr>
</table>

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M08	**<u>Preoperational Test</u>** [Safety-Related or RTNSS] Air-Operated Valve Fail Position on Loss of Motive Power Test	The [XXX system] [safety-related or RTNSS] air-operated valves perform an active function to fail to or maintain their safety position on loss of motive power under normal operating temperature, differential pressure and flow.	Tests of the air-operated valves will be performed to verify that the valves fail to or maintain their safety position on loss of motive power under normal operating temperature, differential pressure and flow.	The [XXX system] air-operated valves listed in [Table x.x.x-x] fail to or maintain their safety position on loss of motive power under normal operating temperature, differential pressure and flow.
	<u>Tier 2 Section 14.3 Discussion</u> The [XXX system] [safety-related or RTNSS] air-operated valves are tested to demonstrate the capability to perform their function to fail to or maintain their safety position on loss of motive power. In accordance with Section 14.2.x, a preoperational test verifies that the [XXX system] [safety-related or RTNSS] air-operated valves transfer to or maintain their safety 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) under normal operating temperature, differential pressure and flow.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M09	**<u>As-built Inspection</u>** [Safety-Related or RTNSS] [Accumulator or Tank] Volume	The [XXX system] [Safety-Related or RTNSS] [accumulator(s) or tank(s)] provide a minimum water volume for [insert criteria].	An inspection of the as-built [accumulator(s) or tank(s)] will be performed.	The usable water volume of each [XXX system] [accumulator or tank] listed in [Table x.x.x-x] is greater than or equal to [### gallons].
	<u>Tier 2 Section 14.3 Discussion</u> Section x.x discusses that the [XXX system] [accumulator or tank] provides a water volume for the [safety-related or RTNSS] function of [insert criteria]. An ITAAC inspection is performed to verify that each [XXX system] [safety-related or RTNSS] [accumulator or tank] useable water volume is greater than or equal to [### gallons].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M10	**<u>As-built Inspection and Analysis</u>** High Point Vent Valve Installation Verification	High point vent valves are installed in the [XXX system] piping high points to allow venting of non-condensable gases and steam from the system.	An inspection and analysis of the as-built [XXX system] high point vent valve locations will be performed.	High point vent valves are installed in the [XXX system] at the required piping system high point locations to allow proper venting of non-condensable gases and steam from the piping system.
	<u>Tier 2 Section 14.3 Discussion</u> Section 5.4.x discusses that the [XXX system] high point vent valves can remove non-condensable gases or steam from the [XXX system] to mitigate a possible condition of inadequate core cooling resulting from the accumulation of non-condensable gases in the [XXX system]. An ITAAC inspection and analysis is performed to verify that the [XXX system] as-built high point vent valves are installed at the required locations to allow proper venting of non-condensable gases or steam from the piping system.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M11	**<u>Vendor Test</u>** RCP Flywheel Integrity Overspeed Test	The reactor coolant pump (RCP) flywheel maintains its structural integrity during an overspeed event equal to 125 percent of the motor's design speed.	A test will be performed on each as-built RCP flywheel by the vendor to an overspeed condition of greater than or equal to [### rpm].	Each RCP flywheel maintained its structural integrity during overspeed testing at greater than or equal to [### rpm].
	<u>Tier 2 Section 14.3 Discussion</u> Section 5.4.x discusses that each Reactor Coolant Pump flywheel is tested during manufacture to an overspeed condition of at least 125 percent of the design speed of the flywheel, in accordance with Regulatory Guide 1.14, to verify the flywheel's structural integrity. The design speed of the flywheel is defined to be motor design speed. A vendor factory test verifies that each RCP flywheel maintains structural integrity up to 125 percent of the motor's design speed which is equivalent to [### rpm]			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M12	**Preoperational Test and Analysis** [Safety-Related or RTNSS] HVAC Design Temperature Control	The [XXX system] provides conditioned air to the [YYY structure/room] to maintain area temperatures within design limits during normal operation, abnormal, and design basis accident conditions of the plant.	Tests and analysis will be performed to verify the heating and cooling capability [of each division] of the [XXX system].	Each division of the [XXX system] is capable of providing conditioned air to maintain area temperatures within the design limits in the rooms listed in [Table x.x.x-x] during normal operation, abnormal, and design basis accident conditions of the plant.
	Tier 2 Section 14.3 Discussion Section [6.4.x or 9.4.x] provides a description of the [XXX system] operation to provide the function to control the temperatures in [YYY rooms] in the [ZZZ structure]. The design basis temperatures of the rooms are provided in [Section xxx, Table x.x-x, Figure x.x-x]. A test and analysis is performed to verify that the [heating/cooling] capability of the as-built [XXX system] can maintain area temperatures within the design temperature limits for the [YYY rooms] in the [ZZZ structure], during normal operation, abnormal, and design basis accident conditions of the plant			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M13	**AS-Built Inspection** HVAC System ASME Code AG-1 conformance	The [XXX system] equipment identified as ASME Code AG-1 is fabricated, installed, inspected, and tested in accordance with ASME Code AG-1 standards.	Inspection of the construction activities and as-built documentation for the ASME Code AG-1 equipment will be performed.	A report exists and concludes that ASME Code AG-1 equipment listed in [Table x.x.x-x] is fabricated, installed, inspected, and tested in accordance with ASME Code AG-1 standards.
	Tier 2 Section 14.3 Discussion Section [XX] discusses the [XXX system] conformance to ASME Code AG-1. An ITAAC inspection of the construction activities and as-built documentation is performed to verify the [XXX System] equipment conforms to the rules for construction of ASME Code AG-1.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M14	**Preoperational Test** [XXX System] [Safety-Related or RTNSS] Fan Flow Test	The [XXX system] [Safety-Related or RTNSS] fans provide the flow rate required to perform their [Safety-Related or RTNSS] function during design basis accident conditions.	A test will be performed of each fan while operating in a [specified operating mode or system lineup].	The [XXX system] [Safety-Related or RTNSS] fans listed in [Table x.x.x-x] provide a minimum airflow rate of [### SCFM] while operating in a [specified operating mode or system lineup].
	Tier 2 Section 14.3 Discussion [Section xx] provides the design airflow for the [XXX system] [safety-related or RTNSS] functions while operating in a [specified operating mode or system lineup]. In accordance with Section 14.2.x, a preoperational test verifies that each [XXX system] [safety-related or RTNSS] fans provide a minimum flow of [### SCFM] while operating in a [specified operating mode or system lineup].			

M15	**Preoperational Test** [Safety-Related or RTNSS] Remotely Operated Damper Functional Test	The [XXX system] dampers with an active [safety-related or RTNSS] function change position under normal operating temperature, differential pressure and flow.	A test will be performed to verify each damper can be stroked fully open and closed by remote operation under normal operating temperature, differential pressure and flow.	Each [XXX system] damper listed in [Table x.x.x-x] with an active [safety-related or RTNSS] function is stroked fully open and fully closed by remote operation under normal operating temperature, differential pressure and flow.
	Tier 2 Section 14.3 Discussion The [XXX system] [safety-related or RTNSS] remotely operated dampers are tested to demonstrate the capability to transfer open and transfer closed. In accordance with Section 14.2.x, a preoperational test verifies that the [XXX system] remotely operated dampers change position upon receipt of a manual or automatic initiating signal under normal operating temperature, differential pressure and flow.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M16	**Type Test, Analysis, Preoperational Test and As-Built Inspection** [Safety-Related or RTNSS] Tornado Damper Qualification and Functional Test	The tornado dampers with an active [Safety-Related or RTNSS] function change position under the design basis tornado conditions.	i. A type test or combination of type test and analysis will be performed to verify that the tornado dampers can perform their [safety-related or RTNSS] function under the design basis tornado conditions. ii. Inspection of the as-built tornado dampers will be performed. iii. A test of the as-built tornado dampers will be performed.	i. A report exists and concludes that the tornado dampers identified in [Table x.x.x-x] can perform their active [safety-related or RTNSS] function under design basis tornado conditions. ii. Each tornado damper listed in [Table x.x.x-x] is bounded by the type test or type test and analysis. iii. Each tornado damper listed in [Table x.x.x-x] has freedom of motion.
	Tier 2 Section 14.3 Discussion [Section XX] discusses the tornado dampers [safety-related or RTNSS] function to transfer open and transfer closed for a design basis tornado condition. Type test, analysis, inspections, and test are performed to verify that the tornado dampers change position as required during design basis tornado conditions.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M17	**<u>Preoperational Test</u>** Control Room Envelope Unfiltered Air In-leakage Test	The unfiltered air in-leakage into the control room envelope does not exceed the assumptions in the control room operator dose analysis.	Trace gas testing in accordance with ASTM E741 will be performed to measure the unfiltered in-leakage into the control room envelope with the [XXX system] operating.	The unfiltered in-leakage measured by tracer gas testing does not exceed the unfiltered in-leakage assumed in the control room operator dose analysis.
	<u>Tier 2 Section 14.3 Discussion</u> Testing is performed on the control room envelope (CRE) in accordance with Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, to demonstrate that leakage from adjacent environmental zones into the CRE is limited. Regulatory Guide 1.197 allows two options for CRE testing; either integrated testing or component testing. Section 9.4.1 describes the system design requirements and Section 6.4.x describes the testing requirements for the control room envelope habitability program. In accordance with Section 14.2.x, a preoperational test using the tracer gas test method demonstrates that the unfiltered air in-leakage inside the Control Room Envelope is less than or equal to [### scfm].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M18	**Preoperational Test** Control Room Envelope Pressurization Test	The [XXX system] maintains a positive pressure in the control room envelope relative to the outside environment and adjacent areas, while operating in the design basis accident alignment.	A test will be performed to verify the [XXX system] maintains a positive pressure in the control room envelope relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.	The [XXX system] maintains a positive pressure of greater than or equal to [#### inches water gauge] in the control room envelope relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.
	Tier 2 Section 14.3 Discussion Section 9.4.1 describes the system design requirements and Section 6.4.x describes the testing requirements for the control room envelope habitability program. In accordance with Section 14.2.x, a preoperational test verifies that the [XXX system] can pressurize the control room envelope to [### in wg] to minimize unfiltered air in-leakage.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M19	**Vendor Test** Charcoal Absorber Efficiency Laboratory Testing	The [XXX filtration units] meet the laboratory test standards described in ASME Code AG-1 and RG 1.52 for carbon absorber efficiency.	Each charcoal absorber will be laboratory-tested in accordance with the standards described in ASME Code AG-1 Section FE.	Charcoal absorber efficiency meets the acceptance criteria for laboratory testing per RG 1.52, Regulatory Position 7, when tested in accordance with the standards described in ASME Code AG-1, Section FE.
	Tier 2 Section 14.3 Discussion [Section x.x] describes the system design requirements and [Section x.x] describes the testing requirements for the [XXX system] charcoal adsorption units. A Vendor test verifies that the Charcoal absorber efficiency meets the acceptance criteria for laboratory testing per RG 1.52, Regulatory Position 7, when tested in accordance with the standards described in ASME Code AG-1, Section FE.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M20	**Preoperational Test** Main Control Room Habitability System Automatic Alignment Test	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] to verify the dampers automatically re-align to their required position on receipt of a [required isolation] actuation signal.	Upon receipt of a [required isolation] actuation signal, the [XXX system] dampers automatically align to the position described in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion 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 a [required isolation] signal, the [XXX system] automatically aligns to its required position. A manual signal, actual automatic signal, or simulated automatic signal may be used to initiate the alignment.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M21	**Preoperational Test** Control Room Envelope Ventilation Flow Rate Verification Test	The control room [XXX system] provides design flow to the control room envelope in the event of an emergency.	A test will be performed of the control room [XXX system] while operating in an emergency operating alignment.	Each division of the control room [XXX system] delivers a minimum flow of [### scfm] to the control room envelope while operating in an emergency operating alignment.
	Tier 2 Section 14.3 Discussion [Section 9.4.x] discusses the control room [XXX system] function to provide a minimum flow of air to the control room envelope while operating in an emergency alignment. In accordance with Section 14.2.x, a preoperational test verifies each division of the control room [XXX system] delivers a minimum flow of [### scfm] to the Control Room Envelope while operating in an emergency operating alignment.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M22	**Preoperational Test** [XXX filtration units] In-Place Leak Test	The [XXX filtration units] meet the in-place leakage testing standards of ASME Code AG-1 and RG 1.52.	An in-place leak test of the as-built [XXX filtration units] will be performed in accordance with ASME Code AG-1, Section TA, to meet the standards of RG 1.52	The [XXX filtration units] meet the acceptance criteria for in-place testing per RG 1.52, Regulatory Position 6, when tested in accordance with the standards described in ASME Code AG-1, Section TA.
	Tier 2 Section 14.3 Discussion [Section x.x] describes the system design requirements and [Section x.x] describes the testing requirements for the [XXX system] charcoal adsorption units. The [XXX filtration units] are tested to verify they meet the acceptance criteria for in-place testing per RG 1.52, Regulatory Position 6, when tested in accordance with the standards described in ASME Code AG-1, Section TA.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M23	**Design Analysis** Control Room Envelope Passive Temperature Control Analysis	The Control Room Envelope heat sink passively maintains the temperature of the Control Room Envelope within an acceptable range for the first [72 hours] following a design basis accident.	An analysis will be performed of the as-built Control Room Envelope heat sinks.	The Control Room Envelope bulk average air temperature is less than or equal to [### ºF] on a loss of active cooling for the first [72 hours] following a design basis accident.
	Tier 2 Section 14.3 Discussion Section [xxx] discusses the use of passive heat sinks in the Control Room Envelope to maintain the temperature within the Control Room Envelope within an acceptable range for [the first 72 hours] following a design basis accident. An ITAAC as-built analysis is performed to document that the Control Room Envelope bulk average air temperature is less than or equal to [### ºF] on a loss of active cooling [for the first 72 hours] following a design basis accident. This analysis uses the as-built Control Room Envelope data as discussed in Section [xxx].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M24	**Preoperational Test** Battery Room Ventilation Flow Rate Verification Test (Hydrogen Control)	The [XXX system] maintains the hydrogen concentration levels in the battery rooms below one percent by volume.	A test will be performed of the [XXX system].	The airflow capability of the [XXX system] maintains the hydrogen concentration levels in the battery rooms below one percent by volume.
	Tier 2 Section 14.3 Discussion Section [9.4.x] provides a discussion of how the [XXX system] maintains the hydrogen concentration levels in the battery rooms below one percent by volume. In accordance with Section 14.2.x, a preoperational test demonstrates that the airflow capability of the [XXX system] maintains the hydrogen concentration levels in the battery rooms below one percent by volume.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M25	**As-built Inspection** Turbine Electrical Overspeed and Backup Overspeed Systems - Independence	The trip signals from the redundant turbine electrical overspeed protection trip systems are isolated from, and independent of, each other.	An inspection will be performed of the as-built redundant turbine electrical overspeed protection systems.	The redundant turbine electrical overspeed protection systems are supplied from different [circuit breakers and/or fuses] and do not share common equipment.
	Tier 2 Section 14.3 Discussion Section 10.2.x provides a description of the turbine generator system and its redundant independent turbine overspeed protection systems. An ITAAC inspection is performed of the redundant turbine electrical overspeed protection systems to verify that the trip circuitry for the [XXX system] and the [YYY system] are supplied from different [circuit breakers and/or fuses] and that the redundant turbine electrical overspeed protection systems do not share common equipment.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M26	**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 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: 1. 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 forgings. 2. Redundant design features are provided to stop and hold the load following specified component failures (wire rope, drive train, and control system) and operator errors (i.e., two-blocking and overload). This ITAAC inspection may be performed any time after manufacture of the [ZZZ crane] (at the factory or later).			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M27	**<u>Preoperational Test</u>** Crane Load Test	The [ZZZ crane] is capable of lifting and supporting its rated load, holding the rated load, and transporting the rated load.	A Rated Load Test will be performed of the [ZZZ crane].	The crane lifts, supports, holds with the brakes, and transports a load of 125 to 130 percent of the manufacturer's rated capacity, in accordance with the Rated Load Test requirements.
	<u>Tier 2 Section 14.3 Discussion</u> Section [9.1.4.x or 9.1.5.x] describes that the [ZZZ crane] can be 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. [In accordance with ASME NOG-1 paragraph 7422, the [ZZZ crane] is full load tested at a maximum of 100% of the hoist manufacturer's rating. After the full load test is completed, and prior to use of the crane to handle loads, the [ZZZ crane] is rated load tested at 125% (+5%, −0%) of the manufacturer's rating in accordance with ASME NOG-1 paragraph 7423.] In accordance with Section 14.2.x, a preoperational test demonstrates that each single failure proof [ZZZ crane] is rated load tested at 125% (+5%, −0%) of the manufacturer's rating.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M28	**<u>As-built Inspection</u>** Crane NDE	Single failure proof [ZZZ crane] welds are inspected.	An inspection will be performed of the as-built [ZZZ crane] welds using non-destructive examination in accordance with [ASME NOG-1 Code, or equivalent].	The results of the non-destructive examination of the [ZZZ crane] welds comply with [ASME NOG-1 Code, or equivalent].
	<u>Tier 2 Section 14.3 Discussion</u> Section [9.1.4.x or 9.1.5.x] discusses that the single failure proof [ZZZ crane] can be 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 to verify that the ASME Type I as-built [ZZZ crane] welds are nondestructively examined in accordance with the standards of ASME NOG-1 paragraph 4251.4 and or the [ZZZ crane] purchase specification. This ITAAC inspection may be performed any time after manufacture of the single failure proof [ZZZ crane] (at the factory or later).			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M29	**Design Analysis** New Fuel Storage Racks Criticality Analysis	The new fuel storage racks maintain an effective neutron multiplication factor (k-effective) to assure sub-criticality during plant life.	An analysis will be performed of the effective neutron multiplication factor (k-effective) for the as-built new fuel storage racks.	The new fuel storage racks maintain the effective neutron multiplication factor (k-effective) listed below at a 95 percent probability, 95 percent confidence level when loaded with fuel of the maximum fuel assembly reactivity during normal operations, during and after design basis seismic events, and during and after design basis dropped fuel assembly accidents: 1. k-effective must not exceed 0.95 if flooded with unborated water, and 2. k-effective must not exceed 0.98 if flooded with low-density hydrogenous fluid.
	Tier 2 Section 14.3 Discussion Sections 9.1.1 and 9.1.2 discuss the criticality analysis of the new fuel storage racks. An ITAAC analysis of the as-built new fuel storage racks is performed to demonstrate that the new fuel storage racks maintain the effective neutron multiplication factor (k-effective) listed below at a 95 percent probability, 95 percent confidence level when loaded with fuel of the maximum fuel assembly reactivity during normal operations, during and after design basis seismic events, and during and after design basis dropped fuel assembly accidents: 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. This ITAAC analysis may be performed any time after manufacture of the new fuel storage racks.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M30	**Design Analysis** Spent Fuel Storage [Racks] Criticality Analysis	The spent fuel storage [racks] maintain an effective neutron multiplication factor (k-effective) to assure sub-criticality during plant life.	An analysis will be performed of the effective neutron multiplication factor (k-effective) for the as-built spent fuel storage [racks].	The spent fuel storage racks maintain the effective neutron multiplication factor (k-effective) listed below at a 95 percent probability, 95 percent confidence level when loaded with fuel of the maximum fuel assembly reactivity during normal operations, during and after design basis seismic events, and during and after design basis dropped fuel assembly accidents: 1. If no credit is taken for soluble boron then k-effective must not exceed 0.95 if flooded with unborated water, or 2. If credit is taken for soluble boron then k-effective must not exceed 0.95 if flooded with borated water, and k-effective must remain below 1.0 (subcritical) if flooded with unborated water.
	Tier 2 Section 14.3 Discussion Sections 9.1.1 and 9.1.2 discuss the criticality analysis of the spent fuel storage racks. An ITAAC analysis of the as-built spent fuel storage racks is performed to demonstrate that the spent fuel storage [racks] maintain the effective neutron multiplication factor (k-effective) listed below at a 95 percent probability, 95 percent confidence level when loaded with fuel of the maximum fuel assembly reactivity during normal operations, during and after design basis seismic events, and during and after design basis dropped fuel assembly accidents. If no credit is taken for soluble boron then k-effective must not exceed 0.95 if flooded with unborated water. OR If credit is taken for soluble boron: k-effective must not exceed 0.95 if flooded with borated water, and k-effective must remain below 1.0 (subcritical) if flooded with unborated water.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M31	**<u>Preoperational Testing and Analysis</u>** RCS Pressure Boundary Leakage Detection Test – Sump Level Sensors	[Reactor Containment Building] sump level sensors support Reactor Coolant System Pressure Boundary leakage detection.	A test and analysis 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.
	<u>Tier 2 Section 14.3 Discussion</u> 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, Revision 1 regarding detection, monitoring, quantifying, and identification of reactor coolant leakage. In accordance with Section 14.2.x, a preoperational test demonstrates that 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. The analysis of the correlation will consider the level increase per unit volume added to the sump.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M32	**<u>Preoperational Testing and Analysis</u>** RCS Pressure Boundary Leakage Detection Test – Radiation Monitors	The [Reactor Containment Building] radiation monitors support Reactor Coolant System Pressure Boundary leakage detection.	A test and analysis 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.
	<u>Tier 2 Section 14.3 Discussion</u> 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 [Reactor Containment Building] radiation monitors detect a radiation level 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 line losses, sampling delays, and background radiation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M33	**<u>Preoperational Testing</u>** RCS Pressure Boundary Leakage Detection Test– Alternative Method {This ITAAC is only necessary if one or both of M31 and M32 for RCPB detection are not applicable to the design. RG 1.45 specifies that two RCPB detection methods are necessary.}	The [XXX system] supports Reactor Coolant System Pressure Boundary leakage detection.	A test and analysis will be performed of the [XXX system].	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.
	<u>Tier 2 Section 14.3 Discussion</u> 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 line losses, sampling delays, and background radiation.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M34	**<u>System Functional Arrangement</u>** Verification of functional arrangement of Components, Piping, and Supports in [XXX system]	The functional arrangement of [XXX system] is consistent with design specifications.	Inspection of the as-built [XXX system] will be performed to verify that [components, piping, and supports] are functionally arranged consistent with design specifications.	The as-built [XXX system] functional arrangement is consistent with design specifications.
	Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system and its components are physically arranged to provide the service for which the system is intended, consistent with design specifications (including references in the specifications to manufacturers' recommendations). The design specifications are those prepared in support of the specific application as required by 10 CFR 52.47 for design certifications, or 10 CFR 52.73(b) for COL applications.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M35	**<u>As-Built Inspection and Analysis</u>** Physical separation of divisions.	Each [XXX system] division is physically separated from the other divisions to preclude the loss of the [safety-related or RTNSS] 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 practical extent] to preclude the loss of the [safety-related or RTNSS] function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.
	<u>Tier 2 Section 14.3 Discussion</u> [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 or RTNSS] function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
M36	**<u>Preoperational Test</u>** Main Turbine Isolation Trip Test.	The main turbine isolation valves close in response to a turbine trip signal.	A test will be performed of the as-built main turbine isolation valves.	The main turbine isolation valves listed in [Table x.x.x-x] close on a turbine trip signal.
	<u>Tier 2 Section 14.3 Discussion</u> [Section xx] discusses the main turbine and the associated turbine trip signals. In accordance with Section 14.2.x, a preoperational test will be performed to verify the main turbine is isolated upon actuation of turbine trip signal.			

Cxx - Containment ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C01	**As-Built Inspection** Containment Combustible Gas Control – Location	The [XXX system] controls the combustible gas concentration in the [primary reactor containment].	An inspection will be performed of the as-built [XXX system] [hydrogen igniters and/or passive autocatalytic recombiners].	The [XXX system] [hydrogen igniters and/or passive autocatalytic recombiners] are located as identified in [Table x.x.x-x or Figure x.x.x-x].
	Tier 2 Section 14.3 Discussion Section 6.2.x provides a discussion of how the [XXX system] limits the buildup and concentration of combustible gases in the [primary reactor containment] to prevent combustible mixtures from occurring. An ITAAC inspection is performed to verify that the [XXX system] [hydrogen igniters and/or passive autocatalytic recombiners] are located in their required locations within primary reactor containment.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C02	**Deleted**			
	Tier 2 Section 14.3 Discussion **Deleted**			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C03	<u>**Preoperational Test**</u> Containment Combustible Gas Control Test - 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 each [XXX system] hydrogen igniter.	The surface temperature of each hydrogen igniter exceeds [###°F].
	Tier 2 Section 14.3 Discussion Section 6.2.x provides a discussion of how the [XXX system] limits the buildup and concentration of combustible gases in the [primary reactor containment] to prevent combustible mixtures from occurring. In accordance with Section 14.2.x, a preoperational test demonstrates that the surface temperature of each [XXX system] hydrogen igniter exceeds [###°F].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C04	**<u>Preoperational Test</u>** Containment Leak Rate Tests (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] per 10 CFR Part 50, Appendix J. ii. Leakage tests will be performed of the pressure containing or leakage-limiting boundaries, and containment isolation valves per 10 CFR Part 50, Appendix J.	i. The test results for the integrated leak rate test (Type A) meet 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.
	<u>Tier 2 Section 14.3 Discussion</u> 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. In accordance with Section 14.2.x, preoperational tests demonstrate 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.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C05	**Preoperational Test** Containment Isolation Valve Closure Time	Containment isolation valve (CIV) closure times are established to limit potential releases of radioactivity to amounts as low as is reasonably achievable.	A stroke time test of each CIV will be performed.	Each CIV listed in [Table x.x.x-x] travels from the full open to full closed position in less than or equal to the time identified in the table.
	Tier 2 Section 14.3 Discussion A preoperational test, described in Tier 2 Section 14.2.x, is performed to demonstrate that the containment isolation valve stroke times satisfy the valve closure requirements for containment isolation as described in Tier 2, Section 6.x.x.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
C06	**As-Built Inspection** Containment Isolation Valve - Location.	The length of piping shall be minimized between the containment penetration and the associated outboard containment isolation valve(s).	An inspection will be performed of the as-built piping between each containment penetration and its associated outboard containment isolation valve(s),	The length of piping between each containment penetration and its associated outboard containment isolation valve is less than or equal to the length identified in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion An ITAAC inspection is performed to verify the piping length between the containment penetration and isolation valves located outside of containment is minimized, as practical, in accordance with 10 CFR Part 50, Appendix A, GDC 55, 56 and 57.			

Rxx - Radiation Protection ITAAC and Tier 2 Section 14.3 Discussion of ITAAC Closure Determination

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R01	**As-Built Inspection** Radiation Shielding Barriers - Thickness	The [YYY structure] includes radiation shielding barriers for normal operation and post-accident radiation shielding.	An inspection will be performed of the as-built [YYY structure] radiation shielding barriers.	The thickness of [YYY structure] radiation shielding barriers is greater than or equal to the thickness specified [in Table x.x.x-x or shown on Figure x.x.x-x].
	Tier 2 Section 14.3 Discussion Section 12.2 and Section 12.3.x provides the design bases for radiation shielding, including type, form and material properties utilized in specific locations. Radiation shielding is provided to meet the radiation zone and access requirements for normal operation and post-accident conditions, and compliance with 10 CFR 50.49. Compartment walls, ceilings, and floors, or other barriers provide shielding. An ITAAC inspection is performed to verify that the thickness of [YYY structure] radiation barriers is greater than or equal to the required thicknesses specified in [Table x.x.x-x].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R02	**As-Built Inspection** Radiation Barriers – Radiation Attenuating Doors	The [YYY structure] includes radiation attenuating doors with a radiation attenuation capability that meets or exceeds that of the wall within which they are installed.	An inspection will be performed of the as-built [YYY structure] radiation attenuating doors.	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.
	Tier 2 Section 14.3 Discussion 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. Radiation attenuating doors must meet or exceed the radiation attenuation capability of the wall within which they are installed. An ITAAC inspection is performed to verify that the [YYY structure] radiation attenuating doors are installed in their design location and have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R03	**As-Built Inspection** Spent Fuel Pool Penetration Elevation	The spent fuel pool penetrations are located so that the spent fuel pool cannot be drained to a level below [### ft] above the top of stored fuel assemblies within the fuel racks.	An inspection will be performed of the as-built spent fuel pool.	There are no gates, openings, drains, or piping within the spent fuel pool that are below [### ft] above the top of stored fuel within the fuel racks as measured from the bottom of the spent fuel pool.
	Tier 2 Section 14.3 Discussion Section 9.1.x describes the spent fuel pool. No piping, openings, doors, or penetrations through the storage pool wall are installed below the minimum water level required for shielding. Gates, openings, or drains, permanently connected mechanical or hydraulic systems (piping), and other features that by maloperation or failure could reduce the coolant inventory to unsafe levels are not included in the design. An ITAAC inspection is performed to verify that the spent fuel pool includes no gates, openings, drains, or piping below [### ft] above the top of stored fuel as measured from the bottom of the spent fuel pool. This inspection is performed by physical measurements in the as-built spent fuel pool and includes the added elevation of the fuel assembly from the bottom of the pool due to the spent fuel rack.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R04	**As-Built Inspection and Reconciliation Analysis** [XXX system] [RW-XX] Equipment.	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.	An inspection and reconciliation analysis will be performed of the as-built [XXX system] non-Seismic Category I [RW-XX] equipment.	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.
	Tier 2 Section 14.3 Discussion [Section XX] provides a discussion of the [XXX system], which is non-Seismic Category I [RW-XX] designed and constructed to the standards of RG 1.143 to withstand the design loads without loss of structural integrity. 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.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R05	**<u>Preoperational Test</u>** Fuel Handling Equipment Lift Height Interlock Test	The [Refueling Machine] and [Spent Fuel Machine] [gripper masts'] travel is limited such that the operator dose rate is no greater than 2.5 mrem/hr when an irradiated fuel unit, control component, or both is elevated to the up position interlock with the pool at the lower limit of the normal operating water level.	i. A test will be performed of the [Refueling Machine gripper mast] limit switch. ii. A test will be performed of the [Spent Fuel Machine gripper mast] limit switch.	i. The [Refueling Machine gripper mast] limit switch prevents lifting the top of the irradiated fuel unit or control component above [### ft] as measured from the bottom of the [refueling canal]. ii. The [Spent Fuel Machine gripper mast] limit switch prevents lifting the top of the irradiated fuel unit or control component above [### ft] as measured from the bottom of the [spent fuel pool].
	<u>Tier 2 Section 14.3 Discussion</u> Section 9.1.4.x and Section 12.3 provide descriptions of how the limit switches on the [Refueling Machine and Spent Fuel Machine] [gripper masts] limit travel such that the dose rate is less than 2.5 mrem/hr when an irradiated fuel unit, control component, or both is elevated to the up position interlock setting with the pool at the normal operating water level. In accordance with Section 14.2.x, a preoperational test demonstrates that the [Refueling Machine gripper mast] limit switch prevents lifting the top of the irradiated fuel unit or control component above [### ft] as measured from the bottom of the [refueling canal]. In accordance with Section 14.2.x, a preoperational test demonstrates that the [Spent Fuel Machine gripper mast] limit switch prevents lifting the top of the irradiated fuel unit or control component above [### ft] as measured from the bottom of the [spent fuel pool].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R06	**<u>Preoperational Test</u>** [YYY Structure] Differential Pressure Test	The [XXX system] maintains a [positive, negative] pressure in the [YYY structure/room] relative to the outside environment and adjacent areas.	A test will be performed of the [XXX system] while operating in a normal operating and design basis accident alignment.	The [XXX system] maintains a [positive, negative] pressure of [greater than, less than or equal to ### inches water gauge] in the [YYY structure/room] relative to the outside environment and adjacent areas, while operating in a normal operating and design basis accident alignment.
	<u>Tier 2 Section 14.3 Discussion</u> [Section 9 and Section 12.3 discusses the operation of the [XXX system] which maintains a [positive, negative] pressure in the [YYY room] relative to the outside environment and adjacent areas. This is consistent with the requirements of 10 CFR Part 20, Subparts E and H and 10 CFR Part 50, Appendix I. In accordance with Section 14.2.x, a preoperational test demonstrates the [XXX system] will maintain a [positive, negative] pressure of [greater than, less than or equal to ### inches water gauge] in the [YYY room] relative to the outside environment and adjacent areas, while operating in a design basis accident alignment. In accordance with Section 14.2.x, a preoperational test demonstrates the [XXX system] will maintain a [positive, negative] pressure of [greater than, less than or equal to ### inches water gauge] in the [YYY room] relative to the outside environment and adjacent areas, while operating in a normal operating alignment.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R07	**Preoperational Test** [XXX system] High Radioactivity Automatic System Isolation/Alignment Test	[XXX system] radiation monitor(s) respond to mitigate a release on detection of high radioactivity.	A test, using a test source, will be performed of the [XXX system] radiation monitor(s).	The radiation monitors listed in [Table x.x.x-x], on detection of a high radioactivity level exceeding the trip set point for the test, [isolate the [XXX system] by closing the [valve XXX] or align the [XXX system] to the [YYY system] HEPA filter train].
	Tier 2 Section 14.3 Discussion [Section x.x] discusses the operation of the [XXX system]. Upon receipt of a high radioactivity signal from radiation monitor [XXX], using a radioactive source, the [XXX system] automatically [aligns to a HEPA train or isolates flow by realignment of valves/dampers]. In accordance with Section 14.2.x, a preoperational test demonstrates that upon receipt of a high radioactivity signal from radiation monitor [ZZZ], the [XXX system] automatically [aligns to a HEPA train or isolates flow by realignment of valves/dampers].			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R08	**Design Analysis** Primary to Secondary Leakage Detection *{PWR Plants Only}*	The [XXX system] monitors primary to secondary leakage to provide early indication of a potential steam generator tube leak.	An analysis will be performed to verify the as-built primary to secondary leakage detection system will detect a primary to secondary leak rate of [### gallons per day].	The primary to secondary leakage detection system will detect a minimum primary to secondary leak rate of [### gallons per day].
	Tier 2 Section 14.3 Discussion [Section XX] discusses the primary to secondary leakage detection 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 detection instrument background conditions, that the leakage detection criteria outlined in EPRI “PWR Primary-to-Secondary Leak Guidelines”, are met for the credited monitoring system to provide for rapid detection and response to indicated steam generator tube leakage.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R09	**As-Built Inspection and Analysis** 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 [xx%] of the containment atmosphere free volume to permit assessment of containment conditions following a design basis LOCA.	An inspection and analysis will be performed of the as-built Containment High Range Radiation Monitors.	The location of the high range radiation monitors will provide independent measurements such that 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.
	Tier 2 Section 14.3 Discussion Section 12.3 describes the high range containment area radiation monitors. An analysis should demonstrate that the radiation monitors are capable of assessing post LOCA containment radiation conditions through wide separation, providing independent measurements, which "view" a large fraction of the containment volume. Monitors should not be placed in areas, which are protected by massive shielding and should be reasonably accessible for replacement, maintenance, or calibration.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R10	**As-built Inspection** Radiation Shielding Integrity Assurance	The [YYY structure] includes provisions for the assuring the integrity of radiation shielding barriers provided for normal operation and post-accident radiation shielding.	An inspection will be performed of the as-built [YYY structure] features provided for assuring the integrity of radiation protection shielding.	The features in the [YYY structure] for assuring the integrity of radiation barriers, are as described in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion Section 12.2 and Section 12.3.x provide the design bases for radiation shielding, including type, form and material properties utilized in specific locations. Where the assurance of continued integrity of radiation barriers is dependent on other design features (e.g., cooling air flow to prevent degradation of polymer shielding materials), an ITAAC inspection is performed to verify that the features described in [Table x.x.x-x] have been provided.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R11	**As-built Inspection** Radiation Barriers - Radiation Attenuating Doors	The [YYY structure] radiation attenuating door(s) for very high radiation areas include locking features to prevent unauthorized access and allow unfettered egress.	An inspection will be performed of the as-built [YYY structure] radiation attenuating door(s) for very high radiation areas.	The [YYY structure] radiation attenuating door(s) for very high radiation areas include locking features to prevent unauthorized access and allow unfettered egress.
	Tier 2 Section 14.3 Discussion Section 12.2 and Section 12.3.x provide 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. Radiation attenuating door(s) must meet the access restriction and egress capability required by 10 CFR Part 20 Subpart G. An ITAAC inspection is performed to verify the access and egress provisions function of the [YYY structure] radiation attenuating door(s).			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">R12</td><td><u>System Functional Arrangement</u>
Verification of Functional Arrangement of Components in the Liquid Waste Management System</td><td>The functional arrangement of [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.</td><td>Inspection of the as-built [XXX system] will be performed to verify that components, piping, supports and instrumentation are functionally arranged as described in the Design Description of this Subsection and its Figures, and consistent with design specifications.</td><td>The functional arrangement of the [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications and manufacturer recommendations.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system is physically arranged to provide the service for which the system is intended as depicted in the Tier 1 Design Description and its Figures, including equipment and instrument locations, and consistent with design specifications (including references in the specifications to manufacturer recommendations). For example, the as-built inspection will verify that (1) valves with shutoff functions are properly installed and without bypass flow paths; (2) orientation of gate, globe and butterfly valves are appropriate (e.g., gate valve disk is upright, globe valve disk for flow under or over seat is in accordance with performance requirements, and butterfly valve disk is oriented in self-opening or self-closing direction per system design provisions); (3) check valve disk or nozzle is oriented in accordance with system design provisions; (4) process control instrumentation is installed in the appropriate locations and configurations (5) no installation damage to components, piping, and cabling is identified; (6) no integrity concerns for components are found; (7) pumps and valves are installed per manufacturer specifications; (8) proper connection of cables is observed without pinching, stress, or excessive bend radius; (9) pipe supports and snubbers are in good condition and properly installed to perform their intended function; (10) no fluid leakage is observed from components; (11) piping configuration precludes unintended loop seals and high point vapor traps; (12) the correct type and quantity of process control media are installed; and (13) where necessary, combustion/explosion controls are installed.</td></tr>
</table>

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R13	**System Functional Arrangement** Verification of Functional Arrangement of Components in the Gaseous Waste Management System	The functional arrangement of [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.	Inspection of the as-built [XXX system] will be performed to verify that components, piping, supports and instrumentation are functionally arranged as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.	The functional arrangement of the [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.
	Tier 2 Section 14.3 Discussion Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system is physically arranged to provide the service for which the system is intended as depicted in the Tier 1 Design Description and its Figures, including equipment and instrument locations, and consistent with design specifications (including references in the specifications to manufacturer recommendations). For example, the as-built inspection will verify that (1) valves with shutoff functions are properly installed and without bypass flow paths; (2) orientation of gate, globe and butterfly valves are appropriate (e.g., gate valve disk is upright, globe valve disk for flow under or over seat is in accordance with performance requirements, and butterfly valve disk is oriented in self-opening or self-closing direction per system design provisions); (3) check valve disk or nozzle is oriented in accordance with system design provisions; (4) process control instrumentation is installed in the appropriate locations and configurations (5) no installation damage to components, piping, and cabling is identified; (6) no integrity concerns for components are found; (7) pumps and valves are installed per manufacturer specifications; (8) proper connection of cables is observed without pinching, stress, or excessive bend radius; (9) pipe supports and snubbers are in good condition and properly installed to perform their intended function; (10) no fluid leakage is observed from components; (11) piping configuration precludes unintended loop seals and high point vapor traps; (12) the correct type and quantity of process control media are installed; and (13) where necessary, combustion/explosion controls are installed.			

<table>
<tr><th>No.</th><th>ITAAC Category/Type</th><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr><td rowspan="2">R14</td><td><u>System Functional Arrangement</u>
Verification of Functional arrangement of Components in the Solid Waste Management System</td><td>The functional arrangement of [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.</td><td>Inspection of the as-built [XXX system] will be performed to verify that components, piping, supports and instrumentation are functionally arranged as described in the Design Description of this Subsection and its Figures, and consistent with design specifications.</td><td>The functional arrangement of the [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.</td></tr>
<tr><td colspan="4"><u>Tier 2 Section 14.3 Discussion</u>
Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system is physically arranged to provide the service for which the system is intended as depicted in the Tier 1 Design Description and its Figures, including equipment and instrument locations, and consistent with design specifications (including references in the specifications to manufacturer recommendations). For example, the as-built inspection will verify that (1) valves with shutoff functions are properly installed and without bypass flow paths; (2) orientation of gate, globe and butterfly valves are appropriate (e.g., gate valve disk is upright, globe valve disk for flow under or over seat is in accordance with performance requirements, and butterfly valve disk is oriented in self-opening or self-closing direction per system design provisions); (3) check valve disk or nozzle is oriented in accordance with system design provisions; (4) process control instrumentation is installed in the appropriate locations and configurations (5) no installation damage to components, piping, and cabling is identified; (6) no integrity concerns for components are found; (7) pumps and valves are installed per manufacturer specifications; (8) proper connection of cables is observed without pinching, stress, or excessive bend radius; (9) pipe supports and snubbers are in good condition and properly installed to perform their intended function; (10) no fluid leakage is observed from components; (11) piping configuration precludes unintended loop seals and high point vapor traps; (12) the correct type and quantity of process control media are installed; and (13) where necessary, combustion/explosion controls are installed.</td></tr>
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No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R15	**System Functional Arrangement** Verification of Functional arrangement of Components in the Effluent Monitoring System	The functional arrangement of [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications .	Inspection of the as-built [XXX system] will be performed to verify that components, piping, supports and instrumentation are functionally arranged as described in the Design Description of this Subsection and its Figures, and consistent with design specifications.	The functional arrangement of the [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.
	Tier 2 Section 14.3 Discussion Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system is physically arranged to provide the service for which the system is intended as depicted in the Tier 1 Design Description and its Figures, including equipment and instrument locations, and consistent with design specifications (including references in the specifications to manufacturer recommendations). For example, the as-built inspection will verify that (1) valves with shutoff functions are properly installed and without bypass flow paths; (2) orientation of gate, globe and butterfly valves are appropriate (e.g., gate valve disk is upright, globe valve disk for flow under or over seat is in accordance with performance requirements, and butterfly valve disk is oriented in self-opening or self-closing direction per system design provisions); (3) check valve disk or nozzle is oriented in accordance with system design provisions; (4) process control instrumentation is installed in the appropriate locations and configurations (5) no installation damage to components, piping, and cabling is identified; (6) no integrity concerns for components are found; (7) pumps and valves are installed per manufacturer specifications; (8) proper connection of cables is observed without pinching, stress, or excessive bend radius; (9) pipe supports and snubbers are in good condition and properly installed to perform their intended function; (10) no fluid leakage is observed from components; (11) piping configuration precludes unintended loop seals and high point vapor traps; (12) the correct type and quantity of process control media are installed; (13) where necessary, combustion/explosion controls are installed; (14) where necessary, methods to prevent condensation (e.g., heat tracing) are installed and functional; and (15) flow rate measurement instruments are installed using the appropriate elements, in the appropriate configuration.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R16	**System Functional Arrangement** Verification of Functional arrangement of Radiation Monitoring Equipment System	The functional arrangement of [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.	Inspection of the as-built [XXX system] will be performed to verify that components, piping, supports and instrumentation are installed as described in the Design Description of this Subsection and its Figures, and consistent with design specifications.	The functional arrangement of the [XXX system] is as described in the Design Description of this Subsection and its Figures, and is consistent with design specifications.
	Tier 2 Section 14.3 Discussion Verification of the Functional Arrangement of a system, as used in this ITAAC, means verifying that the system is physically arranged to provide the service for which the system is intended as depicted in the Tier 1 Design Description and its Figures, including equipment and instrument locations, and consistent with design specifications (including references in the specifications to manufacturer recommendations). For instance, radiation monitoring equipment, identified in Chapter 11 and Chapter 12 to meet the requirements of 10 CFR Part 20 Subpart F, 10 CFR 50.68(b)(6), 10 CFR 50 Appendix E(VI) or 10 CFR 70.24, are installed.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R17	**Preoperational Test** Engineered Safety Features (ESF) Heating, Ventilation, and Air Conditioning (HVAC) Duct Leakage Test	The [XXX] ESF System HVAC ducts are tested for leakage.	The [XXX] ESF System HVAC ducts will be tested for leakage.	The leakage of the [XXX] ESF System HVAC ducts is less than [ZZZ].
	Tier 2 Section 14.3 Discussion Consistent with the guidance of RG 1.52, the ducting of ESF HVAC described in Chapters 6, 9, 12., and 15, should be tested to assure that the total leakage rate from ducting is less than the values assumed in the post-accident dose consequence design bases.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R18	**As-built Inspection** Tank Failure Leakage Prevention	The [YYY structure] includes provisions for preventing the leakage of radioactive material.	An inspection will be performed of the as-built [YYY structure] features for preventing the leakage of radioactive material.	The features in the [YYY structure] for preventing the leakage of radioactive material are as described in [Table x.x.x-x].
	Tier 2 Section 14.3 Discussion Sections 11.4, BTP-11-3 and Section 2, describe the potential use of stainless steel liners, or other methods of containing radioactive material that were determined to be acceptable to the staff for tank failure analysis. An ITAAC inspection will confirm that these design features are installed in accordance with the design commitments.			

No.	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
R19	**As-built Inspection** Minimizing Contamination	Design features exist to minimize, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize the generation of radioactive waste, as identified in [Table x.x.x-x].	Inspections will be performed of the design features identified in [Table x.x.x-x].	The design features identified in [Table x.x.x-x] are present.
	Tier 2 Section 14.3 Discussion Section 12.3 describes the design features provided to minimize contamination of the facility and the environment, facilitate eventual decommissioning, and minimize the generation of radioactive waste, consistent with the requirements of 10 CFR 20.1406, and the guidance of Bulletin 80-10 and RG 4.21. [Table x.x.x-x] identifies the subset of design features provided to address leaks from high specific activity fluids (such as Reactor Coolant System water, Spent Fuel Pool coolant or concentrated liquid waste) or from high volume, low specific activity fluids (such as diluted liquid radioactive waste).			