

Response to

Request for Additional Information No. 78(958), Revision 0

10/3/2008

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

**SRP Section: 14.03.05 - Instrumentation and Controls - Inspections, Tests,
Analyses, and Acceptance Criteria**

Application Section: 14.3

ICE1 Branch

Question 14.03.05-1:

Describe how each of the inspections, tests, analyses and acceptance criteria (ITAAC) listed in FSAR Tier 1 Section 2 for interlock systems important to safety adequately address the requirements for such systems in order to provide reasonable assurance that a proposed facility would be constructed and operated in conformity to the design certification.

10 CFR 52.47(b)(1) requires, in part, that the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the ITAAC are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity to the design certification. FSAR Tier 1 Section 2, Tables 2.2.3-3, 2.2.6-3, 2.4.1-9, 2.4.2-2, 2.4.4-5, 2.4.5-2 and 2.4.10-1 ITAAC identifies ITAAC for interlock systems important to safety. For interlock systems described in FSAR Section 7.6, identify ITAAC that addresses these interlocks or provide basis for not having ITAAC.

Response to Question 14.03.05-1:

The following interlocks are described in U.S. EPR FSAR Tier 2, Section 7.6:

- Residual heat removal (RHR) suction valves interlock.
- Medium head safety injection (MHSI) large miniflow line valves interlock.
- Safety injection accumulator valves interlock.
- Isolation of component cooling water system (CCWS) trains.

The interlock on the RHR suction valves is addressed in U.S. EPR FSAR Tier 2, Section 7.6.1.2.1 under the heading "RHR Suction Valve Interlocks." The interlock on the MHSI large miniflow valves is addressed in U.S. EPR FSAR Tier 2, Section 7.6.1.2.4 under the heading "Interlocks to Provide Low Temperature Over-Pressure Protection." The interlock on the safety injection accumulator valves is addressed in U.S. EPR FSAR Tier 2, Section 7.6.1.2.2, under the heading "Safety Injection Accumulator Interlocks." The interlock on the isolation of CCWS trains is addressed in U.S. EPR FSAR Tier 2, Section 7.6.1.2.3, under the heading "Interlocks Isolating Redundant CCWS Trains."

The first three bulleted interlocks listed above are provided in U.S. EPR FSAR Tier 1, Table 2.4.1-8. The ITAAC that addresses these interlocks is provided in U.S. EPR FSAR Tier 1, Table 2.4.1-9, item 4.13. The last bulleted interlock listed above is provided in U.S. EPR FSAR Tier 1, Table 2.4.4-4. The ITAAC that addresses this interlock is provided in U.S. EPR FSAR Tier 1, Table 2.4.4-5, item 4.4.

U.S. EPR FSAR Tier 1 does not provide details on how an interlock operates. U.S. EPR FSAR Tier 1 provides top level information that is extracted from the more detailed Tier 2 design information. The detailed explanation on how the interlocks operate is addressed in U.S. EPR FSAR Tier 2, Section 7.6.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 14.03.05-2:

Provide additional detail on how each of the software development life cycle phases listed in Tier 1, Tables 2.4.1-9, 2.4.2-2, 2.4.4-5, and 2.4.9-3 map to the life cycle phases in Standard Review Plan, Branch Technical Position (BTP) 7-14.

The ITAAC does not seem to fully address all aspects of a high quality software design process as described in BTP 7-14. For example, Table 2.4.1-9, "Protection System ITAAC," Commitment 4.14, is at a high level and it's not clear where/how ITAAC addresses specific planning documentation as well as each of the management, implementation, and resource characteristics shown in BTP 7-14. Provide additional detail to demonstrate how ITAAC fully addresses each of the life cycle phases for hardware and software development.

Response to Question 14.03.05-2:

Conformance of U.S. EPR software life cycle processes with BTP 7-14 is addressed in ANP-10272 "Software Program Manual TELEPERM XS Safety Systems." The software life cycle phases presented in U.S. EPR FSAR Tier 1, Section 2.4.1, Section 2.4.2, Section 2.4.4, and Section 2.4.9 are the same phases presented in ANP-10272. U.S. EPR FSAR Tier 2, Section 7.1.1.2.2 states that the Software Program Manual (SPM) describes the software life cycle processes for application software development used in safety-related applications. The SPM describes the program measures incorporated by AREVA NP to conform to established technical and documentation requirements, conventions, rules, and industry standards.

U.S. EPR FSAR Tier 1 presents the safety significant design features of the U.S. EPR and provides ITAAC associated with those design features. U.S. EPR FSAR Tier 1 is not intended to provide a detailed explanation on how the ITAAC meets individual requirements. Details of conformance of design features (including processes such as the software life cycle) are provided in U.S. EPR FSAR Tier 2. In the case of the software life cycle, such details are incorporated in Tier 2 by reference to ANP-10272.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 14.03.05-3:

Demonstrate how ITAAC addresses the digital safety system security guidance provided in Rev. 2 of Regulatory Guide (RG) 1.152, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants."

ITAAC should verify that the application conforms with Regulatory Positions 2.1-2.9 in RG 1.152. How is ITAAC addressing security as described in above RG and cyber security in general?

Response to Question 14.03.05-3:

A response to this question will be provided by March 27, 2009.

Question 14.03.05-4:

Identify which Inspection, Tests, Analysis, and Acceptance Criteria (ITAAC) address the following aspects of safety systems identified in Tier 1, Section 2.4 and describe how the ITAAC address these aspects:

1. Environmental Qualification of equipment (temperature, humidity, etc.)
2. Not only the existence, but proper operation of equipment used to transfer control from the main control room to the remote shutdown station.
3. Not only the existence, but proper operation of permissive and bypass functions, including automatic removal of bypasses
4. Physical and cyber access controls are present and functional
5. Proper identification of instrumentation and control (I&C) components

10 CFR 52.47(b)(1) requires, in part, that ITAAC are necessary and sufficient to provide reasonable assurance that if the ITAAC are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Act, and the Commission's rules and regulations. One of the regulations affecting safety-related I&C systems is 10 CFR 50.55a(h), which endorses IEEE Std. 603-1991. IEEE Std. 603 provides criteria for safety systems, including equipment qualification, manual control, operating bypasses, and identification of equipment. The staff could not identify ITAAC that addressed the above mentioned aspects of IEEE Std. 603 criteria. For example, the staff identified ITAAC addressing seismic and electromagnetic interference qualification of equipment, but not environmental aspects such as temperature. Also, some ITAAC addressed the existence of equipment and features, but not their proper operation. Completion of the ITAAC should provide assurance that the criteria in 10 CFR 50.55a(h) are met for the installed instrumentation and control system.

Response to Question 14.03.05-4:

A response to this question will be provided by March 27, 2009.

Question 14.03.05-5:

Provide clarification regarding specific wording as it relates to style of ITAAC column 1 and 2.

Although the applicant is not totally restricted with the wording to be used for Columns 1 and 2, it's important that ITAAC is consistent with DC-FSAR Section 14.3 and to have wording that comes as close as possible to the design information in the COL application.

Specifically, FSAR Section 14.3.2.3 indicates that Column 1 is Titled "Design Commitment" and Column 2 "Inspections, Tests, and Analyses." However, Section 2.4 ITAAC has slightly different wording for both Column 1 and 2. Provide the exact correct wording to be used for ITAAC Columns 1 and 2.

Response to Question 14.03.05-5:

Wording used in U.S. EPR FSAR Tier 1 for ITAAC columns is "commitment wording" for column 1, "inspection, test, or analysis" for column 2, and "acceptance criteria" for column 3. U.S. EPR FSAR Tier 2, Section 14.3.2.3 will be revised to match the wording used in U.S. EPR FSAR Tier 1.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 14.3.2.3 will be revised as described in the response and indicated on the enclosed markup.

Question 14.03.05-6:

Provide clarification on why DC-FSAR Section 14.3, Table 14.3-8, "ITAAC Screening Summary Sheet," seems to be inconsistent with FSAR Tier 1, Section 2.4.

Sheet 6 of 7 from Table 14.3-8 indicates that Tier 1 for Communication System has no ITAAC but when staff reviewed Tier 1 Section 2.4.21 it did have ITAAC. Also, on the same Sheet 6 of 7, the table indicates that Tier 1 for the Leak Detection System has ITAAC but when staff reviewed Tier 1, Section 2.4.8, it had no ITAAC. The last two sheets of Table 14.3-8 also list ITAAC for Main Control Room, Remote Shutdown Station, and Technical Support Center but none are discussed in Tier 1 Section 2.4.

Provide clarification on the ITAAC screening process and confirm which I&C systems will have ITAAC.

Response to Question 14.03.05-6:

U.S. EPR FSAR Tier 2, Table 14.3-8 was revised to be consistent with U.S. EPR FSAR Tier 1:

- Titles of structures, systems, or components listed in U.S. EPR FSAR Tier 2, Table 14.3-8 were revised to match U.S. EPR FSAR Tier 1.
- The column titled "Within Scope of Tier 1" in U.S. EPR FSAR Tier 2, Table 14.3-8 was revised to match those systems listed in U.S. EPR FSAR Tier 1.
- The column titled "Has ITAAC in Tier 1" in U.S. EPR FSAR Tier 2, Table 14.3-8 was revised to match those systems having ITAAC in U.S. EPR FSAR Tier 1.
- An additional column titled "Tier 1 Section," was added to U.S. EPR FSAR Tier 2, Table 14.3-8 to provide clarification where systems are addressed in U.S. EPR FSAR Tier 1. For example, although the main control room, remote shutdown station, and Technical Support Center are instrumentation and control (I&C) systems, ITAAC for these systems are located in U.S. EPR FSAR Tier 1, Section 3.4 for human factor engineering.

The description of the leakage detection system in U.S. EPR FSAR Tier 1, Section 2.4.8 was deleted and replaced with the statement "There are no Tier 1 entries for this system." Since there are no ITAAC for this system, a system description is not necessary.

U.S. EPR FSAR Tier 1, Section 2.8.4 was deleted because the U.S. EPR does not have a system titled "sealing steam system." For the U.S. EPR, sealing steam is addressed in U.S. EPR FSAR Tier 1, Section 2.8.3, "Turbine Sealing Steam."

The ITAAC screening process is described in U.S. EPR FSAR Tier 2, Section 14.3.2 and involves two processes, described as follows.

The first process uses discipline checklists that include ITAAC criteria based on guidance in Standard Review Plan (SRP), Section 14.3. For example, the discipline checklist for I&C systems provides guidance to create ITAAC for the following features:

- Major safety-related features.
- Equipment that is seismic, EQ, or 1E.

- Safety-related equipment.
- Design features provided for severe accident mitigation, station blackout, and anticipated transient without scram.
- Significant system features identified in the applicable SRPs for the system.
- Significant safety-related (and non-safety-related) functions derived from those listed in system design requirements documents.

The second process involves an expert review panel that selects safety significant features based on assumptions and insights from key safety and integrated plant safety analyses in Tier 2, where plant performance is dependent on contributions from multiple systems. This process is based on guidance in SRP 14.3, page 14.3-21. Results of the expert review panel meetings are provided in U.S. EPR FSAR Tier 2, Tables 14.3-1 through 14.3-7.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 14.3-8 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 1, Section 2.4.8 and Section 2.8.4 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

- ITAAC are only intended to verify the as-built configuration of important design features and performance characteristics described in the design descriptions. Therefore, there are no ITAAC for features not addressed in the design description.
- Each U.S. EPR system that has a design description also has associated ITAAC. The scope of the ITAAC corresponds to the scope of the design descriptions.
- A single inspection, test, or analysis may verify multiple provisions in the certified design description.
- The inspections, tests, and analyses must be completed and the acceptance criteria verified prior to the initial loading of fuel (10 CFR 52.103).

14.3.2.3 Content of ITAAC

ITAAC tables for the U.S. EPR use the standard format in Appendix D of SRP 14.3. The ITAAC tables have columns for commitment wording: inspection, test, or analysis; and acceptance criteria~~design commitments; inspections, tests, and analyses; and acceptance criteria~~. Each ~~design~~ commitment in the left-hand column has an associated inspection, test, or analysis requirement in the middle column with the applicable acceptance criteria listed in the right-hand column.

Column 1 (~~Design~~-Commitment Wording) defines the specific commitment extracted from the SDD features.

Column 2 (Inspections, Tests, and/or Analysises) defines the specific method the licensee will use to demonstrate that the specific ~~design~~ commitment in Column 1 has been met. The methods used are inspection, test, analysis, or a combination of the three:

- Inspections are used when verification can be done by visual observations, physical examinations, walkdowns, or by reviewing records that are based on observations or examinations. The inspections required for basic configuration walkdown follow the general provisions in Tier 1, Section 1.2.
- Tests mean that either operating or establishing specified conditions to evaluate the performance of the as-built structures, systems, or components. In addition to testing final and installed equipment, examples of alternative testing methods include factory testing, test facility testing, and laboratory testing. Testing can also include type testing such as might be performed to demonstrate qualification to meet environmental requirements.
- Analysis is used when verification can be done by calculation or engineering evaluation of the as-built SSC.

For the methods used to demonstrate commitment satisfaction, supporting details are provided in Tier 2. The initial test program is described in Section 14.2 of Tier 2 and

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covers both visual inspections and tests. The details in Tier 2 are not referenced in Tier 1 CDM and are not part of the certified design.

Column 3 (Acceptance Criteria) depends upon the design feature to be verified and the method used for the verification. Acceptance criteria are objective and clear to avoid confusion over whether or not acceptance criteria have been satisfied. Some acceptance criteria contain numerical values that are not specifically identified in the Tier 1 design description or the ITAAC table **design** commitments column. This is acceptable because the design description defines the important design feature that needs to be included in the CDM, whereas the numerical value is a measurement standard that determines if the feature has been provided.

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14.3.3 Tier 1, Chapter 3, Non-System Based Design Descriptions and ITAAC

The format and selection process for Tier 1, Chapter 3 is similar to Tier 1, Chapter 2 in that it includes CDM and ITAAC tables. Tier 1, Chapter 3 addresses the following non-system based topics:

- Section 3.1 – Security.
- Section 3.2 - Reliability assurance program (RAP).
- Section 3.3 - Initial testing program (ITP).
- Section 3.4 - Human factors engineering (HFE).
- Section 3.5 - Containment isolation.

14.3.4 Tier 1, Chapter 4, Interface Requirements

Interface requirements are items to be met by the site-specific portions of a facility that are not within the scope of the certified design. The site-specific portions of the design are those that depend on site characteristics. Interface requirements define the design features and characteristics that demonstrate that the site-specific portion of the design conforms to the certified design. Interface requirements comply with 10 CFR 52.47(a)(26) requirements.

14.3.5 Tier 1, Chapter 5, Site Parameters

Tier 1, Chapter 5 defines safety-significant site parameters that are the basis for the standard plant design presented in the U.S. EPR design certification application. The list of site parameters follows the suggested list contained in SRP 14.3 and corresponds with the requirements for site parameter information contained in 10 CFR 52.47(a)(1). Compliance with these site parameters is verified during the COL application process, so no ITAAC are necessary for site parameters.

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Table 14.3-8—ITAAC Screening Summary
Sheet 1 of 8

| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|---|---------------------------------|------------------------|---------------------|------------------------|
| NSSS Support Systems | | | | |
| Chemical & Volume Control System; including RCP Seal Injection | KBA, KBD, JEW | X | X | 2.2.6 |
| Coolant Degasification System | KBG | X | | 2.2.11 |
| Coolant Purification System | KBE | X | | 2.2.12 |
| Coolant Supply &and Storage System | KBB | X | | 2.2.10 |
| Coolant Treatment System | KBF | X | | 2.2.13 |
| Fuel Handling System | FAA, FAB, FAE, FAF, FB, FC, SMF | X | X | 2.2.8 |
| Fuel Pool Cooling &and Purification System | FAK, FAL | X | X | 2.2.5 |
| Reactor Boron &and Makeup Water Makeup System | KBC | X | | 2.2.9 |
| Reactor Coolant System | | | | |
| Reactor Coolant System | JE, JA, JDA | X | X | 2.2.1 |
| Front Line Safety Systems | | | | |
| Combustible Gas Control System | JMT | X | X | 2.3.1 |
| Core Melt Stabilization System | JMB | X | X | 2.3.2 |
| Emergency Feedwater System | LAR, LAS | X | X | 2.2.4 |
| Extra Borating System | JDH | X | X | 2.2.7 |
| In-Containment Refueling Water Storage Tank System | JNK | X | X | 2.2.2 |
| Safety Injection System & and Residual Heat Removal System | JNA, JND, JNG | X | X | 2.2.3 |
| Severe Accident Heat Removal System | JMQ | X | X | 2.3.3 |
| Civil Systems | | | | |
| Cathodic Protection System | PUR | | | |
| Sewage Water Treatment System | GR | | | |
| Structures | | | | |
| Access Building | UKE | | | |
| Auxiliary Power Transformers Areas | UBE | | | |
| Buried Conduit Duct Bank | UBZ | | | |
| Buried Piping & Pipe Ducts | UMZ | | | |

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Table 14.3-8—ITAAC Screening Summary
Sheet 2 of 8

| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|--|--|------------------------|---------------------|-----------------------|
| Buried Piping & Pipe Ducts for Service Water | UQZ | | | |
| Central Gas Supply Building | UTG | | | |
| Circulating Water Intake Structure | UPC | | | |
| Circulating Water Makeup Intake Structure | UPE | | | |
| Circulating Water Pump Building | UQA | | | |
| Cooling Tower Makeup Intake Structure | UPF | | | |
| Cooling Tower Structure | URA | | | |
| Cranes, Hoists, and Elevators | SM, SN | X | X | <u>2.10.1</u> |
| Demineralized Water Storage Areas | UGG | | | |
| Emergency Power Generating Buildings | UBP | X | X | <u>2.1.2</u> |
| Essential Service Water <u>Building</u> Cooling Tower Structures | URB, <u>UQB</u> | X | X | <u>2.1.5</u> |
| Essential Service Water Pump Structures | UQB | X | X | |
| Fire Protection Storage Tanks & Building | USG | | | |
| Generator Transformer Areas | UBF | | | |
| Nuclear Auxiliary Building | UKA | X | X | <u>2.1.3</u> |
| Nuclear Island <u>Structures</u> Structural System (Fuel, Reactor, Safeguard Buildings) | UFA, UJA, UJB, UJH, UJK, UJE, JM, <u>UKH</u> | X | X | <u>2.1.1</u> |
| Office & Staff Amenities Building | UYA | | | |
| Pipe Bridge or Support Structure | UMY | | | |
| Radioactive Waste Processing Building | UKS | X | X | <u>2.1.4</u> |
| Security Access Facility | UYF | | | |
| Service Water and Circulating Water Collecting Pond | UQM | | | |
| Simulator Building | UYH | | | |
| Structure for Effluent Disposal | UGU | | | |
| Structure for Oil Collecting Pits | UBH | | | |
| Switchgear Building | UBA | | | |
| Switchyard | UAA | | | |
| Turbine Building | UMA | | | |
| Vent Stack | UKH | X | X | |

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Table 14.3-8—ITAAC Screening Summary
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| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|--|--------------------|------------------------|---------------------|-----------------------|
| Water Treatment Building | UPQ | | | |
| Workshop & Warehouse Building | UST | | | |
| Distributed Systems | | | | |
| Air Humidification System | QM | | | |
| Auxiliary Cooling Water System | PG | | | |
| Central Gas Distribution System | QJ | | | |
| Closed Cooling Water System | PG | | | |
| Component Cooling Water System | KA | X | X | <u>2.7.1</u> |
| Compressed Air System | SC | X | | <u>2.7.12</u> |
| Control Air System | QFB | | | |
| Demineralized Water Distribution System | GHC | X | | <u>2.7.9</u> |
| Domestic Waste Water Collection & Drainage System inc. Sewage | GQ | | | |
| Essential Service Water System | PE | X | <u>X</u> | <u>2.7.11</u> |
| Fire Water Distribution System | SGA, SGB | X | X | <u>2.7.5</u> |
| Gaseous Fire Extinguishing Systems | SGJ | X | X | <u>2.7.6</u> |
| Operational Chilled Water System - Nuclear Island | QNA, QNB | | | |
| Plant Drainage System | GM | | | |
| Potable &and Sanitary Water Systems | GK | X | | <u>2.7.10</u> |
| Rainwater Collection & Drainage System | GU | | | |
| Raw Water Supply System | GA | | | |
| Safety Chilled Water System | QK | X | X | <u>2.7.2</u> |
| Seal Water Supply System | GHW | X | | <u>2.7.4</u> |
| Spray Deluge Systems | SGC | X | | <u>2.7.8</u> |
| Sprinkler Systems | SGE | X | | <u>2.7.3</u> |
| Power Conversion Systems | | | | |
| Auxiliary Steam Generating System | QH | | | |
| Circulating Water Supply System (<u>Inside the Turbine Buidling</u>) | PA | X | | <u>2.8.11</u> |
| Circulating Water Treatment System | PB | | | |
| Clean Drains System | LCM | | | |

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Table 14.3-8—ITAAC Screening Summary
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| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|---|---------------------|------------------------|---------------------|-----------------------|
| Condensate System | LC, LD, MAG | X | X | <u>2.8.5</u> |
| Main Condenser Evacuation System | MAJ | X | | <u>2.8.10</u> |
| Extraction Steam System | LBQ, LBS | | | |
| Main Feedwater System | LA | X | X | <u>2.8.6</u> |
| Feedwater Heating System | LAD | | | |
| Main Steam System | LB | X | X | <u>2.8.2</u> |
| Operational Chilled Water System—Turbine Island | QNM | | | |
| Reheater Drains System | LGS | | | |
| Sealing Water System | LCW | | | |
| Secondary Sampling System | QU | X | | <u>2.8.9</u> |
| Standby Condensate Distribution System | LGR | | | |
| Steam Generator Blowdown Demineralizing System | GDA | X | | <u>2.8.8</u> |
| Steam Generator Blowdown System | LCQ | X | X | <u>2.8.7</u> |
| Turbine-Generator System | MAA | X | X | <u>2.8.1</u> |
| Turbine Building Air Vent System | MAQ | | | |
| Turbine Drains & Vents System | MAL | | | |
| Turbine Gland Steam Sealing System | MAW | X | | <u>2.8.3</u> |
| Turbine Lube Oil System | MAV | | | |
| HVAC Systems | | | | |
| Access Building Ventilation System | KLD | X | | <u>2.6.2</u> |
| Annulus Ventilation System | KLB | X | X | <u>2.6.3</u> |
| Circulating Water Pump Building Ventilation System | SAQ | | | |
| Containment Building Ventilation System | KLA | X | X | <u>2.6.8</u> |
| Electrical Division of Safeguard Building Ventilation System | SAC | X | X | <u>2.6.7</u> |
| Emergency Power Generating Building Ventilation System | SAD | X | X | <u>2.6.9</u> |
| Essential Service Water Pump Building Ventilation System | SAQ | X | X | <u>2.6.13</u> |

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Table 14.3-8—ITAAC Screening Summary
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| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|--|---|------------------------|---------------------|------------------------|
| Fuel Building Ventilation System | KLL | X | X | 2.6.4 |
| Main Control Room Air Conditioning System | SAB | X | X | 2.6.1 |
| Main Steam &and Feedwater Valve Room Ventilation System | SAM3 | X | | 2.6.12 |
| Nuclear Auxiliary Building Ventilation System | KLE | X | | 2.6.5 |
| Operational Chilled Water Ventilation System | SAM | | | |
| Radioactive Waste Processing Building Ventilation System | KLF | X | | 2.6.10 |
| Safeguard Building Controlled Area Ventilation System | KLC | X | X | 2.6.6 |
| Smoke Confinement System | SAG | X | | 2.6.11 |
| Space Heating System | SB | | | |
| Station Blackout Room Switchgear Building Ventilation System | SAL | X | | 2.6.14 |
| Switchgear Building Ventilation System, Turbine Island | SAG | | | |
| Turbine Building Ventilation System | SAM1, SAM2 | X | | 2.6.15 |
| Auxiliary Systems | | | | |
| Central Chemicals Supply System | QG | | | |
| Emergency Diesel Generator Set | XJA, XKA, XJN, XJV, XJG, XJQ, XJR, XJX, CXN | X | X | 2.5.4 |
| Decontamination System | FK | | | |
| Filter Changing Equipment | KPD | | | |
| Gaseous Waste Processing Management System | KPL | X | | 2.9.3 |
| Leak-off System | JMM | X | | 2.7.7 |
| Liquid Waste Storage & Processing Management Systems | KPK, KPF | X | | 2.9.1 |
| Nuclear Island Drain &and Vent Systems | KT | X | | 2.9.5 |
| Nuclear Sampling System | KU | X | | 2.9.6 |
| Sampling Activity Monitoring Systems | KLK | X | X | 2.9.4 |

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Table 14.3-8—ITAAC Screening Summary
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| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|--|--|------------------------|---------------------|------------------------|
| Severe Accident Sampling System | KUL | X | | 2.3.4 |
| Solid Waste Management System | KPC | X | | 2.9.2 |
| Station Blackout Alternate AC Source Diesel-Generator Set | XJA, XKA, XJN, XJV, XJG, XJQ, XJR, XJX, CXN | X | X | 2.5.3 |
| Electrical Systems | | | | |
| 12-Hour Uninterruptible Power Supply System | BRB, BRV, BRW, BRX, BUV, BUX, BRC, BRV03, BTB, BTM, BUD, BUE | X | X | 2.5.11 |
| Class 1E Uninterruptible Power Supply System | BRA, BRU01, BRW, BTD, BTP, BUC, BUW, BGA | X | X | 2.5.2 |
| Class 1E Emergency Power Supply System | BD, BM, BN | X | X | 2.5.1 |
| Lighting & Small Power System | BG, BJ, BL, BZL | X | X | 2.5.9 |
| Lightning Protection & and Grounding System | BAW | X | X | 2.5.8 |
| Non-Class 1E Uninterruptible Power Supply System | BRJ, BRU02, BTA, BTL, BUB, BUL, BUM, BRZ, BUZ | X | X | 2.5.7 |
| Normal Power Supply System | BB, BF, BH | X | X | 2.5.10 |
| Preferred (Offsite) Power Supply System | ACD | X | X | 2.5.5 |
| Power Transmission (Main Generator) System- Main Transformer, Protection & Synch | BA, CHA, MK | X | X | 2.5.6 |
| Switchyard | ACA | | | |
| Instrumentation and Control Systems | | | | |
| Accident Monitoring System | - | | | |

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Table 14.3-8—ITAAC Screening Summary
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| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|---|----------------------------|------------------------|---------------------|------------------------|
| Boron Concentration Measurement System | CPF | X | X | 2.4.11 |
| Communication System | CY | X | X | 2.4.21 |
| Control Rod Drive Control System | BU | X | X | 2.4.13 |
| Diagnostics of Rotating Machinery | JYE | | | |
| Excore Instrumentation System | JKT | X | X | 2.4.17 |
| Fatigue Monitoring System | JYL | X | | 2.4.18 |
| Hydrogen Monitoring System | JMU | X | X | 2.4.14 |
| I&C Service Center | CWS | | | |
| Incore Instrumentation System | JKS, JKQ, CNN | X | X | 2.4.19 |
| Leakage Detection Systems | JYH | X | X | 2.4.8 |
| Loose Parts Monitoring System | JYF | X | | 2.4.20 |
| Main Control Room (Human Factors) | CW | X | X | 3.4 |
| Meteorological System | GPT | | | |
| Plant Fire Alarm System | CYE | X | X | 2.4.6 |
| Plant Physical Protection Systems | CZ | | | |
| Priority &and Actuator Control System | DS, CLE6, CLF6, CLG6, CLH6 | X | X | 2.4.5 |
| Process Automation System | CR | X | X | 2.4.9 |
| Process Information &and Control System | CRU | X | X | 2.4.10 |
| Protection System | JR, CLE, CLF, CLG, CLH | X | X | 2.4.1 |
| Radiation Monitoring System | JYK | X | | 2.4.22 |
| Reactor Control, Surveillance &and Limitation System | JS, CM | X | X | 2.4.15 |
| Reactor Pressure Vessel Level Measurement System | JKR | X | X | 2.4.16 |
| Remote Shutdown Station (Human Factors) | CXA | X | X | 3.4 |
| Safety Automation System | DR, CXN | X | X | 2.4.4 |
| Safety Information &and Control System | CWY | X | X | 2.4.2 |
| Security Alarm System | CZD | | | |

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Table 14.3-8—ITAAC Screening Summary
Sheet 8 of 8

| Structure, System, or Component | System KKS Code(s) | Within Scope of Tier 1 | Has ITAAC in Tier 1 | <u>Tier 1 Section</u> |
|---|--------------------|------------------------|---------------------|-----------------------|
| Seismic Monitoring System | CPE | X | X | <u>2.4.7</u> |
| Severe Accident Instrumentation & Control System <u>I&C</u> | JZ, CS | X | X | <u>2.4.3</u> |
| Technical Support Center (<u>Human Factors</u>) | CWT | X | X | <u>3.4</u> |
| Turbine - Generator Instrumentation & Control <u>I&C</u> | - | X | | <u>2.4.23</u> |
| Vibration Monitoring System | JYG, JYM | X | | <u>2.4.12</u> |

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2.4.8 Leakage Detection System

1.0

Description

~~The leakage detection system (LDS), in combination with instrumentation from other interconnected systems, detects, quantifies, and determines the location of leakage from the reactor coolant pressure boundary (RCPB) and select portions of the main steam (MS) system.~~

~~The LDS provides the following non-safety related functions:~~

- ~~• Provides a method of collecting and quantifying selected RCPB leakage.~~
- ~~• Provides the primary method of detecting and quantifying leakage from the MS system.~~
- Provides indications of leak rates and leak locations to the plant operators in the main control room (MCR).

There are no Tier 1 entries for this system.

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2.8.4

~~Sealing Steam System~~ Deleted

There are no Tier 1 entries for this system.