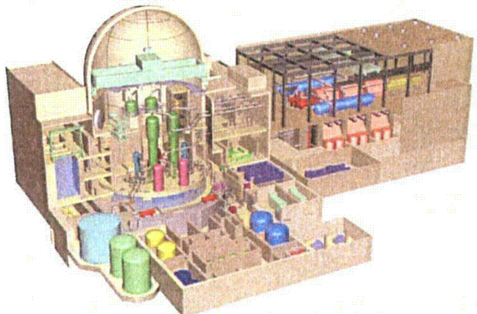
MNES
MITSUBISHI NUCLEAR ENERGY SYSTEMS, INC.
Luminant
Dominion
US-APWR

DCWG Meeting
Tier 1 Enhancement Effort – Tier 1, Section 2.6



January 20, 2011
Mitsubishi Nuclear Energy Systems, Inc.

Agenda

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- Introduction
- Meeting objectives
- Overview of project objectives and approach
- Discuss Section 2.6
- Open discussion

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Introduction

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- In June, 2010, MHI/MNES, Luminant, and Dominion initiated a Tier 1 enhancement effort.
- This effort is using an integrated team review approach and the current NRC ITAAC content guidance.
- Approach discussed with NRC at DCWG meeting, Nov. 3, 2010.
- Current status of Tier 1 Sections

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Meeting Objectives

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- Present Tier 1 enhancements to NRC reviewers to facilitate their review of changes
- Review the approach used to identify Tier 1 changes and solicit NRC feedback
- Solicit NRC feedback on:
  - Specific Tier 1, Section 2.6 changes
  - "Generic" ITAAC changes used in Tier 1, Section 2.6
- Identify improvements for follow-on meetings

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Objectives of Tier 1 Changes

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- Incorporate recent NRC guidance into existing ITAAC and Tier 1 design descriptions using engineering judgment and considering recent industry experience
- Facilitate the NRC's "Inspection Focus, Logic, and Practicality" review effort of ITAAC in the DCD review process
- Facilitate ITAAC completion, inspection, and closure effort
- Minimize potential impacts on construction and operations

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Results of Tier 1 Review

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- Redline/strikeout of DCD Tier 1 sections
  - Consistent wording for "generic" ITAAC (e.g., seismic, ASME Code, equipment qualification)
- "Basis" document to accompany each Tier 1 Section change package that:
  - Provides a "roadmap" for changes to the Design Descriptions and ITAAC
  - Provides an explanation/basis for the changes
  - Identifies changes that alter RAI responses previously submitted by MHI

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Discuss Section 2.6 Changes

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- Refer to markup Tier 1 pages and Basis documents

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Areas for Improvement Discussion

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- Open discussion

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"Generic" System Functional Arrangement ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	1. The functional arrangement of the ac electric power systems is as described in the Design Description of Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.	1. Inspection of the as-built ac electric power systems will be performed.	1. The as-built ac electric power systems conform to the functional arrangement as described in the Design Description of Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.
Electrical ITAAC 2.6.1 #1 Also applies to: 2.6.2 #1 2.6.3 #1 2.6.4 #1 2.6.5 #1 2.6.6 #2	1. The functional arrangement of the ac electric power systems is as described in the Design Description of ~~this~~ Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.	1. ~~An i~~Inspection of the as-built ac electric power systems will be performed.	1. The as-built ac electric power systems conform to the functional arrangement as described in the Design Description of ~~this~~ Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.
Basis	Editorial changes were made for clarity and consistency.		

"Generic" Seismic Category I ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	6.a The seismic Category I Class 1E ac electrical power system equipment, identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.	6.a.i Inspections will be performed to verify that the seismic Category I as-built Class 1E ac electrical power system equipment identified in Table 2.6.1-1, is located in a seismic Category I structure.	6.a.i The seismic Category I as-built Class 1E ac electric power system equipment, identified in Table 2.6.1-1, is located in a seismic Category I structure.
Electrical ITAAC 2.6.1 #6.a.i Also applies to: 2.6.2 #2 2.6.3 #3 2.6.4 #6 2.6.8 #2	6.a The seismic Category I ~~Each of the four divisions of the~~ Class 1E acAC electrical power system equipment, identified in Table 2.6.1-1, can~~is designed to~~ withstand seismic design basis loads without loss of safety function.	6.a.i Inspections will be performed to verify that the seismic Category I as-built Class 1E ac electrical power system equipment identified in Table 2.6.1-1, is located in a seismic Category I structure~~the reactor building~~.	6.a.i The seismic Category I~~Each of the four divisions of the~~ as-built Class 1E ac~~AC~~ electric power system equipment, identified in Table 2.6.1-1, is located in a seismic Category I structure~~the reactor building~~.
Basis	The DC, ITA, and AC are modified to add the clarifying text "seismic Category I" to clearly identify the equipment that is within the scope of the ITAAC. A reference to a table is provided, where needed. [RIS 2008-05, "Standardization and Consistency," 2nd bullet]. The DC is modified to replace "is designed to withstand" with "can withstand." The intent of the ITAAC is to verify that the as-built equipment meets the design requirements [RIS 2008-05, "Focus, Logic, and Practicality," 5th and 6th bullets]. The ITA and AC are modified to replace "reactor building" with "seismic Category I structure" in order to create a generic ITAAC template [RIS 2008-05, "Nomenclature and Language," 3rd bullet].		

"Generic" Seismic Category I ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	This wording is similar to corresponding ITAAC previously presented in one or more DCDs for other technologies.		

"Generic" Seismic Category I ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	6.a The seismic Category I Class 1E ac electrical power system equipment, identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.	6.a.ii Type tests, analysis or a combination of type tests and analyses of seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	6.a.ii A report exists and concludes that the seismic Category I Class 1E ac electric power system equipment identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.
Electrical ITAAC 2.6.1 #6.a.ii Also applies to: 2.6.2 #2 2.6.3 #3 2.6.4 #6 2.6.8 #2	6.a The seismic Category I Each of the four divisions of the Class 1E acAC electrical power system equipment, identified in Table 2.6.1-1, canis designed to withstand seismic design basis loads without loss of safety function.	6.a.ii Type tests, analysis or a combination of type tests and and/or analyses of the seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	6.a.ii A report exists and concludes The results of the type tests and/ior analyses conclude that the seismic Category I each of the four divisions of the as-built Class 1E acAC electric power system equipment identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.

"Generic" Seismic Category I ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
Basis		The ITA is modified to identify that "type tests," "analysis," or a combination of these is acceptable [RIS 2008-05, "ITAAC Nomenclature and Language," 4th bullet]. "And/or" is also deleted [RIS 2008-05, "Nomenclature and Language," 4th bullet]. The ITA is modified to clarify the conditions that apply to the type tests and analyses. This wording is consistent with corresponding ITAAC in the ESBWR DCD. The AC is modified to add the phrase "a report exists and concludes" for consistency with the analysis identified in the ITA [RIS 2008-05, "Focus, Logic, Practicality," 7th bullet]. This wording is consistent with corresponding ITAAC in the AP1000 DCD.	

"Generic" Seismic Category I ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	6.a The seismic Category I Class 1E ac electrical power system equipment, identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.	6.a.iii Inspection and analysis will be performed to verify that the as-built seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.	6.a.iii A report exists and concludes that the as-built seismic Category I Class 1E ac electric power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.
Electrical ITAAC 2.6.1 #6.a.iii Also applies to: 2.6.2 #2 2.6.3 #3 2.6.4 #6 2.6.8 #2	6.a The seismic Category I ~~Each of the four divisions of the~~ Class 1E ac~~AC~~ electrical power system equipment, identified in Table 2.6.1-1, can~~is designed to~~ withstand seismic design basis loads without loss of safety function.	6.a.iii. Inspection and analysis will be performed to verify that ~~on~~ the as-built seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.	6.a.iii A report exists and concludes that~~Each of the four divisions of~~ the as-built seismic Category I Class 1E ac~~AC~~ electric power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.
Basis		The ITA is modified to add "analysis" to recognize that inspection alone is not sufficient to verify the as-built equipment is bounded by the tested or analyzed condition [RIS 2008-05, "Focus, Logic, Practicality," 6th and 7th bullets].	

"Generic" Seismic Category I ITAAC			
	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
		The ITA is modified to clarify the conditions that apply to the type tests and analyses. This wording is consistent with corresponding ITAAC in the ESBWR DCD. The AC is modified to add "a report exists and concludes" for consistency with the analysis identified in the ITA [RIS 2008-05, "Focus, Logic, Practicality," 7th bullet]. This wording is consistent with corresponding ITAAC in the AP1000 DCD.	

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	26.a.i The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	26.a.i Inspection of the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, will be performed.	26.a.i The ASME Code Section III data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
Electrical ITAAC 2.6.4 #26.a.i Also applies to: 2.6.4 #26.b.i (piping)	26.a.i The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	26.a.i ~~An~~Iinspection of the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, will be performed.	26.a.i The ASME Code Section III data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
			conclude that the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
Basis	This DC, ITA, and AC are modified to include a reference to a specific list of equipment, as needed [RIS 2008-05, "Standardization," 2nd bullet]. This wording is similar to corresponding ITAAC in the ESBWR DCD.		

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	26.a.ii The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are reconciled with the design requirements.	26.a.ii A reconciliation analysis of the components in Table 2.6.4-2 using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	26.a.ii The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that design reconciliation has been completed in accordance with ASME Code, for the as-built ASME Code Section III components of the EPS support systems identified in Table 2.6.4-2. The report documents the results of the reconciliation analysis.
Electrical ITAAC 2.6.4 #26.a.ii Also applies to: 2.6.4 #26.b.ii (piping)	26.a.ii The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are reconciled with the design requirements.	26.a.ii A reconciliation analysis of the components in Table 2.6.4-2 using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	26.a.ii The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that design reconciliation has been completed in accordance with ASME

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
			Code, for the as-built ASME Code Section III components of the EPS support systems identified in Table 2.6.4-2 ~~are reconciled with the design requirements~~. The report documents the results of the reconciliation analysis.
Basis	The DC, ITA, and AC have been modified to include reference to a specific list of equipment, as needed [RIS 2008-05, "Standardization," 2nd bullet]. The AC is modified to clarify that design reconciliation will be performed in accordance with what the ASME Code requires. This wording is similar to corresponding ITAAC in the ESBWR DCD.		

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	27.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.	27.a Inspection of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2, will be performed in accordance with the ASME Code Section III.	27.a The ASME Code Section III code reports exist and conclude that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2.
Electrical ITAAC 2.6.4 #27.a Also applies to: 2.6.4 #27.b (piping)	27.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.	27.a Inspections of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2, will be performed in accordance with the ASME Code Section III.	27.a The ASME Code Section III code reports exist and conclude that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2.
Basis	The DC, ITA, and AC are modified to include reference to a specific list of equipment, as needed and editorial clarification to the ITA and AC [RIS 2008-05, "Standardization," 2nd bullet].		

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	7.a The ASME Code Section III components of the Class 1E EPS support systems, identified in Table 2.6.4-2, retain their pressure boundary integrity at their design pressure.	7.a A hydrostatic test will be performed on the as-built components identified in Table 2.6.4-2 required by the ASME Code Section III to be hydrostatically tested.	7.a ASME Code Data Report(s) exists and conclude that the results of the hydrostatic test of the as-built components of the Class 1E EPS support systems, identified in Table 2.6.4-2 as ASME Code Section III conform with the requirements of ASME Code Section III.
Electrical ITAAC 2.6.4 #7.a Also applies to: 2.6.4 #7.b (piping)	7.a The ASME Code Section III components of the Class 1E EPS support systems, identified in Table 2.6.4-2, ~~for support systems that are required to support safety functions of starting and operating the Class 1E EPS,~~ retain their pressure boundary integrity at their design pressure.	7.a A h~~H~~ydrostatic test will be performed on the as-built components identified in Table 2.6.4-2 ~~of the support systems~~ required by the ASME Code Section III to be hydrostatically tested.	7.a ASME Code Data Report(s) exists and conclude that t~~T~~he results of the hydrostatic tests of the as-built components of the Class 1E EPS support systems, identified in Table 2.6.4-2 as ASME Code Section III ~~components for support systems that are required to support safety functions of starting and operating the Class 1E EPS~~ conform with the requirements of ASME

"Generic" ASME ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
			Code Section III.
Basis	This DC, ITA, and AC are modified to include a reference to a specific list of equipment, as needed [RIS 2008-05, "Standardization," 2nd bullet]. The AC is modified to clarify that ASME Code Data Reports will document the results of hydrostatic tests of ASME Code Section III components [RIS 2008-05, "Nomenclature and Language," 5th bullet]. This wording is similar to corresponding ITAAC in the ESBWR DCD.		

"Generic" MCR Alarms and Displays ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	7. Alarms and displays identified in Subsection 2.6.2.1 are provided in the MCR.	7. Inspection will be performed for retrievability of alarms and displays identified in Subsection 2.6.2.1 in the MCR.	7. Alarms and displays identified in Subsection 2.6.2.1 can be retrieved in the as-built MCR.
Electrical ITAAC 2.6.2 #7 Also applies to: 2.6.3 #14 2.6.4 #23 2.6.1 #20.a	7. Alarms and displays identified in Subsection 2.6.2.1 are provided in the MCR~~The alarms initiate in MCR to indicate Class 1E system malfunctions and status conditions~~.	7. Inspection~~A test~~ will be performed for retrievability of ~~to verify that~~alarms and displays identified in Subsection 2.6.2.1 in the MCR~~initiate in the as-built MCR to indicate the as-built Class 1E system malfunctions and status conditions~~.	7. ~~The results of the test conclude that the a~~Alarms and displays identified in Subsection 2.6.2.1 can be retrieved ~~initiate~~in the as-built MCR~~to indicate the as-built Class 1E system malfunctions and status conditions~~.
Basis	The DC is modified to clarify the scope of alarms and displays, as needed, and to indicate in the DC that the design does provide these items. In some cases, the DC addresses alarms only or displays only. The ITA and AC are modified from a test to an inspection for "retrievability" and that the alarms and displays can be retrieved, to provide a more appropriate verification method consistent with digital I&C systems. A new definition has been added to Tier 1, Section 1.0 to read as follows: **Inspect for retrievability** of a display or alarm means to visually observe that the specified information appears on a monitor when summoned by the operator. This approach is consistent with the ESBWR DCD.		

"Generic" MCR Controls ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
"Generic" Wording (yellow highlight identifies generic wording)	18. Controls are provided in the MCR and the Class 1E EPS room to start and stop each Class 1E EPS.	18. Tests will be performed on each as-built Class 1E EPS using the controls in the as-built MCR and the Class 1E EPS room.	18. Controls in the as-built MCR and the Class 1E EPS room start and stop each Class 1E EPS.
Electrical ITAAC 2.6.4 #18 Also applies to: 2.6.5 #8	18. Controls are provided in ~~Each Class 1E EPS can be controlled from~~ the MCR and ~~from~~ the Class 1E EPS room to start and stop each Class 1E EPS.	18. Tests ~~A test~~ will be performed on ~~to verify control of~~ each as-built Class 1E EPS using the controls in the as-built MCR and the Class 1E EPS room.	18. ~~The results of the test conclude that each as-built EPS can be controlled from the~~ Controls in the as-built MCR and ~~from~~ the Class 1E EPS room start and stop each Class 1E EPS.
Basis	The DC, ITA, and AC are modified to specify/reflect a functional test. For this ITAAC, the AC is modified to delete the phrase "the results of the test conclude" to provide a functional AC and to be consistent with other similar AC.		

"Generic" Equipment Qualification ITAAC			
	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
"Generic" Wording (yellow highlight identifies generic wording)	7. Each EPA as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	7.i Type tests or a combination of type tests and analyses using the design environmental conditions or under the conditions which bound the design environmental conditions will be performed on the EPAs located in a harsh environment.	7.i A report exists and concludes that each EPA as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
		7.ii Inspection will be performed on each as-built EPA located in a harsh environment.	7.ii Each as-built EPA as being qualified for a harsh environment is bounded by type tests, or a combination of type tests and analyses.
Electrical ITAAC 2.6.8 #7	7. Each EPA as being qualified for a harsh environment can ~~is designed to~~ withstand the environmental conditions that would exist before, during, and following a design basis accident ~~event~~ without loss of safety function for the time	7.i Type tests or a combination of type tests and ~~and/or~~ analyses using the design environmental conditions or under the conditions which bound the design environmental conditions will be performed on the EPAs located in a harsh environment.	7.i A report exists and concludes ~~The results of the type tests and/or analyses conclude~~ that each EPA as being qualified for a harsh environment can withstand the environmental

"Generic" Equipment Qualification ITAAC			
	Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	required to perform the safety function.		conditions that would exist before, during, and following a design basis accident ~~event~~ without loss of safety function for the time required to perform the safety function.
		7.ii Inspection will be performed on each as-built EPA located in a harsh environment.	7.ii Each as-built EPA as being qualified for a harsh environment is bounded by type tests, or a combination of type tests and ~~and/or~~ analyses.
Basis	The DC is modified to replace "is designed to withstand" with "can withstand." The intent of the ITAAC is to verify that the as-built equipment meets the design requirements [RIS 2008-05, "Focus, Logic, and Practicality," 5th and 6th bullets]. The DC and AC are modified from "design basis event" to "design basis accident," to be consistent with the Tier 1 definition of "harsh environment." The ITA is modified to use the phrase "type tests or a combination of type tests and analyses," and "and/or" was deleted because analysis alone is not sufficient. The ITA is also modified to clarify the conditions that apply to the type tests and analyses. This wording is consistent with corresponding ITAAC in the ESBWR DCD. "A report exists and concludes," is added to the AC to document the results of the analysis.		

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.1

Item No.	Explanation/Basis for Change
Design Description 2.6.1	
A	Two sentences removed from introduction because they are discussed in more detail in the Design Description, items E, F, and G.
B	Paragraph relocated to introduction for consistency. See item D.
C	Reworded to be consistent with functional description DC and eliminate redundant text.
D	Paragraph relocated to introductory paragraph. See item B.
E	Note 1
F	Notes 1 and 2. See item NN.
G	Sentence deleted because it was redundant (see item E). See Note 1 for other changes. This change alters the response to RAI 182, 14.03.06-8.
H	Sentence deleted because it was redundant to Tier 1 section 2.12. ITAAC are addressed in Table 2.12-1.
I	Note 1. This change does not impact the response to RAI 182, 14.03.06-8.
J	Note 1
K	Seismic aspect of sentence relocated (See items J, JJ and KK). Environmental qualification (EQ) of equipment addressed in individual system ITAAC. No EQ (i.e. harsh environment) requirements for equipment in Table 2.6.1-1 and no EQ ITAAC in Table 2.6.1-3.
L	Note 1
M	Note 1
N	Note 1
O	Note 1
P	Notes 1 and 2. See item OO.
Q	Notes 1 and 2. See item OO.
R	Notes 1 and 2. See item OO.
S	Notes 1 and 2. See item OO.
T	Note 2. See item PP.
U	Notes 1 and 2. See item QQ.
V	Notes 1 and 2. See item QQ.
W	Note 2. See item RR.
X	Note 2. See item SS.
Y	Note 2. See item TT.
Z	Note 2. See item UU.
AA	Note 2. See item FF.
BB	Note 2. See item GG.
CC	Notes 1 and 2. See item HH.
DD	Design Description added to be consistent with DC.
EE	Note 1 (applies to items 20.b and 20.c)
FF	Note 2. See item AA.
GG	Note 2. See item BB.
HH	Notes 1 and 2. See item CC.
II	Design Description added to be consistent with DC.
JJ	Notes 1 and 2. See item K.
KK	Notes 1 and 2. See item K.

Item No.	Explanation/Basis for Change
LL	Text deleted. See ITAAC item #9 below.
MM	Text deleted because it is redundant to the Design Description in Subsection 2.6.5.1. ITAAC addressed in Table 2.6.5-1 #3.
NN	Note 2. See item F.
OO	Notes 1 and 2. See items P, Q, R, and S.
PP	Note 2. See item T.
QQ	Notes 1 and 2. See items U and V.
RR	Note 2. See item W.
SS	Note 2. See item X.
TT	Note 2. See item Y.
UU	Note 2. See item Z.
Table 2.6.1-1	
	No changes
Table 2.6.1-2	
	No changes
ITAAC Table 2.6.1-3	
1	DC, AC – Editorial changes
2	DC and ITA – Note 1. Changes do not impact response to RAI 193, 14.03.06-23 or RAI 182, 14.03.06-7. [RIS p7, Consistency, second bullet]
3	DC – The term "non-safety related" is replaced by "non-Class 1E" to make consistent with terminology used in Tier 2, Section 8.3. [RIS p3, Nomenclature, second bullet] – The reference to Regulatory Guide 1.75 is deleted in the DC to make consistent with Design Description, and to follow SRP Section 14.3 guidance and DCD Tier 2 Section 14.3 which specify that Tier 1 should minimize references to codes and standards. In this case a standard is endorsed by RG 1.75. This change alters part of the response to RAI 80, 09.05.03-8. [RIS p7, Consistency, third bullet] 3.i ITA – Change made to add type tests as an option. Other changes to provide consistency with DC. This change does not impact the response to RAI 80, 09.05.03-8. [RIS p7, Consistency, second bullet] 3.i AC – Change made to reference a report where "analysis" is specified in the ITA. This change does not impact the response to RAI 80, 09.05.03-8. [RIS p5, Logic, seventh bullet] 3.ii ITA, AC – Inspection added to verify intent of DC. [RIS p5, Logic, sixth bullet]
4	DC and AC – Note 1. Change does not impact response to RAI 182 14.03.06-8. [RIS p7, Scope, first bullet]
5	AC – Editorial change for clarity. Change does not impact response to RAI 182 14.03.06-8.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.1

Item No.	Explanation/Basis for Change
6.a	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
6.b	No changes
6.c	No changes
7	ITA – Change made to provide consistency with DC. Change does not impact response to RAI 182 14.03.06-9. [RIS p7, Consistency, second bullet] DC, AC – Editorial changes.
8	No changes
9	DC, ITA, AC – ITAAC deleted. This design feature is not required to be verified by ITAAC per SRP 14.3.6. No similar ITAAC identified in other current DCDs (e.g., AP1000 and ESBWR). This ITAAC would be extremely difficult to close due to the lack of verifiable, unambiguous acceptance criteria. This change alters the responses to RAI 32, 14.03-04 and RAI 424, 14.03.06-17.
10	DC, ITA, AC – EPS removed because sizing of EPS is verified in ITAAC 2.6.4-1#9. – SSTs removed because Tier 2 does not define sizing requirements for non-Class 1E SSTs. The sizing of Class 1E distribution equipment, which includes Class 1E SSTs, is specified. Sizing of Class 1E distribution equipment, including Class 1E SSTs, is addressed in ITAAC 2.6.1-3#11.a. ITAAC are not required to size non-Class 1E SSTs. This change does not impact the response to RAI 182, 14.03.06-10. 10i : AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
11.a	DC, ITA, AC – The existing wording is misleading. The DCD Tier 2 states that Class 1E equipment is sized for LOOP and LOCA, not all plant operating conditions. DCD Section 8.3 states "Any two Class 1E trains including the power sources are adequate to supply the loads required during LOOP and LOCA conditions occurring simultaneously." This change does not impact the response to RAI 182, 14.03.06-10. [RIS p7, Consistency, fourth bullet] 11.a.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
11.b	DC, ITA, AC – Change made to clarify scope of ITAAC. [RIS p7, Consistency, third bullet] 11.b.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
12	DC, ITA, AC – Change made to clarify scope of ITAAC. [RIS p7, Consistency, third bullet] 12.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]

Item No.	Explanation/Basis for Change
13	AC – Editorial change for clarity.
14	ITA – Analysis added because it is necessary to determine the adequate distance [RIS p5, Logic, sixth bullet] AC – Criteria added. [RIS p5, Logic, seventh bullet] – Change made to reference a report where "analysis" is specified in the ITA. [RIS p5, Logic, seventh bullet]
15	ITA – Analysis added because it is necessary to determine the adequate distance [RIS p5, Logic, sixth bullet] AC – Criteria added. [RIS p5, Logic, seventh bullet] – Change made to reference a report where "analysis" is specified in the ITA. [RIS p5, Logic, seventh bullet]
16	DC, ITA – Editorial changes
17	No changes
18	18.i: AC – Clarified acceptance criteria. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet] – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet] 18.ii: ITA – Testing added to confirm that the undervoltage relays operate properly. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, sixth bullet]
19	No changes
20.a	DC, ITA, AC – Generic changes to ITAAC for MCR indications to provide clarity and consistency. [RIS p5, Logic, seventh bullet].
20.b	DC, ITA, AC – New ITAAC added to provide consistency with Design Description. [RIS p7, Scope, first bullet]
20.c	DC, ITA, AC – New ITAAC added to provide consistency with Design Description. [RIS p7, Scope, first bullet]
21	ITA, AC – Inspection and test added to ITA and AC to ensure verification of DC. This change alters the response to RAI 424, 14.03.06-18. [RIS p5, Logic, sixth bullet] ITA – The phrase "Class 1E" added to provided consistency with DC. This change alters the response to RAI 424, 14.03.06-18. [RIS p7, Consistency, second bullet]
22	No changes

Item No.	Explanation/Basis for Change
23	DC, AC – Revised to clarify the intent and to provide the DC/AC in the form of a design requirement. This change alters the response to RAI 424, 14.03.06-18. [RIS p7, Scope, first bullet]
24	DC, ITA, AC – Change to provide consistency with Tier 2 terminology. This change alters the response to RAI 424, 14.03.06-18. [RIS p3, Nomenclature, second bullet]
25	DC, ITA, AC – New ITAAC to verify seismic qualification of raceway systems for Class 1E ac power system cables.
26	DC, ITA, AC – New ITAAC to verify routing of Class 1E ac electric power cables in raceway systems for Class 1E ac power system cables.
Figure 2.6.1-1	
	No changes

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6 ELECTRICAL SYSTEMS

This section describes the US-APWR electrical systems, with emphasis on the onsite power system.

The onsite power system is comprised of the alternating current (ac) electric power system and the direct current (dc) electric power system, each of which is comprised of a safety-related Class 1E power system and a non safety-related non-Class 1E power system. The purpose and function of the onsite power system is to provide power to the plant auxiliary and service loads during all modes of plant operation, including safe shutdown and accident conditions.

This section addresses the following major systems and equipment, and their key subsystems:

- AC electric power system
- DC electric power system
- Instrumentation and control (I&C) power supply system
- Emergency power sources (EPSs)
- Alternate ac (AAC) power sources
- Plant lighting systems
- Grounding and lightning protection system
- Electrical penetration assemblies

This section also provides ITAAC for each major system and safety-related support system.

The US-APWR electric systems as described herein are entirely within the scope of the certified design unless specifically indicated otherwise.

2.6.1 AC Electric Power Systems

2.6.1.1 Design Description

The ac electric power system includes the following system and components: offsite transmission system, plant switchyard, main transformer (MT), main generator (MG), generator load break switch (GLBS), unit auxiliary transformers (UATs), reserve auxiliary transformers (RATs), station service transformers (SSTs), switchgear, load centers, motor control centers (MCCs), panel boards, and cables for power, control and instrumentation. The 6.9kV buses of the onsite Class 1E ac electric power systems are supplied from offsite sources through the UATs, RATs or from onsite EPSs. Normal preferred supply to the Class 1E 6.9kV buses is through the RATs. During SBO, these buses can be powered from onsite AAC power sources. ~~Separation is maintained~~ A between these buses for all incoming circuits. Class 1E divisional independence is maintained through all voltage levels.Class 1E ac power systems have four independent redundant divisions, A, B, C and D, corresponding to four divisions of safety-related load groups except for systems containing two 100% redundant load groups. The two 100% load groups are powered from divisions A and D distribution systems identified as A1 and D1. The A1 buses can be powered from A or B division power sources, and D1 buses can be powered from D or C division power sources. B

1. The functional arrangement of the ac electrical power systems is as described in the Design Description of Subsection 2.6.1.1 and as shown in onsite electric power system configuration is depicted on Figure 2.6.1-1. Table 2.6.1-1 shows electrical and seismic classification of major Class 1E ac electrical power distribution equipment. C

Class 1E power systems have four independent redundant divisions, A, B, C and D, corresponding to four divisions of safety-related load groups except for systems containing two 100% redundant load groups. The two 100% load groups are powered from divisions A and D distribution systems identified as A1 and D1. The A1 buses can be powered from A or B division power sources, and D1 buses can be powered from D or C division power sources. D

2. Independence is providedmaintained between each division of the four divisions of the Class 1E distribution equipment and circuits, and between Class 1E distribution equipment and circuits and non-Class 1E distribution equipment and circuits. E

2.3. Independence between Class 1E electric power distribution equipment and non-Class 1E loads is provided by Class 1E qualified isolation devices. F

3.4. Independence is established between each of the four divisions of the Class 1E AC electric power system and its associated distribution equipment. Class 1E electric power distribution equipment of redundant divisions, shown in Table 2.6.1-1, is located in separate rooms in the reactor building. Areas containing Class 1E power distribution equipment are designated as vital areas and have controlled access. G H I

5. Each Class 1E The A, B, C and D EPSs isare located in a separate rooms in the power source buildings.

6.a The seismic Category I Class 1E ac electrical power system equipment, identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function. J

All Class 1E equipment and raceway are seismic Category I and qualified for postulated environmental conditions. K

6.b During all normal modes of plant operation and accident conditions, the Class 1E 6.9kV buses are powered through the RATs. If power throughfrom the RATs is not L available, the each Class 1E medium voltage buses isare automatically transferred to the UATs, if they are available.

6.c If both offsite power sources are not available, the each Class 1E medium voltage bus buses automatically connects to itstheir respective EPS. M

7. For all plant trip conditions, except for a trip due to electrical fault in the MT, MG, GLBS, UATs orand associated equipment and circuits, the GLBS opensis opened. N

7.8. For electrical faults in the MT, MG, GLBS, UATs and associated equipment and circuits, these equipment and circuits, the MT circuit breaker at the switchyard opensis opened. O

9. Deleted

10. The UATs and RATs power sources are sized for worst case loading conditions for all modes of plant operation and accident conditions. P

11.a The Class 1E distribution equipment and circuits are sized to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design basis voltage at load terminals to support accomplishment of their safety functions. Q

11.b The Class 1E cables are sized considering derating due to ambient temperature and raceway loading. R

12. The interrupting ratings of the Class 1E circuit breakers and fuses are adequate for maximum available fault currents. S

13. The MT, UATs, and RATs have their own fire deluge system, oil pit and drain system. T

14. The UATs power feeders are separated from RATs power feeders. U

15. The MT and GLBS power feeders are separated from the RATs power feeders. V

16. The dc control power for Class 1E switchgear and load centers of each division is supplied from the same division of the dc system. W

17. Equipment and circuits of each Class 1E division are uniquely identified. X

18. The Class 1E equipment is protected from sustained degraded voltage conditions. Y

19. There is no provision for automatic connection between redundant Class 1E buses. Z

Class 1E ac electric distribution system overcurrent protection is set for proper coordination. AA

The post-fire safe-shutdown circuit analysis ensures that one success path of shutdown SSCs remains free of fire damage. BB

The potential effects of harmonics introduced by non-linear loads are evaluated for effects on Class 1E equipment. CC

20.a Displays of voltage and current of the Class 1E medium voltage buses are provided in the MCR. DD

20.b Controls are provided in the MCR and locally to open and close the Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2.have local and remote control and status displays in the MCR. See Table 2.6.1-2 for details. EE

20.c Displays of the Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2 are provided in the MCR.

21. Class 1E ac electric distribution system overcurrent protection is set for proper coordination. FF

22. The post-fire safe-shutdown circuit analysis ensures that one success path of shutdown SSCs remains free of fire damage. GG

23. The potential effects on Class 1E equipment of harmonics introduced by non-linear loads are maintained within requirements. HH

21.24. The non-segregated busducts/cable buses to Class 1E buses in the T/B electrical room are segregated into two groups by qualified fire barriers. II

25. The raceway systems for Class 1E ac electric power system cables can withstand seismic design basis loads without loss of safety function. JJ

26. The Class 1E ac electrical power system cables are routed in raceway systems for Class 1E ac power system cables within their respective division. KK

The Class 1E ac power systems are designed to permit periodic inspection and testing at appropriate intervals in order to assess system continuity, availability and the condition of system components. Class 1E ac power systems are designed to provide the capability to perform integral periodic testing of safety systems. LL

The connection between the Class 1E 6.9kV buses and non-Class 1E AAC power sources is provided through two isolation devices in series, which are normally open. One Class 1E circuit breaker is provided at the Class 1E 6.9kV switchgear and the other is a non-Class 1E disconnect switch at the selector circuits. MM

Independence is maintained between Class 1E electric power distribution equipment and non safety-related loads by Class 1E qualified isolation devices. NN

UATs, RATs, SSTs and EPSs are sized for worst case loading conditions for all normal modes of plant operation, including safe shutdown and accident conditions. The Class OO

~~1E distribution equipment and circuits are sized to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design basis voltage at load terminals for all modes of plant operation and accident conditions. Cables are sized considering their potential derating due to ambient temperature and raceway loading~~. ~~The interrupting ratings of the circuit breakers and fuses are adequate for maximum available fault currents.~~

~~The MT, UATs, and RATs have their own fire deluge system, oil pit and drain system.~~ PP

~~Power feeders for the RATs, UATs, EPSs and AAC power sources are separated from each other. Power feeders for the MT and GLBS are separated from the RATs, EPSs and AAC power sources.~~ QQ

~~The dc control power for Class 1E switchgear and load centers of each division are supplied from the same division of the dc system.~~ RR

~~Equipment and circuits of each Class 1E division are uniquely identified.~~ SS

~~Class 1E equipment are protected from sustained degraded voltage conditions.~~ TT

~~There is no provision for automatic connection between redundant Class 1E buses.~~ UU

2.6.1.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.1-3 describes the ITAAC for the onsite electric power system.

Table 2.6.1-1 AC Electric Power Systems – Safety-related Equipment Characteristics

Equipment Name	Seismic Category	Class 1E/Qual. for Harsh Environ.
A-Class 1E 6.9kV Switchgear	I	Yes/No
B-Class 1E 6.9kV Switchgear	I	Yes/No
C-Class 1E 6.9kV Switchgear	I	Yes/No
D-Class 1E 6.9kV Switchgear	I	Yes/No
A-RCP Trip Switchgear	I	Yes/No
B-RCP Trip Switchgear	I	Yes/No
C-RCP Trip Switchgear	I	Yes/No
D-RCP Trip Switchgear	I	Yes/No
A-Class 1E 480V Load Center	I	Yes/No
A1-Class 1E 480V Load Center	I	Yes/No
B-Class 1E 480V Load Center	I	Yes/No
C-Class 1E 480V Load Center	I	Yes/No
D-Class 1E 480V Load Center	I	Yes/No
D1-Class 1E 480V Load Center	I	Yes/No
A-Class 1E Motor Control Center	I	Yes/No
A1-Class 1E Motor Control Center	I	Yes/No
B-Class 1E Motor Control Center	I	Yes/No
C-Class 1E Motor Control Center	I	Yes/No
D-Class 1E Motor Control Center	I	Yes/No
D1-Class 1E Motor Control Center	I	Yes/No

Table 2.6.1-2 AC Electric Power Systems Equipment Displays and Control Functions

Equipment Name	MCR Display	MCR Control Function
A-Class 1E 6.9kV Switchgear	Yes	Yes (Breaker open/close)
B-Class 1E 6.9kV Switchgear	Yes	Yes (Breaker open/close)
C-Class 1E 6.9kV Switchgear	Yes	Yes (Breaker open/close)
D-Class 1E 6.9kV Switchgear	Yes	Yes (Breaker open/close)
A-RCP Trip Switchgear	Yes	Yes (Breaker open/close)
B-RCP Trip Switchgear	Yes	Yes (Breaker open/close)
C-RCP Trip Switchgear	Yes	Yes (Breaker open/close)
D-RCP Trip Switchgear	Yes	Yes (Breaker open/close)
A-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
A1-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
B-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
C-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
D-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
D1-Class 1E 480V Load Center	Yes	Yes (Breaker open/close)
A-Class 1E Motor Control Center	Yes	No
A1-Class 1E Motor Control Center	Yes	No
B-Class 1E Motor Control Center	Yes	No
C-Class 1E Motor Control Center	Yes	No
D-Class 1E Motor Control Center	Yes	No
D1-Class 1E Motor Control Center	Yes	No
Unit Auxiliary Transformer (UAT 1, 2, 3, 4)	Yes	No
Reserve Auxiliary Transformer (RAT 1, 2, 3, 4)	Yes	No

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the ac electric power systems is as described in the Design Description of this Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.	1. An inspection of the as-built ac electric power systems will be performed.	1. The as-built ac electric power systems conform to the functional arrangement as described in the Design Description of this Subsection 2.6.1.1 and as shown in Figure 2.6.1-1.
2. Independence is providedmaintained between each of the four divisions of the Class 1E distribution equipment and circuits, and between Class 1E distribution equipment and circuits and non-Class 1E distribution equipment and circuits.	2. Tests will be performed on the as-built Class 1E and non-Class 1E distribution equipment and circuits by providing a test signal in only one division at a time.	2. The test signal exists in the as-built Class 1E division or non-Class 1E division under test.
3. Independence -between Class 1E electric power distribution equipment and non-Class 1E safety-related loads is providedmaintained by Class 1E qualified isolation devices so as to meet RG 1.75.	3.i Type tests, and analyses, or a combination of type test and analyses will be performed on the as-built Class 1E electric power distribution equipment will be performed to verify the qualification of isolation devices.	3.i A report exists and concludes that Tthe as-built Class 1E electric power distribution equipment is isolated from the as-built non-Class 1E safety related loads by the Class 1E qualified isolation devices so as to meet RG 1.75.
	3.ii Inspection will be performed of the as-built Class 1E electric power distribution equipment.	3.ii Independence between the as-built Class 1E electric power distribution equipment and non-Class 1E loads is provided by Class 1E qualified isolation devices.
4. The Class 1E electric power distribution equipment of redundant divisions, shown in Table 2.6.1-1, is located in separate rooms in the reactor building.	4. An inspection of the as-built Class 1E electric power distribution equipment will be performed.	4. The as-built Class 1E electric power distribution equipment of redundant divisions, shown in Table 2.6.1-1, is located in the separate rooms in the reactor building.
5. Each Class 1E EPS is located in a separate room in the power source buildings.	5. An inspection of the as-built EPS will be performed.	5. EachThe as-built each Class 1E EPS is located in a separate room in the power source buildings.

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.a The seismic Category IEach of the four divisions of the Class 1E acAC electrical power system equipment, identified in Table 2.6.1-1, canis designed to withstand seismic design basis loads without loss of safety function.	6.a.i Inspections will be performed to verify that the seismic Category I as-built Class 1E ac electrical power system equipment identified in Table 2.6.1-1, is located in a seismic Category I structurethe reactor building.	6.a.i The seismic Category IEach of the four divisions of the as-built Class 1E acAC electric power system equipment, identified in Table 2.6.1-1, is located in a seismic Category I structurethe reactor building.
	6.a.ii Type tests, analysis or a combination of type tests and and/or analyses of the seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	6.a.ii A report exists and concludes The results of the type tests and/or analyses conclude that the seismic Category I each of the four divisions of the as-built Class 1E acAC electric power system equipment identified in Table 2.6.1-1, can withstand seismic design basis loads without loss of safety function.
	6.a.iii. Inspection and analysis will be performed to verify that on the as-built seismic Category I Class 1E ac electrical power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.	6.a.iii A report exists and concludes thatEach of the four divisions of the as-built seismic Category I Class 1E acAC electric power system equipment identified in Table 2.6.1-1, including anchorages, is seismically bounded by the tested or analyzed conditions.
6.b If power through the RATs is not available, each Class 1E medium voltage bus is automatically transferred to the UATs, if available.	6.b A test will be performed to verify that each as-built Class 1E medium voltage bus is automatically transferred to the UAT upon simulated loss of power from the RAT.	6.b Each as-built Class 1E medium voltage bus is automatically transferred to the UAT if power through the RATs is not available.
6.c If both offsite power sources are not available, each Class 1E medium voltage bus automatically connects to its respective EPS.	6.c A test will be performed to verify that each as-built Class 1E medium voltage bus automatically connects to the respective EPS upon simulated loss of power from the RAT and UAT.	6.c Each as-built Class 1E medium voltage bus automatically connects to its respective EPS if both offsite power sources are not available.

7. For all plant trip conditions, except for a trip due to electrical fault in the MT, MG, GLBS, UATs orand associated equipment and circuits, the GLBS opens.	7. A test will be performed to verify that the as-built GLBS is opened by a simulated non-electrical fault trip signal, including a simulated ECCS actuation signal for each plant trip condition except for a trip due to an electrical fault in the MT, MG, GLBS, UATs or associated equipment and circuits.	7. For all plant trip conditions, except for a trip due to electrical fault in the MT, MG, GLBS, UATs orand associated equipment and circuits, the as-built GLBS opens.

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. For electrical faults in the MT, MG, GLBS, UATs and associated equipment and circuits, the MT circuit breaker at the switchyard opens.	8. A test will be performed to verify that the as-built MT circuit breaker trip signal is actuated by a simulated electrical fault trip signal for a fault in the MT, MG, GLBS, UATs and associated equipment and circuits.	8. For electrical faults in the MT, MG, GLBS, UATs and associated equipment and circuits, the as-built MT circuit breaker at the switchyard opens.
9. ~~The Class 1E ac power systems are designed to permit appropriate periodic inspection and testing in order to assess the system continuity, availability and condition of the system components.~~Deleted	9. ~~Inspections and testing of the as-built Class 1E ac power systems will be performed.~~Deleted	9. ~~Periodic inspection and testing of the as-built Class 1E ac power systems can be performed in order to assess the system continuity, availability and condition of the system components.~~Deleted
10. The UATs and~~,~~ RATs~~, SSTs and EPS~~ power sources are sized for worst case loading conditions for all modes of plant operation and accident conditions.	10.i Analyses will be performed to verify the UATs and~~,~~ RATs~~, SSTs and EPS~~ power sources are sized for worst case loading conditions for all modes of plant operation and accident conditions.	10.i A report exists and concludes that ~~T~~the UATs and~~,~~ RATs~~, SSTs and EPS~~ power sources are sized for worst case loading conditions for all modes of plant operation and accident conditions.
	10.ii Inspections will be performed to verify that the ratings of as-built UATs and~~,~~ RATs~~, SSTs and EPS~~ power sources meet the size requirements determined by the analysis for worst case loading conditions for all modes of plant operation and accident conditions.	10.ii The ratings of as-built UATs and~~,~~ RATs~~, SSTs and EPS~~ power sources bound the size requirements determined by the analysis for worst case loading conditions for all modes of plant operation and accident conditions.

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 4 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11.a The Class 1E distribution equipment and circuits are sized to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design basis voltage at load terminals <u>to support accomplishment of their safety functions</u>~~for all modes of plant operation and accident conditions~~.	11.a.i Analyses will be performed to verify the Class 1E distribution equipment and circuits are sized to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design basis voltage at load terminals <u>to support accomplishment of their safety functions</u>~~for all modes of plant operation and accident conditions~~.	11.a.i <u>A report exists and concludes that t</u>~~T~~he Class 1E distribution equipment and circuits are sized to carry the worst case load currents, can withstand the maximum fault currents, and are able to provide minimum design basis voltage at load terminals <u>to support accomplishment of their safety functions</u>~~for all modes of plant operation and accident conditions~~.
	11.a.ii An inspection will be performed to verify that the ratings of as-built Class 1E distribution equipment and circuits bound the results of the analysis to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design basis voltage at load terminals <u>to support accomplishment of their safety functions</u>~~for all modes of plant operation and accident conditions~~.	11.a.ii The ratings of as-built Class 1E distribution equipment and circuits bound the results of the analysis to carry the worst case load currents, can withstand the maximum fault currents, and are able to provide minimum design basis voltage at load terminals <u>to support accomplishment of their safety functions</u>~~for all modes of plant operation and accident conditions~~.
11.b The <u>Class 1E</u> cables are sized considering derating due to ambient temperature and raceway loading.	11.b.i A~~n a~~nalysis will be performed to verify the <u>Class 1E</u> cables are sized considering derating due to ambient temperature and raceway loading.	11.b.i <u>A report exists and concludes that</u> ~~T~~the <u>Class 1E</u> cables are sized considering derating due to ambient temperature and raceway loading.
	11.b.ii ~~An i~~<u>I</u>nspection will be performed to verify that the as-built <u>Class 1E</u> cables' size bounds the minimum size determined by the analysis.	11.b.ii The as-built <u>Class 1E</u> cables' size bound the minimum size determined by the analysis.

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 5 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
12. The interrupting ratings of the Class 1E circuit breakers and fuses are adequate for maximum available fault currents.	12.i An analysis will be performed to verify interrupting ratings of the Class 1E circuit breakers and fuses are adequate for maximum available fault currents.	12.i A report exists and concludes that Tthe interrupting ratings of the Class 1E circuit breakers and fuses are adequate for maximum available fault currents.
	12.ii An inspection will be performed to verify the interrupting ratings of the Class 1E circuit breakers and fuses bound the requirements of the analysis for maximum available fault currents.	12.ii The interrupting ratings of the as-built Class 1E circuit breakers and fuses bound the requirements of the analysis for maximum available fault currents.
13. The MT, UATs, and RATs have their own fire deluge system, oil pit and drain system.	13. An inspection of the as-built fire deluge system, oil pit and drain system for the MT, UATs, and RATs will be performed.	13. The as-built MT, UATs, and RATs each have their own fire deluge system, oil pit and drain system.
14. The UATs power feeders are separated from RATs power feeders.	14. An iInspection and analysis of the as-built UATs power feeders and the as-built RATs power feeders will be performed.	14. A report exists and concludes that Tthe as-built UATs power feeders are separated from the as-built RATs power feeders by distance or physical barriers so as to minimize, to the extend practical, the likelihood of their simultaneous failure under design basis conditions.
15. The MT and GLBS power feeders are separated from the RATs power feeders.	15. An iInspection and analysis of the as-built MT, GLBS and RATs will be performed.	15. A report exists and concludes that Tthe as-built MT and GLBS power feeders are separated from the as-built RATs power feeders by distance or physical barriers so as to minimize, to the extend practical, the likelihood of their simultaneous failure under design basis conditions.
16. The dc control power for Class 1E switchgear and	16. An inspection of the as-built dc control power source of the	16. The dc control power for as-built Class 1E switchgear

load centers of each division isare supplied from the same division of the dc system.	Class 1E switchgear and load centers will be performed.	and load centers of each division isare supplied from the same division of the dc system.
17. Equipment and circuits of each Class 1E division are uniquely identified.	17. An inspection of the as-built equipment and circuits of each Class 1E division will be performed.	17. The as-built equipment and circuits of each Class 1E division are uniquely identified.

Table 2.6.1-3 AC Electric Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 6 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
18. The Class 1E equipment is protected from sustained degraded voltage conditions.	18.i An analysis will be performed to verify the Class 1E equipment is protected from sustained degraded voltages conditions.	18.i A report exists and concludes that Tthe Class 1E equipment is protected from sustained degraded voltage conditions by degraded voltage relays.
	18.ii An iInspection and test will be performed to verify -the as-built protection system bounds the result of analysis for Class 1E equipment protection from sustained degraded voltages conditions.	18.ii The as-built protection system bounds the result of analysis for Class 1E equipment protection from sustained degraded voltages conditions.
19. There is no provision for automatic connection between redundant Class 1E buses.	19. An inspection of the as-built Class 1E buses will be performed.	19. There is no provision for automatic connection between redundant as-built Class 1E buses.
20.a Displays ofThe voltage and current of the Class 1E medium voltage buses are provideddisplayed in the MCR.	20.a An iInspection will be performed for retrievability of the voltage and current displays of Class 1E medium voltage buses in the of the as-built MCR will be performed.	20.a Displays ofThe voltage and current of the Class 1E medium voltage buses can be retrieved are displayed in the as-built MCR.
20.b Controls are provided in the MCR and locally to open and close the Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2.	20.b Tests will be performed on the as-built Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2 using controls in the as-built MCR and locally.	20.b Controls in the as-built MCR and locally open and close the as-built Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2.
20.c Displays of the Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2 are provided in the MCR.	20.c Inspection will be performed for retrievability of displays of Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2 in the MCR.	20.c Displays of Class 1E 6.9kV switchgear and 480V load center buses incoming circuit breakers listed in Table 2.6.1-2 can be retrieved in the as-built MCR.
21. Class 1E ac electric distribution system overcurrent protection is set for proper coordination.	21.i Analyses of Class 1E ac electrical distribution system overcurrent protection will be performed to verify proper coordination.	21.i A report exists and concludes that the as-built Class 1E ac electric distribution system overcurrent protection is set for proper coordination.
	21.ii Inspection and test will be performed of the Class 1E ac electrical distribution system to verify that the as-built overcurrent protection system	21.ii The as-built Class 1E ac electrical distribution system overcurrent protection system bounds the results of the analysis for proper

	bounds the results of the analysis for proper coordination.	coordination.
22. The post-fire safe-shutdown circuit analysis ensures that one success path of shutdown SSCs remains free of fire damage.	22. Analyses of post fire safe shutdown circuit analysis and supporting breaker coordination will be performed.	22. A report exists and concludes that the post-fire safe-shutdown circuit analysis ensures that one success path of shutdown SSCs remains free of fire damage.
23. The potential effects on Class 1E equipment of harmonics introduced by non-linear loads are evaluated for effects on Class 1E equipmentare maintained within requirements.	23. Analyses will be performed to determine the potential effects on Cclass 1E equipment of harmonics introduced by non-linear loads.	23. A report exists and concludes that the potential effects on Class 1E equipment of harmonics introduced by non-linear loads are maintained within requirementsdo not adversely affect Class 1E equipment.
24. The non-segregated busducts/cable buses to Class 1E safety buses in the T/B electrical room are segregated into two groups by qualified fire barriers.	24. An inspection will be performed of the as-built non-segregated busducts/cable buses to Class 1Esafety buses in the T/B electrical room.	24. The as-built non-segregated busducts/cable buses to Class 1Esafety buses in the T/B electrical room are segregated into two groups by qualified fire barriers.
25. The raceway systems for Class 1E ac electric power system cables can withstand seismic design basis loads without loss of safety function.	25.i Inspections will be performed to verify that the as-built raceway systems for Class 1E ac electric power system cables are supported by a seismic Category I structure(s). 25.ii Analysis of the raceway systems for Class 1E ac electric power system cables will be performed using analytical assumptions which bound the seismic design basis requirements. 25.iii. Inspection and analysis will be performed to verify that the as-built raceway systems for Class 1E ac electric power system cables are seismically bounded by the analyzed conditions.	25.i The as-built raceway systems for Class 1E ac electric power system cables are supported by a seismic Category I structure(s). 25.ii A report exists and concludes that the raceway systems for Class 1E ac electric power system cables can withstand seismic design basis loads without loss of safety function. 25.iii A report exists and concludes that the as-built raceway systems for Class 1E ac electric power system cables are seismically bounded by the analyzed conditions.
26 The Class 1E ac electrical power system cables are routed in raceway systems for Class 1E ac electric power system cables within their respective division.	26 An inspection of the as-built Class 1E ac electrical power system cables routing will be performed.	26 The as-built Class 1E ac electrical power system cables are routed in raceway systems for Class 1E ac power system cables within their respective division.

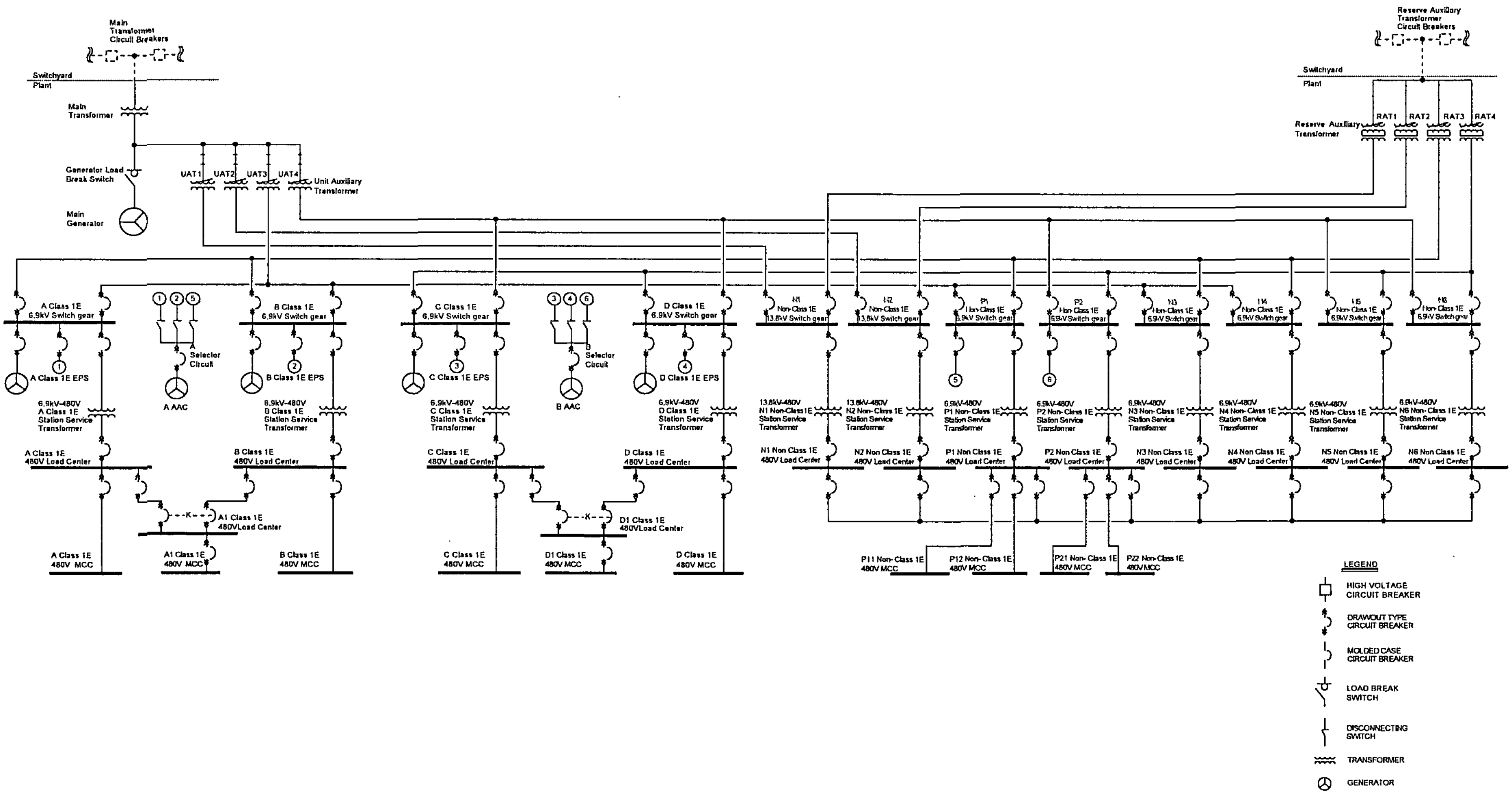

Figure 2.6.1-1 Onsite ac Power One line Diagram

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.2

Item No.	Explanation/Basis for Change
Design Description 2.6.2	
A	Editorial corrections. Text was relocated to introduction paragraph. See item L.
B	Reworded to be consistent with functional description DC.
C	Note 1. Environmental qualification (EQ) of equipment addressed in individual system ITAAC. No EQ (i.e. harsh environment) requirements for equipment in Table 2.6.2-1 and no EQ ITAAC in Table 2.6.2-2.
D	Note 1
E	Notes 1 and 2. See item H.
F	Notes 1 and 2. See item M.
G	Note 1
H	Notes 1 and 2. See item E.
I	Note 1
J	Notes 1 and 2. See item M.
K	Notes 1 and 2. See item M.
L	Text was relocated to introduction paragraph. See item A
M	Notes 1 and 2. See items F, J, and K.
N	Text deleted. See ITAAC Table 2.6.2-2, item #10.
O	Note 1
P	Note 1
Q	Note 1
R	Note 1
S	Editorial
T	Notes 1 and 2. See item U.
U	Design Description added to be consistent with DC.
Table 2.6.2-1	
	No changes
ITAAC Table 2.6.2-2	
1	DC, AC – Editorial changes
2	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
3	DC, 3.i ITA, 3.i AC – Editorial correction. 3.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet] 3.ii: ITA, AC – Correct typographical error.
4	DC, ITA – Change made to convey the intent of the DC. Change does not impact the response to RAI 182, 14.03.06-7. [RIS p5, Logic, sixth bullet]

Item No.	Explanation/Basis for Change
5	DC – The term "non-safety related" is replaced by "non-Class 1E" to make consistent with terminology used in Tier 2, Section 8.3. [RIS p3, Nomenclature, second bullet] – The reference to Regulatory Guide 1.75 is deleted in the DC to make consistent with similar Design Description in 2.6.1, and to follow SRP Section 14.3 guidance and DCD Tier 2, Section 14.3 which specify that Tier 1 should minimize references to codes and standards. In this case a standard is endorsed by RG 1.75. This change alters part of the response to RAI 80, 09.05.03-8. [RIS p7, Consistency, third bullet] ITA – Change to require more appropriate test and verification method for isolation devices. [RIS p5, Logic, sixth bullet] – Change made to provide consistency with the corresponding DC. This change alters the response to RAI 80, 09.05.03-8. [RIS p7, Consistency, second bullet] 5.i AC – Change made to reference a report where "analysis" is specified in the ITA. This change does not impact the response to RAI 80, 09.05.03-8. [RIS p5, Logic, seventh bullet] – Change made to provide consistency with the corresponding DC. This change does not impact the response to RAI 80, 09.05.03-8. [RIS p7, Consistency, second bullet] 5.ii AC – Change to provide consistency with revised ITA. [RIS p5, Logic, sixth bullet]
6	DC, ITA, AC – Revised to make consistent with Tier 2, Section 8.3.2 wording. This change alters the response to RAI 182, 14.03.06-10. [RIS p7, Consistency, fourth bullet] AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
7	DC, ITA, AC – Generic changes made to ITAAC for MCR indication for clarity and consistency. Added displays to ITAAC to be consistent with Design Description. Change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
8	DC, AC – Change made to provide clarity. [RIS p7, Scope, first bullet]
9	No changes
10	DC, ITA, AC – ITAAC deleted because it is redundant to ITAAC in Table 2.12-1.
11	DC, ITA, AC – Change made to clarify scope of ITAAC. Change does not impact the response to RAI 182, 14.03.06-13. [RIS p7, Scope, first bullet] AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]

Item No.	Explanation/Basis for Change
12	DC, ITA, AC – Note 1. Change does not impact the response to RAI 182, 14.03.06-10. [RIS p7, Consistency, third bullet] AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
13	13.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-12. [RIS p5, Logic, seventh bullet] 13.ii: AC – Change made to provide consistency with the DC. This change alters the response to RAI 182, 14.03.06-12. [RIS p7, Consistency, second bullet]
14	DC, ITA, AC – The term "safety related" is replaced by "Class 1E" to make consistent with terminology used in Tier 2, Section 8.3. Change does not impact the response to RAI 182, 14.03.06-6. [RIS p3, Nomenclature, second bullet] AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
15	DC, ITA, AC – Editorial clarification.
16	DC, ITA, AC – Existing DC wording was confusing. Change made to provide consistency with the Design Description. Cable identification is addressed in ITAAC #15. [RIS p7, Consistency, third bullet]
17	DC, ITA, AC – New ITAAC added to address seismic qualification of raceway systems for Class 1E dc power cables.
Figure 2.6.2-1	
	No changes

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.2 DC Power Systems

2.6.2.1 Design Description

The onsite dc power systems include independent Class 1E, and non-Class 1E dc power systems. Each Class 1E and non-Class 1E dc power system is provided with its own battery, battery charger, switchboard and associated power distribution equipment. Class 1E dc power systems have four independent redundant divisions A, B, C and D, corresponding to four divisions of safety load groups, except for systems containing two 100% redundant load groups. The two 100% load groups are powered ~~basically~~ from divisions A and D distribution systems identified as A1 and D1. The A1 switchboard bus can be connected to the A or B division switchboard bus, and the D1 switchboard bus can be connected to the D or C division switchboard bus. The Class 1E dc power system is provided with the following alarms and displays in the MCR: A

- Switchboard bus voltage and battery current displays
- DC system ground fault alarm
- Battery charger output voltage low alarm
- Battery charger ac input failure alarm
- Battery charger dc output failure alarm
- Battery circuit breaker/disconnect switch open alarm
- Battery charger circuit breaker open alarm
- Battery test circuit breaker closed alarm
- Battery charger common failure/trouble alarm

1. The functional arrangement of the dc electric power systems is as described in the Design Description of Subsection 2.6.2.1 and as shown in Figure 2.6.2-1~~The dc power system configuration is shown on Figure 2.6.2-1~~. B

2. The seismic Category I Class 1E dc power supply system equipment, identified in Table 2.6.2-1, can withstand seismic design basis loads without loss of safety function~~All Class 1E dc power system equipment is classified seismic Category I and qualified for postulated environmental conditions. Table 2.6.2-1 shows electrical and seismic classification of major Class 1E dc power system equipment~~. C

3. The Class 1E batteries have enough capacity to carry the worst case load profile for a duration of two hours assuming their chargers are unavailable. D

~~The Class 1E battery chargers have enough capacity to carry the continuous dc system loads and charge the associated battery (which has undergone a design basis discharge) to 95% of its full capacity within twenty-four hours.~~ E

4. Independence is provided between each of the four divisions of the Class 1E dc power system distribution equipment and circuits, and between Class 1E dc power F

system distribution equipment and circuits and non-Class 1E dc power system distribution equipment and circuits.

3.5. Independence is maintained between Class 1E dc power system distribution equipment and non--Class 1Esafety-related dc loads is provided by Class 1E qualified isolation devices. G

6. Each Class 1E battery charger has enough capacity to supply the normal dc loads of the associated 125V dc switchboard bus and charge the associated battery from the design minimum charge to 95% of its full capacity within twenty-four hours. H

4.7. Alarms and displays identified in Subsection 2.6.2.1 are provided in the MCR.Alarms initiate in MCR to indicate Class 1E dc power system malfunctions and status conditions. I

5.8. Each redundant division of Class 1E battery is located in a separate battery room. J

6.9. The Class 1E dc switchboard and battery charger of each division are located in separate rooms. K

10. Deleted

Class 1E dc power system is provided with the following alarms and available displays in the MCR: L

- Switchboard bus voltage and battery current displays
- DC system ground fault alarm
- Battery charger output voltage low alarm
- Battery charger ac input failure alarm
- Battery charger dc output failure alarm
- Battery circuit breaker/disconnect switch open alarm
- Battery charger circuit breaker open alarm
- Battery test circuit breaker closed alarm
- Battery charger common failure/trouble alarm

Independence is established between each of the four divisions of the Class 1E dc power supply system and its associated distribution equipment. The Class 1E dc power system equipment is located in separate rooms in the PS/B and R/B. M

Areas containing Class 1E dc power system distribution equipment are designated as vital areas and have controlled access. N

11. The Class 1E dc power distribution system Ccables are sized to carry required load currents and to provide minimum design basis voltage at load terminals, considering derating due to ambient temperature and raceway loading. O

7.12. The Class 1E dc system circuit breakers and fuses are sized to supply their load requirements. P

8.13. The main circuit protection device in the switchboard of each of the four Class 1E dc power divisions has selective coordination with downstream protective devices. Q

9.14. The Class 1E dc power system operating voltage range at the terminals of the Class 1E equipment is within the equipment's voltage limitis 108V to 140V at the battery terminals. R

15. The Eequipment and circuits of each division of the Class 1E dc power systems are uniquely identified. S

10.16. The Class 1E dc power cables are routed in raceway systems for Class 1E dc power cablesseismic Category I raceways within their respective division. T

17. The raceway systems for Class 1E dc power cables can withstand seismic design basis loads without loss of safety function. U

2.6.2.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.2-2 describes the ITAAC for the non-Class 1E dc power systems.

Table 2.6.2-1 DC Power System Equipment Characteristics

Equipment Name	Seismic Category	Class 1E/Qual. for Harsh Environ.
A-Class 1E Battery	I	Yes/No
B-Class 1E Battery	I	Yes/No
C-Class 1E Battery	I	Yes/No
D-Class 1E Battery	I	Yes/No
A-Class 1E Battery Charger	I	Yes/No
B-Class 1E Battery Charger	I	Yes/No
C-Class 1E Battery Charger	I	Yes/No
D-Class 1E Battery Charger	I	Yes/No
A-Class 1E DC Switchboard	I	Yes/No
B-Class 1E DC Switchboard	I	Yes/No
C-Class 1E DC Switchboard	I	Yes/No
D-Class 1E DC Switchboard	I	Yes/No
A1-Class 1E DC Switchboard	I	Yes/No
D1-Class 1E DC Switchboard	I	Yes/No
A-Class 1E MOV Inverter 1	I	Yes/No
A-Class 1E MOV Inverter 2	I	Yes/No
B-Class 1E MOV Inverter	I	Yes/No
C-Class 1E MOV Inverter	I	Yes/No
D-Class 1E MOV Inverter 1	I	Yes/No
D-Class 1E MOV Inverter 2	I	Yes/No
A-Class 1E MOV Control Center 1	I	Yes/No
A-Class 1E MOV Control Center 2	I	Yes/No
B-Class 1E MOV Control Center	I	Yes/No
C-Class 1E MOV Control Center	I	Yes/No
D-Class 1E MOV Control Center 1	I	Yes/No
D-Class 1E MOV Control Center 2	I	Yes/No

Table 2.6.2-2 DC Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 4)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the dc electric power systems is as described in the Design Description of ~~in this~~ Subsection 2.6.2.1 and as shown in Figure 2.6.2-1.	1. An inspection of the functional arrangement of the as-built dc electric power systems will be performed.	1. The as-built dc power systems conform to the functional arrangement as described in the Design Description of ~~in this~~ Subsection 2.6.2.1 and as shown in Figure 2.6.2-1.
2. The seismic Category I~~Each of the four divisions of~~ Class 1E dc power supply system equipment, identified in Table 2.6.2-1, can~~are designed to~~ withstand seismic design basis loads without loss of safety function.	2.i Inspections will be performed to verify that the seismic Category I as-built Class 1E dc power supply system equipment identified in Table 2.6.2-1 is located in a seismic Category I structure~~the PS/B and R/B~~.	2.i The seismic Category I~~Each of the four divisions of~~ as-built Class 1E dc power supply system equipment identified in Table 2.6.2-1 is located in a seismic Category I structure~~the PS/B and R/B~~.
	2.ii Type tests, analyses or a combination of type tests and ~~and/or~~ analyses of seismic Category I~~the~~ Class 1E dc power supply system equipment identified in Table 2.6.2-1 will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	2.ii A report exists and concludes that the seismic Category I~~The results of the type tests and/or analyses conclude that each of the four divisions of~~ Class 1E dc power supply system equipment identified in Table 2.6.2-1 can withstand seismic design basis loads without loss of safety function.
	2.iii Inspections and analyses~~An inspection~~ will be performed to verify that ~~on~~ the as-built seismic Category I Class 1E dc power supply system equipment identified in Table 2.6.2-1, including anchorages, is seismically bounded by the tested or analyzed conditions.	2.iii A report exists and concludes that ~~Each of the four divisions of~~ the as-built seismic Category I Class 1E dc power supply system equipment identified in Table 2.6.2-1, including anchorages, is seismically bounded by the tested or analyzed conditions.
3. The Class 1E batteries have enough capacity to carry the worst case load profile for a duration of two hours assuming chargers are unavailable.	3.i An analysis will be performed to verify Class 1E batteries have enough capacity to carry the worst case load profile for a duration of two hours assuming chargers are unavailable.	3.i A report exists and concludes that ~~T~~the Class 1E batteries have enough capacity to carry the worst case load profile for a duration of two hours assuming chargers are unavailable.

	3.ii An inspection will be performed to verify that the rating of the as-built Class 1E batteries bounds the rating of the analysis.	3.ii The rating of the as-built Class 1E batteries bounds the rating of the analysis.

Table 2.6.2-2 DC Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 4)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4. Independence is provided~~maintained~~ between each of the four divisions of the Class 1E dc power system distribution equipment and circuits, and between Class 1E dc power system distribution equipment and circuits and non-Class 1E dc power system distribution equipment and circuits.	4. Tests will be performed on the as-built Class 1E and non-Class 1E dc power system distribution equipment and circuits by providing a test signal in only one division at a time.	4. The test signal exists in the as-built Class 1E division or non-Class 1E division under test.
5. Independence between Class 1E dc power system distribution equipment and non-Class 1E ~~safety-related~~ loads is provided~~maintained~~ by Class 1E qualified isolation devices ~~so as to meet RG 1.75~~.	5.i Type ~~T~~tests, ~~and~~ analyses, or a combination of type tests and analyses will be performed ~~on the as-built Class 1E dc power system distribution equipment will be performed~~to verify the qualification of isolation devices. 5.ii Inspection will be performed of the as-built Class 1E dc power system distribution equipment.	5.i A report exists and concludes that ~~T~~the ~~as-built~~ Class 1E dc power system distribution equipment is isolated from the as-built non-Class 1E ~~safety-related~~ loads by ~~the~~ Class 1E qualified isolation devices so as to meet RG 1.75. 5.ii Independence between the as-built Class 1E dc power system distribution equipment and non-Class 1E loads is provided by Class 1E qualified isolation devices.
6. Each~~The~~ Class 1E battery charger~~s~~ has~~ve~~ enough capacity to supply the normal dc loads of the associated 125V dc switchboard bus~~carry the continuous dc system loads~~ and charge the associated battery from the design minimum charge ~~(which has undergone design basis discharge)~~ to 95% of its full capacity within twenty-four hours.	6.i An analysis will be performed to verify each~~the~~ Class 1E battery charger~~s~~ has~~ve~~ enough capacity to supply the normal dc loads of the associated 125V dc switchboard bus~~to carry the continuous dc systems loads~~ and charge the associated battery from the design minimum charge ~~(which has undergone design basis discharge)~~ to 95% of its full capacity within twenty-four hours.	6.i A report exists and concludes that each~~The~~ Class 1E battery charger~~s~~ has~~ve~~ enough capacity to supply the normal dc loads of the associated 125V dc switchboard bus ~~carry the continuous dc systems loads~~ and charge the associated battery from the design minimum charge ~~(which has undergone design basis discharge)~~ to 95% of its full capacity within twenty-four hours.
	6.ii An inspection will be performed to verify that the ratings of the as-built Class 1E battery chargers bound the ratings of the analysis.	6.ii The ratings of the as-built Class 1E battery chargers bound the ratings of the analysis.

7. Alarms and displays identified in Subsection 2.6.2.1 are provided in the MCRThe alarms initiate in MCR to indicate Class 1E system malfunctions and status conditions.	7. InspectionA test will be performed for retrievability of to verify that alarms and displays identified in Subsection 2.6.2.1 in the MCR initiate in the as-built MCR to indicate the as-built Class 1E system malfunctions and status conditions.	7. The results of the test conclude that the aAlarms and displays identified in Subsection 2.6.2.1 can be retrieved initiate in the as-built MCR to indicate the as-built Class 1E system malfunctions and status conditions.
8. Each redundant division of Class 1E battery is located in a separate battery rooms.	8. An inspection of each as-built Class 1E battery will be performed.	8. Each redundant division of as-built Class 1E battery is located in a separate battery rooms.
9. The Class 1E dc switchboard and battery charger of each division are located in separate rooms.	9. An inspection of the as-built Class 1E dc switchboard and battery charger will be performed.	9. The as-built Class 1E dc switchboard and battery charger of each division are located in separate rooms.

Table 2.6.2-2 DC Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 4)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. ~~The areas containing Class 1E dc power system distribution equipment are designated as vital areas and have controlled access.~~Deleted	10. ~~An inspection of the as-built areas containing Class 1E dc power system distribution equipment will be performed.~~Deleted	10. ~~The as-built areas containing Class 1E dc power system distribution equipment are designated as vital areas and have controlled access.~~Deleted
11. The Class 1E dc power distribution system cables are sized to carry required load currents and to provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading.	11.i An analysis will be performed to verify the Class 1E dc power distribution system cables are sized to carry required load currents and to provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading.	11.i A report exists and concludes that ~~T~~the Class 1E dc power distribution system cables are sized to carry required load currents and to provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading.
	11.ii An inspection will be performed to verify the size of as-built Class 1E dc power distribution system cables installed bound the minimum size required by the analysis.	11.ii The as-built Class 1E dc power distribution system cables are sized to bound the minimum sizes determined by the analysis.
12. The Class 1E dc system ~~equipment,~~ circuit breakers and fuses are sized to supply their load requirements.	12.i An analysis will be performed to verify the Class 1E dc system ~~equipment,~~ circuit breakers and fuses are sized to supply their load requirements.	12.i A report exists and concludes that ~~T~~the Class 1E dc system ~~equipment,~~ circuit breakers and fuses are sized to supply their load requirements.
	12.ii An inspection will be performed to verify that the ratings of the as-built Class 1E dc system ~~equipment,~~ circuit breakers and fuses bound the size requirements of the analysis.	12.ii The ratings of the as-built Class 1E dc system ~~equipment,~~ circuit breakers and fuses bound the size requirements of the analysis.
13. The main circuit protection device in the switchboard of each of the four Class 1E dc power divisions~~,~~ has selective coordination with downstream protective devices.	13.i An analysis will be performed to verify the main circuit protection devices have selective coordination with the downstream protective devices.	13.i A report exists and concludes that ~~T~~the main circuit protection device in the switchboard of each of the four Class 1E dc power divisions, has selective coordination with the downstream protective devices.

	13.ii An inspection of the as-built main circuit protection devices in the as-built switchboards will be performed.	13.ii The as-built main circuit protection devices in the as-built switchboard of each of the four Class 1E dc power divisions is are the same as thatthose used in the coordination analysis.

Table 2.6.2-2 DC Power Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 4 of 4)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14. The Class 1E dc power system operating voltage range at the terminals of the Class 1Esafety-related equipment is within the equipment's voltage limit.	14. An analysis will be performed to verify the Class 1E dc power system operating voltage range at the terminals of the Class 1Esafety-related equipment.	14. A report exists and concludes thatThe results of the analysis conclude that the Class 1E dc power system operating voltage range at the terminals of the Class 1E equipment is within the voltage limit of the as-built Class 1Esafety-related equipment.
15. The equipment and circuits of each division of the Class 1E dc power systems are uniquely identified.	15. An inspection of the as-built equipment and circuits of each division of the Class 1E dc power systems will be performed.	15. The as-built equipment and circuits of each division of the Class 1E dc power systems are uniquely identified.
16. The Class 1E dc power cables are routed in raceway systems for Class 1E dc power cables within their respective divisions through seismic Category I structures and the cables and raceways are identified the same as their respective Class 1E division.	16. An inspection of the as-built Class 1E dc power cables routing will be performed.	16. The as-built Class 1E dc power cables are routed in raceway systems for Class 1E dc power cables within their respective division through the seismic Category I structures and the cables and raceways are identified the same as their respective Class 1E division.

17. The raceway systems for Class 1E dc power cables can withstand seismic design basis loads without loss of safety function.	17.i Inspections will be performed to verify that the as-built raceway systems for Class 1E dc power system cables are supported by a seismic Category I structure(s). 17.ii Analysis of the raceway systems for Class 1E dc power cables will be performed using analytical assumptions which bound the seismic design basis requirements. 17.iii. Inspection and analysis will be performed to verify that the as-built raceway systems for Class 1E dc power cables are seismically bounded by the analyzed conditions.	17.i The as-built raceway systems for Class 1E dc power cables are supported by a seismic Category I structure(s). 17.ii A report exists and concludes that the raceway systems for Class 1E dc power cables can withstand seismic design basis loads without loss of safety function. 17.iii A report exists and concludes that the as-built raceway systems for Class 1E dc power cables are seismically bounded by the analyzed conditions.

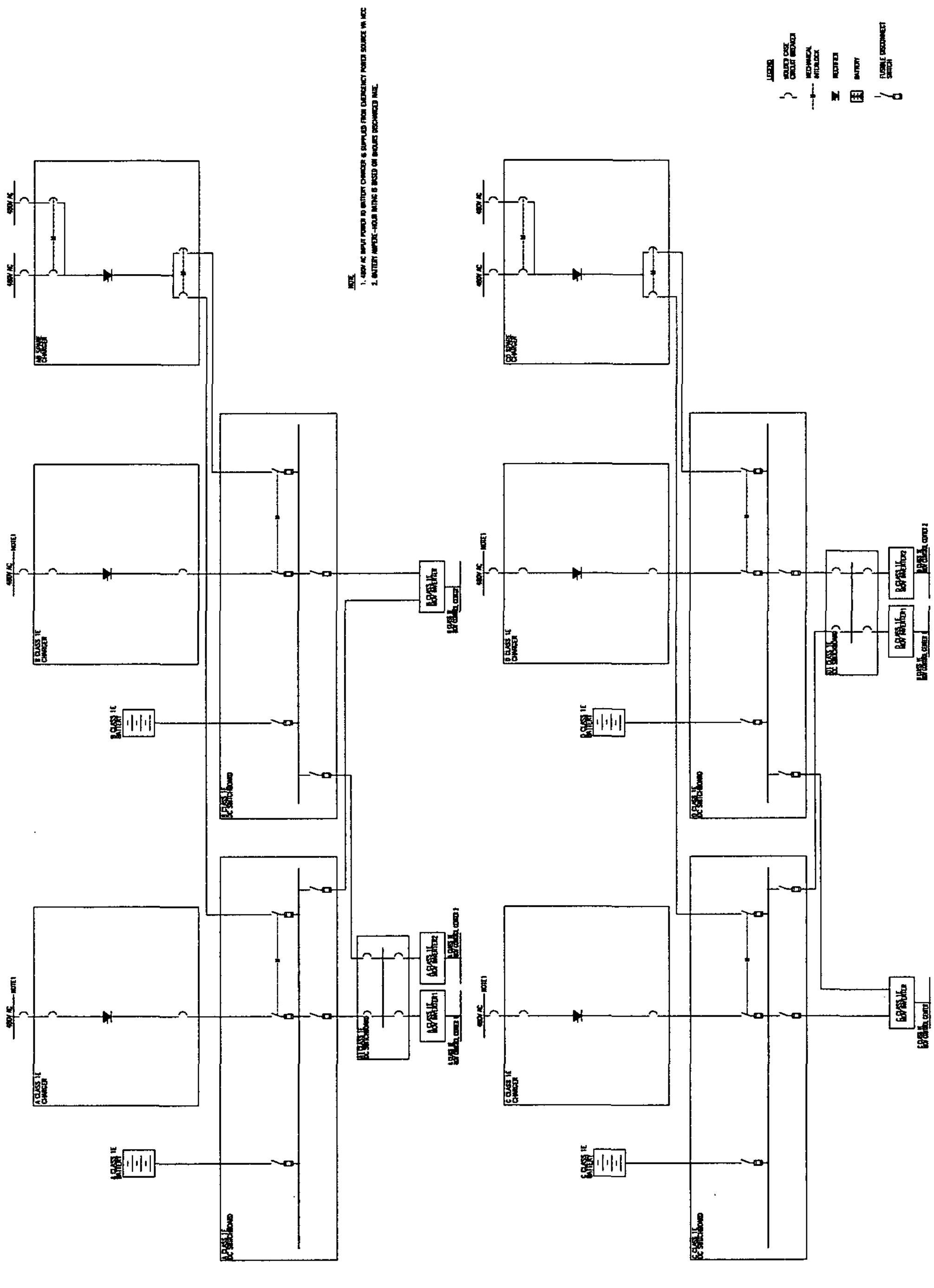

Figure 2.6.2-1 DC Power Systems

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.3

Item No.	Explanation/Basis for Change
Design Description 2.6.3	
A	New introductory paragraph added for consistency with other sections. Text is consistent with Tier 2, section 8.3.1.1.6.
B	MCR indications added to be consistent with DC ITAAC #14. Indications are described in Tier 2, Section 8.3.1.1.6.
C	Note 1
D	Note 2. See item L.
E	Note 1. Environmental qualification (EQ) of equipment addressed in individual system ITAAC. No EQ (i.e. harsh environment) requirements for equipment in Table 2.6.3-1 and no EQ ITAAC in Table 2.6.3-3.
F	First sentence was relocated (see item H) and revised per Note 1. Second sentence revised per Note 1. These changes alter the response to RAI 182, 14.03.06-6.
G	Deleted because it is redundant to Tier 1 section 2.12 and ITAAC in Table 2.12-1.
H	Notes 1 and 2. See item F.
I	Notes 1 and 2. See item P.
J	Note 1. This change does not impact the response to RAI 182, 14.03.06-11.
K	Note 1
L	Note 2. See item D.
M	Note 1
N	Note 1
O	Notes 1 and 2. See item R.
P	Notes 1 and 2. See item I.
Q	Note 1
R	Notes 1 and 2. See item O.
Table 2.6.3-1	
	No changes
Table 2.6.3-2	
	No changes
ITAAC Table 2.6.3-3	
1	Editorial changes.
2	2.i ITA – Editorial change. 2.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6, but does not impact the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
3	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
4	DC, ITA, AC – ITAAC deleted because it is redundant to ITAAC in Table 2.12-1 #10A.
5	No changes

Item No.	Explanation/Basis for Change
6	DC, ITA – Change made to convey the intent of the DC. Change does not impact the responses to RAI 182, 14.03.06-7 or RAI 193, 14.03.04-23. [RIS p5, Logic, sixth bullet]
7	DC, AC – The term "non-safety related" is replaced by "non-Class 1E" to make consistent with terminology used in Tier 2, Section 8.3. [RIS p3, Nomenclature, second bullet] ITA – Change to require more appropriate type test/analyses and verification method for isolation devices. [RIS p5, Logic, sixth bullet] 7.i AC – Change made to reference a report where "analysis" is specified in the ITA.[RIS p5, Logic, seventh bullet] – Change made to add acceptance criteria. [RIS p7, Consistency, second bullet] 7.ii AC – Change to provide consistency with revised ITA. [RIS p5, Logic, sixth bullet]
8	DC. ITA, AC – Change made to clarify intent of DC and provide consistency with Tier 2. This change alters the responses to RAI 182, 14.03.06-11 and RAI 182, 14.03.06-6. [RIS p7, Consistency, second bullet] AC – Change made to not reference a report where "analysis" is not specified in the ITA. This change alters the responses to RAI 182, 14.03.06-11 and RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
9	AC – Change made to not reference a report where "analysis" is not specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
10	DC, ITA, AC – ITAAC deleted because it is redundant to ITAAC #2.i and #2.ii in this table.
11	11.i: AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
12	No changes
13	DC, AC – Existing DC wording was confusing. Change made to provide consistency with the Design Description. Cable identification is addressed in ITAAC #12. [RIS p7, Consistency, third bullet]
14	DC, ITA, AC – Generic change to ITAAC for MCR indications for clarity and consistency. Change alters the response to RAI 182, 14.03.06-6. [RIS p7, Scope, first bullet]
15	DC, ITA, AC – New ITAAC added to address seismic qualification of raceway systems for Class 1E I&C power supply cables.

Figure 2.6.3-1

Item No.	Explanation/Basis for Change
	Changes noted on figure to show a bypass step down transformer for the alternate source. Change made to provide consistency to Tier 2.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.3 I&C Power Supply Systems

2.6.3.1 Design Description

The I&C power supply system has four independent Class 1E 120V ac I&C power supply trains A, B, C and D that supply four trains of the protection and reactor control systems. Each train consists of an uninterruptible power supply (UPS), a bypass transformer, a switching circuit and 120V ac distribution panels. The I&C power supply system is shown on Figure 2.6.3-1. Major components of this system are listed in Table 2.6.3-1. In addition to the displays and controls identified in Table 2.6.3-2, the following indications are provided in the main control room (MCR): A

- Output voltage and current of Class 1E UPS and transformer B
- Voltage of Class 1E I&C buses

1. The Ffunctional arrangement of the onsite I&C power supply systems is as described in the Design Description of Subsection 2.6.3.1 and as shown in are depicted on Figure 2.6.3-1. C

2. The Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design bases voltage at load terminals, considering derating due to ambient temperature and raceway loading. D

2.3. The All seismic Category I Class 1E I&C power supply system equipment identified in Table 2.6.3-1 can withstand seismic design basis loads without loss of safety function.are seismic Category I and qualified for postulated environmental conditions. The Table 2.6.3-1 shows electrical and seismic classification of major Class 1E I&C power supply system equipment. E

4. Deleted.

5. Independence is established between each of the four divisions of Class 1E I&C power supply distribution equipment. The equipment of each I&C power supply system division is located in a separate rooms in the reactor building. F

Areas containing Class 1E equipment are designated as vital areas and have controlled access. G

3.6. Independence is maintained between each of the four divisions of the Class 1E I&C power supply system distribution equipment and circuits, and between Class 1E I&C power supply system distribution equipment and circuits and non-Class 1E I&C power supply system distribution equipment and circuits. H

7. Independence is maintained between Class 1E I&C power supply system distribution equipment and non-Class 1E loads by Class 1E qualified isolation devices I

4.8. The power supply to each of the four Class 1E panel boards transfers from its Class 1E UPS unit to its Class 1E I&C power transformer automatically on an undervoltage signal on the output of its Class 1E UPS. J

5.9. When ac input power to the Class 1E UPS unit is lostWhen a LOOP occurs, input to the Class 1E UPS unit is provided by the Class 1E battery without interruption of power supply to the loads. K

10. Deleted.

The Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design bases voltage at load terminals, considering derating due to ambient temperature and raceway loading. L

6.11. The Class 1E I&C power supply system circuit breakers and fuses of the power supply system are rated adequately to interrupt the fault currents. M

12. The Eequipment and circuits of each Class 1E I&C power supply system division are uniquely identified. N

7.13. The Class 1E I&C power supply system cables are routed in raceway systems for Class 1E I&C power supply cables seismic Category I raceways within their respective division. O

Independence is maintained between Class 1E I&C power supply system distribution equipment and non safety-related I&C loads by Class 1E qualified isolation devices. P

8.14. Alarms and displays identified in Subsection 2.6.3.1 and Table 2.6.3-2 are provided in the MCRAlarms initiate in MCR to indicate Class 1E power supply system malfunctions and status conditions. System control and status display that are available in the MCR are shown on Table 2.6.3-2. Q

15. The raceway systems for Class 1E I&C power supply cables can withstand seismic design basis loads without loss of safety function. R

2.6.3.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.3-3 describes the ITAAC for the Class 1E I&C power supply systems.

Table 2.6.3-1 I&C Power Supply Systems Equipment Characteristics

Equipment Name	Seismic Category	Class 1E/Qual. for Harsh Environ.
A-Class 1E UPS Unit	I	Yes/No
B-Class 1E UPS Unit	I	Yes/No
C-Class 1E UPS Unit	I	Yes/No
D-Class 1E UPS Unit	I	Yes/No
A-Class 1E I&C Power Transformer	I	Yes/No
B-Class 1E I&C Power Transformer	I	Yes/No
C-Class 1E I&C Power Transformer	I	Yes/No
D-Class 1E I&C Power Transformer	I	Yes/No
A-Switching Circuit Panel	I	Yes/No
B-Switching Circuit Panel	I	Yes/No
C-Switching Circuit Panel	I	Yes/No
D-Switching Circuit Panel	I	Yes/No
A-Class 1E AC120V Panelboard	I	Yes/No
B-Class 1E AC120V Panelboard	I	Yes/No
C-Class 1E AC120V Panelboard	I	Yes/No
D-Class 1E AC120V Panelboard	I	Yes/No

Table 2.6.3-2 I&C Power Supply Systems Equipment Displays and Control Functions

Equipment Name	MCR Display	MCR Control Function
A-Class 1E UPS Unit	Yes	No
B-Class 1E UPS Unit	Yes	No
C-Class 1E UPS Unit	Yes	No
D-Class 1E UPS Unit	Yes	No
A-Class 1E I&C Power Transformer	Yes	No
B-Class 1E I&C Power Transformer	Yes	No
C-Class 1E I&C Power Transformer	Yes	No
D-Class 1E I&C Power Transformer	Yes	No
A-Switching Circuit Panel	Yes	No
B-Switching Circuit Panel	Yes	No
C-Switching Circuit Panel	Yes	No
D-Switching Circuit Panel	Yes	No
A-Class 1E AC120V Panelboard	Yes	No
B-Class 1E AC120V Panelboard	Yes	No
C-Class 1E AC120V Panelboard	Yes	No
D-Class 1E AC120V Panelboard	Yes	No

Table 2.6.3-3 I&C Power Supply Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the I&C power supply systems is as described in the Design Description of this Subsection 2.6.3.1 and is as shown inon Figure 2.6.3-1.	1. An inspection of the functional arrangement of the as-built I&C power supply systems will be performed.	1. The as-built I&C power supply systems conform to the functional arrangement described in the Design Description of this Subsection 2.6.3.1 and is-as shown in Figure 2.6.3-1.
2. The Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design bases voltage at load terminals, considering derating due to ambient temperature and raceway loading.	2.i An analysis will be performed to verify the Class 1E I&C power supply system equipment and cables are sized to carry the worst case load currents, to withstand the maximum fault currents, and to provide minimum design baseis voltage at load terminals for all modes of plant operation and accident conditions.	2.i A report exists and concludes that Tthe Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design bases voltage at load terminals, considering derating due to ambient temperature and raceway loading.
	2.ii An inspection will be performed to verify that the ratings of as-built Class 1E I&C power supply system equipment and cables bound the size requirements of the analysis.	2.ii The ratings of as-built Class 1E I&C power supply system equipment and cables bound the size requirements of the analysis.
3. The seismic Category IEach of the four divisions of Class 1E I&C power supply system equipment, identified in Table 2.6.3-1, canis designed to withstand seismic design basis loads without loss of safety function.	3.i. Inspections will be performed to verify that the seismic Category I as-built Class 1E I&C power supply system equipment identified in Table 2.6.3-1 is located in a seismic Category I structurethe reactor building.	3.i. The seismic Category I Each of the four divisions of as-built Class 1E I&C power supply system equipment identified in Table 2.6.3-1 is located in a seismic Category I structurethe reactor building.
	3.ii Type tests, analyses, or a combination of type test and and/or analyses of seismic Category I the Class 1E I&C power supply system equipment identified in Table 2.6.3-1 will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements..	3.ii A report exists and concludes that The results of the type tests and/or analyses conclude that the seismic Category I Class 1E I&C power supply system equipment identified in Table 2.6.3-1 can withstand seismic design basis loads without loss of safety function.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	3.iii Inspections and analyses An inspection will be performed to verify that on the as-built seismic Category I Class 1E I&C power supply system equipment identified in Table 2.6.3-1, including anchorages, is seismically bounded by the testing or analyzed conditions.	3.iii A report exists and concludes that Tthe as-built seismic Category I Class 1 E I&C power supply system equipment identified in Table 2.6.3-1, including anchorages, is seismically bounded by the tested or analyzed conditions.
4. The areas containing Class 1E I&C power supply system equipment are designated as vital areas and have controlled access. Deleted	4. An inspection of the as-built areas containing the as-built Class 1E I&C power supply system equipment will be performed. Deleted	4. The as-built areas containing the as-built Class 1E I&C power supply system equipment are designated as vital areas and have controlled access. Deleted

Table 2.6.3-3 I&C Power Supply Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5. The equipment of each Class 1E I&C power supply system division is located in separate rooms.	5. An inspection of each as-built Class 1E I&C power supply system division will be performed.	5. The equipment of each as-built Class 1E I&C power supply system division is located in separate rooms.
6. Independence is maintained between each of the four divisions of the Class 1E I&C power supply system distribution equipment and circuits, and between Class 1E I&C power supply system distribution equipment and circuits and non-Class 1E I&C power supply system distribution equipment and circuits.	6. Tests will be performed on the as-built Class 1E and non-Class 1E I&C power supply system distribution equipment and circuits by providing a test signal in only one division at a time.	6. The test signal exists in the as-built Class 1E division or non-Class 1E division under test.
7. Independence is maintained between Class 1E I&C power supply system distribution equipment and non-Class 1E safety-related loads by Class 1E qualified isolation devices.	7.i Type tests, analyses, or a combination of type tests and analyses will be performed to verify the qualification of isolation devices. 7.ii An iInspection will be performed of the as-built Class 1E I&C power supply system distribution equipment will be performed.	7.i A report exists and concludes that The as-built Class 1E I&C power supply system distribution equipment is isolated from the as-built non-Class 1E safety-related loads by the Class 1E qualified isolation devices so as to meet RG 1.75. 7.ii Independence between the as-built Class 1E I&C power supply system distribution equipment and the non-Class 1E loads is maintained by qualified isolation devices that are bounded by the type tests, analyses, or a combination of type tests and analyses.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. The power supply to each of the four Class 1E panel boards transfers from its Class 1E UPS unit to its Class 1E I&C power transformer automatically on an undervoltage signal on the output of its Class 1E UPS.	8. A test will be performed to verify that the power supply to each as-built Class 1E panel boardtransfers from its as-built Class 1E UPS unit to its as-built Class 1E I&C power transformer automatically on an undervoltage signal on the output of its Class 1E UPS.	8. The ~~results of the test conclude that the~~ power supply to each of the four as-built Class 1E panel boards transfers from its as-built Class 1E UPS unit to its as-built Class 1E I&C power transformer automatically on an undervoltage signal on the output of its Class 1E UPS.
9. When ac input power to the Class 1E UPS unit is lost, input to the Class 1E UPS unit is provided by the Class 1E battery without interruption of power supply to the loads.	9. A test will be performed to verify that when ac input power to the as-built Class 1E UPS unit is lost, input to the Class 1E UPS unit is provided by the Class 1E battery without interruption of power supply to the loads.	9. ~~The results of the test conclude that w~~When ac input power to the as-built Class 1E UPS unit is lost, input to the Class 1E UPS unit is provided by the Class 1E battery without interruption of power supply to the loads.

Table 2.6.3-3 I&C Power Supply Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. The Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading. Deleted	10. Type tests and/or analyses will be performed to verify that the Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading. Deleted	10. The results of type tests, and/or analyses conclude that the Class 1E I&C power supply system equipment and cables are sized to meet load requirements and provide minimum design basis voltage at load terminals considering derating due to ambient temperature and raceway loading. Deleted
11. The Class 1E I&C power supply system circuit breakers and fuses are rated adequately to interrupt the fault currents.	11.i An analysis will be performed to verify the Class 1E I&C power supply system breakers and fuses are rated adequately to interrupt the fault currents.	11.i A report exists and concludes that Tthe Class 1E I&C power supply system breakers and fuses are rated adequately to interrupt the fault currents.
	11.ii An inspection will be performed to verify the interrupting ratings of as-built Class 1E I&C power supply system breakers and fuses bound the requirements of the analysis.	11.ii The interrupting ratings of as-built Class 1E I&C power supply system breakers and fuses bound the requirements of the analysis.
12. The equipment and circuits of each Class 1E I&C power supply system division are uniquely identified.	12. An inspection of each as-built Class 1E I&C equipment and circuits of each Class 1E I&C power supply system division will be performed.	12. The equipment and circuits of each as-built Class 1E I&C power supply system division are uniquely identified.
13. The Class 1E I&C power supply system cables are routed in raceway systems for Class 1E I&C power supply cables within their respective division through seismic Category I structures and the cables and raceways are identified the same as their Class 1E division.	13. An inspection of the as-built Class 1E I&C power supply system cables routing will be performed.	13. The as-built Class 1E I&C power supply system cables are routed in raceway systems for Class 1E I&C power supply cables within their respective division through seismic Category I structures and the cables and raceways are identified the same as their Class 1E division.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14. Alarms and displays identified in Subsection 2.6.3.1 and Table 2.6.3-2 are provided in the MCR Alarms initiate in the MCR to indicate Class 1E I&C power supply system malfunctions and status conditions.	14. Inspection A test will be performed for retrievability of the alarms and displays identified in Subsection 2.6.3.1 and Table 2.6.3-2 in the MCRto verify that alarms initiate in the as-built MCR to indicate the as-built Class 1E I&C power supply system malfunctions and status conditions.	14. Alarms and displays identified in Subsection 2.6.3.1 and Table 2.6.3-2 can be retrieved in the as-built MCRThe results of the test conclude that alarms initiate in the as-built MCR to indicate the as-built Class 1E I&C power supply system malfunctions and status conditions.
15. The raceway systems for Class 1E I&C power supply cables can withstand seismic design basis loads without loss of safety function.	15.i Inspections will be performed to verify that the as-built raceway systems for Class 1E I&C power supply cables are supported by a seismic Category I structure(s). 15.ii Analyses of the raceway systems for Class 1E I&C power supply cables will be performed using analytical assumptions which bound the seismic design basis requirements. 15.iii. Inspection and analyses will be performed to verify that the as-built raceway systems for Class 1E I&C power supply cables are seismically bounded by the analyzed conditions.	15.i The as-built raceway systems for Class 1E I&C power supply cables are supported by a seismic Category I structure(s). 15.ii A report exists and concludes that the raceway systems for Class 1E I&C power supply cables can withstand seismic design basis loads without loss of safety function. 15.iii A report exists and concludes that the as-built raceway systems for Class 1E I&C power supply cables are seismically bounded by the analyzed conditions.

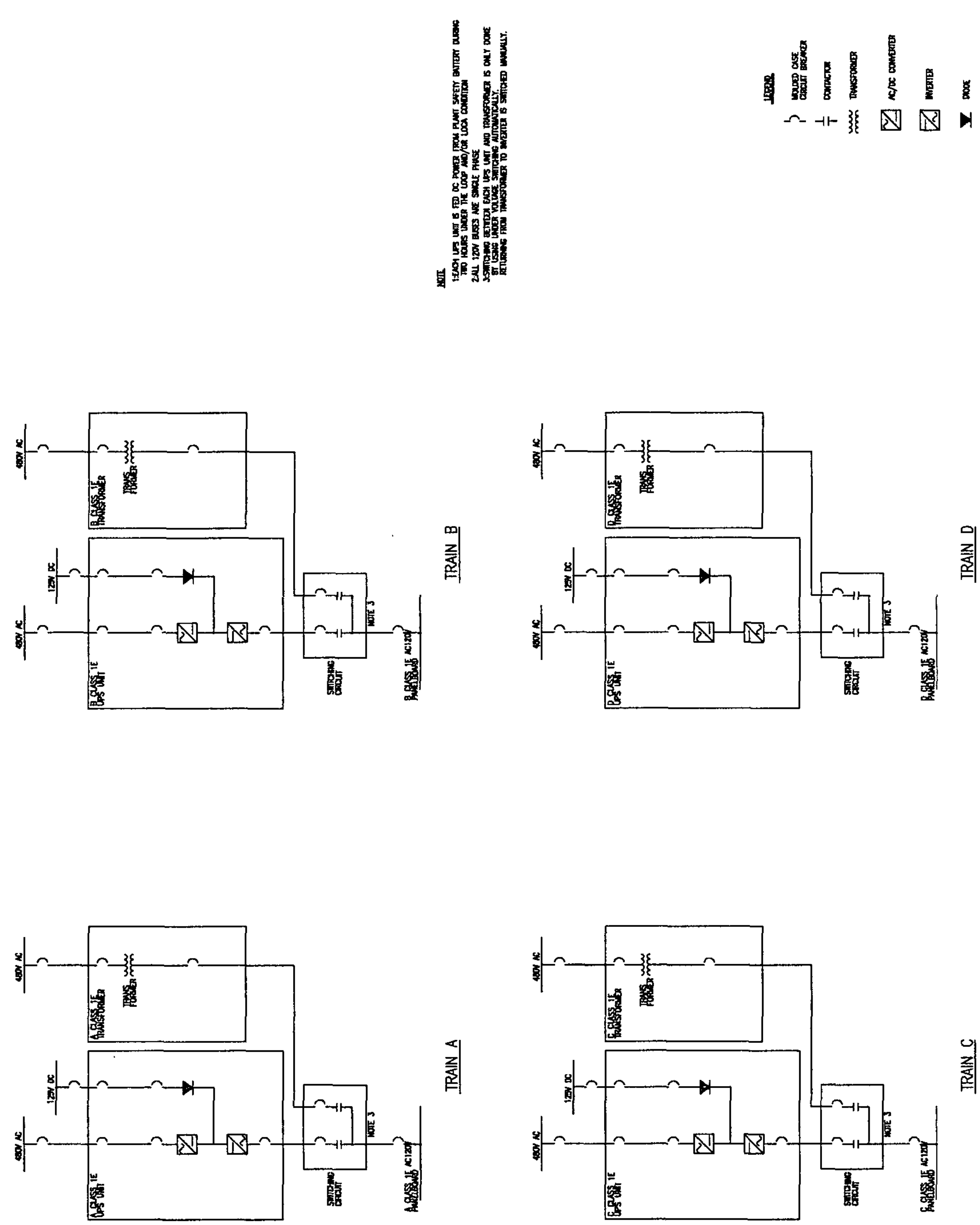

Figure 2.6.3-1 I&C Power Supply Systems

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.4

Item No.	Explanation/Basis for Change
Design Description 2.6.4	
A	New text added to provide consistency with corresponding DC.
B	New text added to provide consistency with corresponding DC.
C	Notes 1 and 2. See item X.
D	Notes 1 and 2. See item Y.
E	See ITAAC item #5.
F	Notes 1 and 2. See item J.
G	Notes 1 and 2. See items J, TT and LLL. This change alters the response to RAI 319, 09.05.06-1.
H	Notes 1 and 2. See items J, TT and LLL. This change alters the response to RAI 319, 09.05.06-1.
I	Notes 1 and 2. See items J, HH, TT, and LLL. This change alters the response to RAI 319, 09.05.06-1.
J	Notes 1 and 2. See items F, G, H, and I. This change alters the response to RAI 182, 14.03.06-6.
K	Note 1. This change alters the response to RAI 182, 14.03.06-6.
L	Notes 1 and 2. See items AA and KKK. This change alters the responses to RAI 182, 14.03.06-11 and RAI 319, 09.05.06-3.
M	Note 1.
N	Note 1.
O	Notes 1 and 2. See item Z. Separation with non-Class 1E systems is addressed in Table 2.6.1-3, ITAAC items #2 and #3.
P	Note 1. This change alters the response to RAI 182, 14.03.06-6.
Q	Note 1.
R	Note 1.
S	Note 1.
T	Note 1.
U	Note 1.
V	Note 1. This change does not impact the response to RAI 182, 14.03.06-6.
W	Notes 1 and 2. See items N and O. This change alters the response to RAI 182, 14.03.06-8.
X	Notes 1 and 2. See item D. This change alters the response to RAI 182, 14.03.06-8.
Y	Notes 1 and 2. See item E. This change alters the response to RAI 182, 14.03.06-8.
Z	Notes 1 and 2. See item O.
AA	Notes 1 and 2. See item L.
BB	Editorial change.
CC	Statement deleted because it was redundant to another Design Description. See item C. This change alters the response to RAI 182, 14.03.06-6.
DD	Statement deleted because it was too vague. Requirement verified through other Design Descriptions. This change alters the response to RAI 182, 14.03.06-6.
EE	Statement deleted because it was redundant to another Design Description. See item C.
FF	Notes 1 and 2. See item HHH.
GG	Notes 1 and 2. See item RR.
HH	Notes 1 and 2. See item I.
II	Revised to consolidate two related statements. See item UU.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.4

Item No.	Explanation/Basis for Change
JJ	Paragraph added to consolidate MCR alarm statements.
KK	Relocated to consolidate MCR alarm statements. See item WW. This change does not impact the response to RAI 182, 14.03.06-6.
LL	Relocated to consolidate MCR alarm statements. See item MMM. This change does not impact the response to RAI 319, 09.05.06-1.
MM	Relocated to consolidate MCR alarm statements. See item PPP. This change does not impact the response to RAI 320, 09.05.07-1.
NN	Relocated to introduction section and revised to incorporate the response to RAI 505, 09.05.08-25, although the text is altered from that provided in this RAI response. See item RRR.
OO	Note 1.
PP	See ITAAC item #20.
QQ	Notes 1 and 2. See item VV. This change alters the response to RAI 318, 09.05.04-38.
RR	Notes 1 and 2. See item HH
SS	Note 1.
TT	Notes 1 and 2. See items G, H, I, ZZ, AAA, BBB, CCC, DDD, and EEE. Material of components does not need to be specified in Tier 1.
UU	Revised to consolidate two related statements. See item II.
VV	Notes 1 and 2. See item QQ.
WW	Relocated to consolidate MCR alarm statements. See item KK.
XX	Note 1.
YY	Note 1. The sentence regarding separation was deleted because it is redundant to ITAAC 2.6.1-3, items #2, #3, and #4.
ZZ	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
AAA	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
BBB	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
CCC	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
DDD	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
EEE	Notes 1 and 2. See item TT. This change alters the response to RAI 319, 09.05.06-1.
FFF	See ITAAC item #28.
GGG	See ITAAC item #28. This change alters the response to RAI 318, 09.05.04-37.
HHH	Notes 1 and 2. See item FF.
III	Note 2. See item KKK. This change does not impact the response to RAI 320, 09.05.07-1.
JJJ	Notes 1 and 2. See item OOO. This change does not impact the response to RAI 320, 09.05.07-1.
KKK	Notes 1 and 2. See item L.
LLL	Notes 1 and 2. See items G, H, I, ZZ, AAA, BBB, CCC, DDD, and EEE. This change alters the response to RAI 319, 09.05.06-1.
MMM	Relocated to consolidate MCR alarm statements. See item LL.
NNN	Notes 1 and 2. See item III.
OOO	Notes 1 and 2. See item JJJ.
PPP	Relocated to consolidate MCR alarm statements. See item MM.
QQQ	Note 1. This change alters the responses to RAI 321, 09.05.08-16 and RAI 505. 09.05.08-25.

Item No.	Explanation/Basis for Change
RRR	Relocated to introduction section. See item NN. This change does not impact the response to RAI 321, 09.05.08-16.
ITAAC Table 2.6.4-1	
1	DC, AC – Editorial.
2	DC, AC – Revised so that the text was in the form of a design commitment. This change alters the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, second bullet]
3	DC, ITA – Clarification.
4	No changes
5	No changes
6.	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
7.a	DC, ITA, AC – Generic changes made to ASME ITAAC to provide clarity and consistency. New Table 2.6.4-2 added to list the support system components and piping that are ASME Code Section III. This change alters the response to RAI 182, 14.03.06-6 and RAI 242, 14.03.03-14. [RIS p5, Logic, seventh bullet and p7, Consistency, second bullet]
7.b	DC, ITA, AC – Generic changes made to ASME ITAAC to provide clarity and consistency. New Table 2.6.4-2 added to list the support system components and piping that are ASME Code Section III. This change alters the response to RAI 242, 14.03.03-14. [RIS p5, Logic, seventh bullet and p7, Consistency, second bullet]
8.a, 8.b	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. New Table 2.6.4-2 added to provide a list of support system components that are seismic Category I. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
9	DC, ITA, AC – Revised to clarify the scope of DC. This change does not impact the response to RAI 182, 14.03.06-10. [RIS p7, Consistency, second bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
10	DC – Clarify DC text. This change does not impact the response to RAI 319, 09.05.06-3. [RIS p7, Consistency, second bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
11	DC, AC – Editorial change

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.4

Item No.	Explanation/Basis for Change
12.a	ITA, AC – For electrical independence, the ITA and AC were changed to require a test versus an inspection. The physical separation aspect was relocated to a new ITAAC, item 12.b. [RIS p5, Logic, sixth bullet]
12.b	DC, ITA, AC – New ITAAC to address physical separation. [RIS p7, Scope, first bullet]
13	DC, ITA – Clarify DC and ITA. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, third bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
14.a	DC, ITA – Revised to make consistent with Tier 2 description. Tier 2 section 8.3.1 states that the Class 1E standby power sources start on an ECCS signal; a LOOP concurrent with LOCA is not needed. [RIS p7, Consistency, fourth bullet] ITA, AC – Revised to specify that a "simulated" signal will be used. [RIS p5, Logic, seventh bullet] AC – Provide consistent wording in AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
14.b	ITA – Revised to verify intent of DC. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, second bullet] AC – Provide consistent wording in AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
14.c	DC, ITA, AC – Clarify scope of DC. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, third bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
15.a	AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
15.b	AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.4

Item No.	Explanation/Basis for Change
16	DC, ITA, AC – Revised to clarify intent of DC. The term "severe failure protection" is not defined in Tier 2. Tier 2, Section 8.3.1.1.3.3 lists the protection functions that are not bypassed. This change alters the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, fourth bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
17	ITA – Revised to verify intent of DC. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, second bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
18	DC, ITA, AC – Generic changes to ITAAC for MCR controls to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
19	DC, ITA, AC – Added Class IE EPS ventilation/cooling air intake and exhaust system to the functional arrangement ITAAC. – Other editorial changes.
20	DC, ITA, AC – ITAAC deleted because it is redundant to items 8 (seismic requirements for support systems) and 7 and 26 (ASME requirements for support systems).
21	ITA, AC – Revised to require "analyses", a "test", and "inspections and analysis" versus a "test" and an "inspection." Since the required flow rate is not known, an analysis is required to determine. In addition, the verification of NPSH available is separately described in a ITA and AC from that of flow rate. Also revised to make consistent with intent of DC. This change alters the response to RAI 318, 09.05.04-38. [RIS p5, Logic, sixth bullet] – Reword from GTG to EPS for consistency. AC – Provide consistent wording in the AC. This change alters the response to RAI 318, 09.05.04-38. [RIS p5, Logic, seventh bullet]
22	DC, ITA, AC – Revised to add "at rated load" to verify intent of DC. This change alters the response to RAI 318, 09.05.04-40. [RIS p7, Consistency, third bullet] ITA, AC – Added requirement to perform an analysis since the required capacity of the tank is not known. This change alters the response to RAI 318, 09.05.04-40. [RIS p5, Logic, sixth bullet]
23	DC, ITA, AC – Generic changes to ITAAC for MCR indications to provide clarity and consistency. This change alters the responses to RAI 182, 14.03.06-6 and RAI 319, 09.05.06-4. [RIS p5, Logic, seventh bullet]

Item No.	Explanation/Basis for Change
24	DC, AC – Revised text to be in the form of a design commitment. [RIS p7, Consistency, third bullet] AC – Provide consistent wording in the AC. This change alters the response to RAI 182, 14.03.06-6. [RIS p5, Logic, seventh bullet]
25	No changes
26	DC, ITA, AC – Generic changes made to ASME ITAAC to provide clarity and consistency. New Table 2.6.4-2 added to list the support system components and piping that are ASME Code Section III. This change alters the responses to RAI 242, 14.03.03-5, RAI 404, 14.03.03-20, RAI 242, 14.03.03-6, RAI 404, 14.03.03-21. [RIS p5, Logic, seventh bullet and p7, Consistency, second bullet]
27	DC, ITA, AC – Generic changes made to ASME ITAAC to provide clarity and consistency. New Table 2.6.4-2 added to list the support system components and piping that are ASME Code Section III. This change alters the response to RAI 242, 14.03.03-8. [RIS p5, Logic, seventh bullet and p7, Consistency, second bullet]
28	DC, ITA, AC – ITAAC deleted because it was not appropriate for an ITAAC per the SRP 14.3 and 14.3.6. The concept addressed in this ITAAC was programmatic in nature. No similar ITAAC identified in other current DCDs. Implementation would be extremely difficult due to the subjective nature of the AC. This change alters the response to RAI 318, 09.05.04-37.
29	DC, ITA, AC – Revised to add "at rated load" to verify intent of DC. This change alters the response to RAI 318, 09.05.04-40. [RIS p7, Consistency, third bullet] ITA, AC – Added requirement to perform an analysis since the required capacity of the tank is not known. This change alters the response to RAI 318, 09.05.04-40. [RIS p5, Logic, sixth bullet]
30	ITA, AC – Added requirement to perform an analysis since the required capacity of the tank is not known. This change alters the response to RAI 320, 09.05.07-1. [RIS p5, Logic, sixth bullet]
31	No changes
32	DC, ITA, AC – Existing wording was too subjective. Revised to provide clarity. [RIS p7, Consistency, third bullet] – Reword from GTG to EPS for consistency.
Table 2.6.4-2	
	New table added to provide a list of EPS support system components and piping that are seismic Category I and ASME Code Section III.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.4 Emergency Power Sources (EPS)

2.6.4.1 EPS Design Description

The emergency power supply to each of the four divisions of the Class 1E power distribution systems is provided by a Class 1E EPS. The Class 1E EPSs are normally in standby mode and provide power to the Class 1E 6.9kV buses upon loss of offsite power sources.

1. The functional arrangement of the Class 1E EPS is as described in the Design Description of Subsection 2.6.4.1. A

2. Each Class 1E EPS can, when starting from the standby mode, provide power to the Class 1E 6.9kV buses upon loss of offsite power sources. B

3. Each of the four Class 1E EPSs has its own fuel oil storage and transfer, lubrication, starting, and combustion air intake and exhaust systems. C

4. The auxiliary power for each Class 1E EPS support system is provided by the same division of the Class 1E power system. D

5. Deleted. E

6. The four seismic Category I Class 1E EPSs can withstand seismic design basis loads without loss of safety function. F

7.a The ASME Code Section III components of the Class 1E EPS support systems, identified in Table 2.6.4-2, retain their pressure boundary integrity at their design pressure. G

7.b The ASME Code Section III piping of the Class 1E EPS support systems, identified in Table 2.6.4-2, retains its pressure boundary integrity at its design pressure. H

8.a The seismic Category I equipment of the Class 1E EPS support systems, identified in Table 2.6.4-2, can withstand seismic design basis loads without loss of safety function. I

8.b The seismic Category I piping, including supports, identified in Table 2.6.4-2 can withstand seismic design basis loads without a loss of its safety function.

~~Each Class 1E EPS and its associated equipment are Class 1E and are classified seismic Category I. The support systems that are required for the Class 1E EPS to perform the safety functions of starting and operating the Class 1E EPS are classified ASME Code Section III, Class 3. The Class 1E EPS and the ASME Code Section III, Class 3 portion of the support systems are seismic Category I.~~ J

9. Each ~~The~~ Class 1E EPS~~s are~~ is sized to provide power to its division's safety-related loads subsequent to a LOOP or a LOOP ~~and~~ concurrent with LOCA conditions. K

10. The stored air starting system is capable of starting the Class 1E EPS without requiring replenishment. L

11. The Class 1E EPS engine combustion air intake ~~combustion air~~ is separated from the engine exhaust. M

12.a Independence is maintained between each of the four Class 1E EPSs ~~Mechanical and electrical systems are designed so that a single failure affects the operation of only one Class 1E EPS~~. N

12.b The Class 1E EPSs are located in separate rooms in the PS/B~~Separation criteria are applied among any redundant Class 1E EPS and between any Class 1E EPS and non-Class 1E systems~~. O

13. Each ~~The~~ Class 1E EPS~~s are~~ is capable of providing power at the~~a~~ set voltage and frequency to its ~~the~~ Class 1E 6.9kV bus~~es~~ within 100 seconds of receiving~~from~~ a start signal. P

14.a The ECCS actuation signal starts the Class 1E EPSs ~~and sheds the non-accident loads connected to the Class 1E buses~~. Q

14.b Each ~~The~~ Class 1E EPS circuit breaker automatically closes and loads are shed if its respective division Class 1E medium voltage bus is~~if the buses are~~ de-energized. R

14.c After the Class 1E EPS circuit breaker closes, the safety-related ~~accident~~ loads on the same division Class 1E buses are started in sequence by the ECCS load sequencer. S

15.a A loss of power to a Class 1E bus initiates an automatic start of the respective Class 1E EPS, load shedding of connected loads, and closing of the Class 1E EPS circuit breaker.

15.b After the closing of the Class 1E EPS circuit breaker, the LOOP sequencer sequentially starts the required safety-related~~non-accident~~ loads. T

16. All Class 1E EPS protection systems, except for overspeed, generator differential current, and high exhaust gas temperature~~severe failure protection~~, are bypassed when the Class 1E EPS is started by an ECCS actuation signal. U

17. The Class 1E EPSs are capable of responding to an automatic start ~~ECCS actuation~~ signal when running for test purposes. V

18. Controls are provided in~~Each Class 1E EPS can be controlled from~~ the MCR and ~~from~~ the Class 1E EPS room to start and stop each Class 1E EPS. W

~~Independence is established between each of the four Class 1E EPSs and its associated distribution equipment.~~ W

~~Each Class 1E EPS has its own fuel oil storage and transfer, lubrication, starting, and air intake and exhaust systems.~~ X

~~Auxiliary power for Class 1E EPS support systems is provided by the same division of the Class 1E power system.~~ Y

~~Each Class 1E EPS is located in a separate room in the PS/B.~~ Z

~~The stored air starting system is capable of providing starting air to each of the four Class 1E EPSs without requiring replenishment~~. AA

2.6.4.2 EPS Support Systems Design Description

Each Class 1E EPS is provided with a dedicated and independent fuel oil supply system~~s~~, fuel oil day tank and storage tank such that: BB

- The FOS are safety-related systems.
- ~~The FOS are not shared between the Class 1E EPSs of redundant divisions.~~ CC
- ~~The FOS are designed to minimize common cause failure of Class 1E EPSs of redundant divisions~~. DD

~~The FOS design features include:~~

- ~~Four redundant and independent divisions, each dedicated to its respective Class 1E EPS.~~ EE
- ~~Each fuel oil storage tank provides a seven day supply of fuel oil to its respective Class 1E EPS.~~ FF
- ~~Each fuel oil day tank provides sufficient fuel for 1.5 hours of Class 1E EPS operation and is elevated above its Class 1E EPS to provide gravity flow~~. GG
- The FOS is designed so that a single failure of any active component of the system cannot affect the ability of the system to store and deliver fuel oil.
- ~~The system is designed to remain operational during and after a safe-shutdown earthquake~~. HH
- The system contents are protected from the effects of low temperatures.
- Each fuel oil day tank is located inside the associated Class 1E EPS room in the seismic Category I building.
- Two skid mounted transfer pumps serve each Class 1E EPS to transfer fuel oil from the fuel oil storage tank to the Class 1E EPS fuel oil day tank. II

The following EPS support system alarms are provided in the MCR: JJ

- Low fuel oil level in the fuel oil storage tanks, and low and high level in the fuel oil day tanks. KK
- Low pressure in the air receivers. LL

- Low pressure and high temperature of the lubrication oil system. MM

The Class IE EPS ventilation/cooling air intake and exhaust system provides cooling for EPS operation. The Class 1E EPS turbine intake and exhaust and ventilation/cooling air intake and exhaust openings are above the roof of the power source buildings (PS/B), and the portion of the piping/ducts above the roof is protected by a guard structure against precipitation and tornado missiles. NN

19. The functional arrangement of the Class 1E EPS fuel oil storage and transfer system and the Class 1E EPS ventilation/cooling air intake and exhaust system are as described in the Design Description of Subsection 2.6.4.2. OO

20. Deleted. PP

21. Each fuel oil transfer pump transfers fuel oil from the fuel oil storage tank to the Class 1E EPS day tank at a flow rate to support Class 1E EPS operation at continuous rated load while simultaneously increasing day tank level. Sufficient transfer pump NPSH is maintained under all design conditions. QQ

22. Each Class 1E EPS FOS day tank capacity is sufficient to provide fuel oil for 1.5 hours of EPS operation at rated load. The fuel oil in each fuel oil day tank flows by gravity to maintain positive pressure at the fuel pumps for each Class 1E EPS. RR

23. Alarms identified in Subsection 2.6.4.2 are provided in the MCR. SS

~~The FOS and the related tank and pump compartments are designed to seismic Category I standards. The system is designed to meet the requirements of the ASME Code, Section III. The tanks and the related piping and valves are made of carbon steel, which is painted for corrosion resistance.~~ TT

~~One of the two pumps transfers fuel oil from the fuel oil storage tank to the Class 1E EPS fuel oil day tank~~. UU

~~Each transfer pump is capable of supporting EPS operation at continuous rated load while simultaneously increasing day tank level. Sufficient transfer pump NPSH is maintained under all design conditions. Fuel oil in the fuel oil day tank flows by gravity to feed the Class 1E EPS.~~ VV

~~Alarms are provided in the MCR for low fuel oil level in the fuel oil storage tanks and low and high level in the fuel oil day tanks.~~ WW

~~19.~~24. The ~~System logic involves the~~ fuel oil transfer pump starts~~ing~~ automatically on a fuel oil day tank low level signal and stops~~ping~~ automatically on a fuel oil day tank high-level signal. ~~There are no system interlocks.~~ XX

~~20.~~25. The ~~Each~~ fuel oil transfer pumps are ~~is~~ powered from their~~its~~ respective Class 1E division. ~~Separation is provided between Class 1E divisions and between Class 1E divisions and the non-Class 1E division.~~ YY

26.a.i The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements. ZZ

26.a.ii The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are reconciled with the design requirements. AAA

26.b.i The ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2, is fabricated, installed, and inspected in accordance with ASME Code Section III requirements. BBB

26.b.ii The ASME Code Section III piping of the of the EPS support systems, including supports, identified in Table 2.6.4-2, is reconciled with the design requirements. CCC

27.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds. DDD

27.b Pressure boundary welds in ASME Code Section III piping, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds EEE

28. Deleted. FFF

If a safety-related mechanical component in the EPS support systems is not designed to ASME Code Section III, then quality of the component is demonstrated and documented (e.g. seismic design, testing and qualification). GGG

29. Each fuel oil storage tank provides a seven day supply of fuel oil to its respective Class 1E EPS while operating at rated load. HHH

30. Each lubrication oil tank provides a seven day supply of lubrication oil to its respective Class 1E EPS. III

31. Each main shaft driven lubrication oil pump circulates lubrication oil to the engine during EPS operation. JJJ

The stored air starting system is capable of providing starting air to each of the four Class 1E EPSs without requiring replenishment. KKK

The safety-related portions of starting air system components are designed to seismic Category I standards. These portions are designed to meet the requirements of the ASME Code. Section III. LLL

Alarms are provided in the MCR for low pressure in air receivers. MMM

Each lubrication oil tank provides a seven day supply of lube oil to its respective Class 1E EPS. NNN

Lubrication oil is circulated by main shaft driven pump during EPS operation. OOO

Alarms are provided in the MCR for low pressure and high temperature of lubrication oil system. PPP

28.32. Each division of tThe Class 1E EPS GTG combustion air intake and exhaust system is capable of supplying an adequate quantity of combustion air to the GT EPS and of disposing the exhaust gases of the EPS without creating an excessive backpressure on the GT when operating at 110% of nameplate rating. The turbine intake and exhaust openings are above the roof of the power source buildings (PS/B), and the portion of the piping/ducts above the roof is protected by a guard structure against precipitation and tornado missiles. QQQ RRR

2.6.4.3 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.4-1 describes the ITAAC for the Class 1E EPS and the FOS systems.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the Class 1E EPS is as described in the Design Description ofthis Subsection 2.6.4.1	1. An inspection of the functional arrangement of the as-built Class 1E EPS will be performed.	1. The as-built onsite Class 1E EPS conforms to the functional arrangement as described in the Design Description ofthis Subsection 2.6.4.1
2. Each Class 1E EPS can, when starting from the standby mode, is normally in standby mode and provides power to the Class 1E 6.9kV buses upon loss of offsite power sources.	2. A test of each as-built Class 1E EPS will be performed.	2. The results of the test conclude that eEach as-built Class 1E EPS can, when starting from the standby mode, is normally in standby mode and provides power to the as-built Class 1E 6.9kV buses upon loss of offsite power sources.
3. Each of the four Class 1E EPS has its own fuel oil storage and transfer, lubrication, starting, and combustion air intake and exhaust systems.	3. An inspection of each as-built Class 1E EPS and support systems will be performed.	3. Each of the four as-built Class 1E EPS has its own fuel oil storage and transfer, lubrication, starting, and combustion air intake and exhaust systems.
4. The auxiliary power for each Class 1E EPS' support system is provided by the same division of the Class 1E power system.	4.i An inspection of each as-built Class 1E EPS' support system will be performed.	4.i The auxiliary power for each as-built Class 1E EPS' support system is provided by same division of the Class 1E power system.
	4.ii A test of each as-built Class 1E EPS' support system will be performed to verify that auxiliary power is provided by the same division of the Class 1E power system.	4.ii The auxiliary power for each as-built Class 1E EPS' support system is provided by the same division of the Class 1E power system.
5. Deleted.	5. Deleted.	5. Deleted.
6. The four seismic Category I Each of the four Class 1E EPSs canare designed to withstand seismic design basis loads without loss of safety function.	6.i Inspections will be performed to verify that each seismic Category I each as-built Class 1E EPS is located in a seismic Category I structurethe PS/B.	6.i Each of the four seismic Category I as-built Class 1E EPSs is located in a seismic Category I structurethe PS/B.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	6.ii Type tests, analyses or a combination of type tests and and/or analyses of the foureach seismic Category I Class 1E EPSs will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements..	6.ii A report exists and concludes The results of the type tests and/or analyses conclude that each of the four seismic Category I as-built Class 1E EPSs can withstand seismic design basis loads without loss of safety function.
	6.iii Inspections and analyses An inspection will be performed to verify that on each as-built seismic Category I Class 1E EPS, including anchorages, is seismically bounded by the tested or analyzed conditions.	6.iii A report exists and concludes that Eeach of the four as-built seismic Category I Class 1E EPSs, including anchorages, is seismically bounded by the tested or analyzed conditions.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.a The ASME Code Section III components of the Class 1E EPS support systems, identified in Table 2.6.4-2, ~~for support systems that are required to support safety functions of starting and operating the Class 1E EPS,~~ retain their pressure boundary integrity at their design pressure.	7.a A ~~H~~hydrostatic test~~s~~ will be performed on the as-built components identified in Table 2.6.4-2~~of the support systems~~ required by the ASME Code Section III to be hydrostatically tested.	7.a ASME Code Data Report(s) exists and conclude that ~~T~~the results of the hydrostatic test~~s~~ of the as-built components of the Class 1E EPS support systems, identified in Table 2.6.4-2 as ASME Code Section III ~~components for support systems that are required to support safety functions of starting and operating the Class 1E EPS~~ conform with the requirements of ASME Code Section III.
7.b The ASME Code Section III piping of the Class 1E EPS support systems, identified in Table 2.6.4-2~~for support systems that are required to support the safety functions of starting and operating the Class 1E EPS~~, retains its~~their~~ pressure boundary integrity at its~~their~~ design pressure.	7.b A ~~H~~hydrostatic test~~s~~ will be performed on the ~~ASME Code Section III portions of the~~ as-built piping, identified in Table 2.6.4-2, ~~of the support systems~~ required by the ASME Code Section III to be hydrostatically tested.	7.b ASME Code Data Report(s) exists and conclude that ~~T~~the results of the hydrostatic tests of the as-built ~~ASME Code Section III~~ piping of the Class 1E EPS support systems, identified in Table 2.6.4-2, as ASME Code Section III~~for support systems that are required to support the safety functions of starting and operating the Class 1E EPS~~ conform to~~with~~ the requirements of ASME Code Section III.
8.a The seismic Category I~~ASME Code Section III Class 3~~ equipment of the Class 1E EPS support systems, identified in Table 2.6.4-2~~portions of the EPS support systems~~ can~~are designed to~~ withstand seismic design basis loads without loss of safety function.	8.a.i Inspections will be performed to verify that the seismic Category I~~ASME Code Section III Class 3~~ equipment identified in Table 2.6.4-2 is~~portions of the EPS support systems are~~ located in a~~within~~ seismic Category I structure~~s~~.	8.a.i ~~Each of t~~The as-built seismic Category I~~ASME Code Section III, Class 3~~ equipment of the Class 1E EPS support systems, identified in Table 2.6.4-2, ~~portions of the EPS support systems~~ is located in a~~within~~ seismic Category I structure~~s~~.
	8.a.ii Type tests, analyses, or a combination of type tests and ~~and/or~~ analyses of the seismic Category I equipment identified in Table 2.6.4-2~~ASME Code Section III Class 3 portion of the EPS support systems~~ will be	8.a.ii A report exists and concludes that the seismic Category I equipment of the Class 1E EPS support systems, identified in Table 2.6.4-2 ~~The results of the type tests and/or analyses conclude that~~

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	each of as-built ASME Code Section III, Class 3 portions of the EPS support systems can withstand seismic design basis loads without loss of safety function.
	8.a.iii Inspections and analyses An inspection will be performed to verify that the as-built seismic Category I equipment identified in Table 2.6.4-2on the ASME Code Section III Class 3 portion of the EPS support systems, including anchorages, is seismically bounded by the tested or analyzed conditions.	8.a.iii A report exists and concludes that Each of the as-built seismic Category I equipment identified in Table 2.6.4-2.ASME Code Section III, Class 3 portions of the EPS support systems, including anchorages, is seismically bounded by the tested or analyzed conditions.
8.b The seismic Category I piping, including supports, identified in Table 2.6.4-2 can withstand seismic design basis loads without a loss of its safety function.	8.b.i Inspections will be performed to verify that the as-built seismic Category I piping, including supports, identified in Table 2.6.4-2 is supported by a seismic Category I structure(s).	8.b.i The as-built seismic Category I piping, including supports, identified in Table 2.6.4-2 is supported by a seismic Category I structure(s).
	8.b.ii Inspections and analyses will be performed to verify that the as-built seismic Category I piping, including supports, identified in Table 2.6.4-2 can withstand seismic design basis loads without a loss of its safety function.	8.b.ii A report exists and concludes that the as-built seismic Category I piping, including supports, identified in Table 2.6.4-2 can withstand seismic design basis loads without a loss of its safety function.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
9. EachThe Class 1E EPSs are is sized to provide power to its division's safety-related loads subsequent to a LOOP or a LOOP concurrent with LOCA conditions.	9.i An analysis will be performed to verify that eachthe Class 1E EPSs are is capable of providing power to its division's safety-related loads subsequent to a LOOP or a LOOP concurrent with LOCA conditions.	9.i A report exists and concludes that each The Class 1E EPSs are is sized to provide power to its division's safety- related loads subsequent to a LOOP or a LOOP concurrent with LOCA conditions.
	9.ii An inspection will be performed to verify that the ratings of each as-built Class 1E EPSs bounds the size requirements of the analysis.	9.ii The ratings of theeach as-built Class 1E EPSs bounds the size requirements of the analysis.
10. The stored air starting system is capable of startingproviding start of the Class 1E EPS without requiring replenishment.	10. A test of the as-built Class 1E EPS starting system will be performed.	10. The results of the test conclude that the as-built Class 1E EPS stored air starting system is capable of providing three starts of the as-built Class 1E EPS without requiring replenishment.
11. The Class 1E EPS engine combustion air intake portion is separated from the engine exhaust portion.	11. An inspection of the as-built Class 1E EPS engine will be performed.	11. The as-built Class 1E EPS engine combustion air intake portion is separated from the as-built engine exhaust portion.
12.a Independence is maintained between each of the four Class 1E EPSs.	12.a Test will be performed on the as-built Class 1E EPSs by providing a test signal in only one division at a timeAn inspection of the as-built Class 1E EPSs will be performed.	12.a The test signal exists in the as-built Class 1E EPS division under testThe as-built Class 1E EPSs are isolated each other.
12.b The Class 1E EPSs are located in separate rooms in the PS/B.	12.b An inspection of the as-built Class 1E EPSs will be performed	12.b The as-built Class 1E EPSs are located in separate rooms in the PS/B.
13. EachThe Class 1E EPS are is capable of providing power at the set voltage and frequency to itsthe Class 1E 6.9kV buses within 100 seconds of receiving a start signal.	13. A test will be performed to verify that eachthe as-built Class 1E EPS power sources can reach set voltage and frequency within 100 seconds of receiving a start signal.	13. The results of the test conclude that tThe as-built Class 1E EPS power reaches the set voltage and frequency within 100 seconds of receiving a start signal.

14.a The ECCS actuation signal starts the Class 1E EPSs ~~under a LOOP concurrent with LOCA conditions~~.	14.a A test will be performed to verify that the simulated ECCS actuation signal starts the as-built Class 1E EPSs ~~under a simulated LOOP concurrent with LOCA conditions~~.	14.a ~~The results of the test conclude that t~~The simulated ECCS actuation signal starts the as-built Class 1E EPSs.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 4 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14.b Each Class 1E EPS circuit breaker automatically closes and loads are shed if its respective division Class 1E medium voltage bus is de-energized.	14.b A test will be performed to verify operation of each as-built Class 1E EPS circuit breaker and shedding of loads.	14.b ~~The results of the test conclude that e~~Each as-built Class 1E EPS circuit breaker automatically closes and loads are shed if its respective division Class 1E medium voltage bus is de-energized.
14.c After the Class 1E EPS circuit breaker closes, the safety-related loads on the same division Class 1E buses are started in sequence by the ECCS load sequencer.	14.c A test will be performed to verify operation that after the Class 1E EPS circuit breaker closes, the as-built safety-related loads on the same division Class 1E buses are started in sequence by the ECCS load sequencer.	14.c ~~The results of the test conclude that a~~After the Class 1E EPS circuit breaker closes, the as-built safety-related loads on the same division Class 1E buses are started in sequence by the ECCS load sequencer.
15.a A loss of power to a Class1E bus initiates an automatic start of the respective Class 1E EPS, load shedding of connected loads, and closing of the Class 1E EPS circuit breaker.	15.a A test will be performed to verify operation of the respective Class 1E EPS upon a loss of power to the as-built Class 1E bus.	15.a ~~The results of the test conclude that a~~A loss of power to the as-built Class 1E bus initiates an automatic start of the respective as-built Class 1E EPS, load shedding of connected loads, and closing of the as-built Class 1E EPS circuit breaker.
15.b After the closing of the Class 1E EPS circuit breaker, the LOOP sequencer sequentially starts the required safety-related loads.	15.b A test will be performed to verify operation of the LOOP sequencer after the closing of the as-built Class 1E EPS circuit breaker.	15.b ~~The results of the test conclude that a~~After the closing of the as-built Class 1E EPS circuit breaker, the LOOP sequencer sequentially starts the required safety-related loads.
16. All Class 1E EPS protection systems, except for overspeed, generator differential current, and high exhaust gas temperature~~severe failure protection~~, are bypassed when the Class 1E EPS is started by an ECCS actuation signal.	16. A test will be performed to verify that~~operation of all~~ the as-built Class 1E EPS protection systems, except for overspeed, generator differential current, and high exhaust gas temperature, are bypassed when the Class 1E EPS is started by an ECCS actuation signal.	16. ~~The results of the test conclude that all t~~The as-built Class 1E EPS protection systems, except for overspeed, generator differential current, and high exhaust gas temperature ~~severe failure protection~~, are bypassed when the Class 1E EPS is started by an ECCS actuation signal.

17. The Class 1E EPSs are capable of responding to an automatic start signal when running for test purposes.	17. A test will be performed to verify that the as-built Class 1E EPSs are capable of responding to an automatic start signal while in the test mode.	17. ~~The results of the test conclude that t~~The as-built Class 1E EPSs are capable of responding to an automatic start signal when running for test purposes.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 5 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
18. Controls are provided in ~~Each Class 1E EPS can be controlled from~~ the MCR and ~~from~~ the Class 1E EPS room to start and stop each Class 1E EPS.	18. Tests~~A test~~ will be performed on ~~to verify control of~~ each as-built Class 1E EPS using the controls in the as-built MCR and the Class 1E EPS room.	18. ~~The results of the test conclude that each as-built EPS can be controlled from the~~ Controls in the as-built MCR and ~~from~~ the Class 1E EPS room start and stop each Class 1E EPS.
19. The functional arrangement of the Class 1E EPS fuel oil storage and transfer system and Class IE EPS ventilation/cooling air intake and exhaust system are~~is~~ as described in the Design Description of~~this~~ Subsection 2.6.4.2.	19. ~~An i~~Inspection of the functional arrangement of the as-built Class 1E EPS fuel oil storage and transfer system and Class IE EPS ventilation/cooling air intake and exhaust system will be performed.	19. The as-built onsite Class 1E EPS fuel oil storage and transfer system and Class IE EPS ventilation/cooling air intake and exhaust system conform~~s~~ to the functional arrangement as described in the Design Description of~~this~~ Subsection 2.6.4.2.
20. ~~The fuel oil storage and transfer system is designed and constructed in accordance with seismic Category I standards and ASME Code Section III requirements.~~ Deleted	20. ~~An inspection of the as-built fuel oil storage and transfer system will be performed.~~Deleted	20. ~~The as-built fuel oil storage and transfer system is designed and constructed in accordance with seismic Category I standards and ASME Code Section III.~~ Deleted
21. Each fuel oil transfer pump transfers fuel oil from the fuel oil storage tank to the Class 1E EPS day tank at a flow rate to support Class 1E EPS operation at continuous rated load while simultaneously increasing day tank level. Sufficient transfer pump NPSH is maintained under all design conditions.	21.a.i Analyses~~A test~~ of each ~~as-built~~ Class 1E EPS FOS transfer pump will be performed to determine the required flow rate ~~and the available NPSH~~ to support Class 1E EPS operation at continuous rated load while simultaneously increasing day tank level.	21.a.i A report exists and concludes that ~~E~~each ~~as-built~~ FOS~~fuel oil~~ transfer pump is sized~~designed~~ to transfer fuel oil from the fuel oil storage tank to the as-built Class 1E EPS day tank, at a flow rate to support Class 1E EPS operation at continuous rated load while simultaneously increasing day tank level~~and that available NPSH meets requirements under all design conditions~~.

	21.a.iib A testAn inspection of each division of the as-built Class 1E EPS FOS will be performed to verify that fuel oil transfer pump flow rate and available NPSH bound the analysis. 21.b Inspections and analyses of the Class 1E EPS FOS will be performed to determine NPSH available to each as-built Class 1E EPS FOS transfer pump.	21.a.ii.b A report exist and concludes that tThe eEach as-built Class 1E EPS FOS transfer pump flow rate and available NPSH bounds the requirements defined in the analysesis capable of supporting operation of the Class 1E EPS at continuous rated load while simultaneously increasing day tank level and maintaining sufficient NPSH under all design conditions. 21.b A report exists and concludes that the as-built NPSH available is equal to or greater than the as-built NPSH required for each Class 1E EPS FOS transfer pump under all design conditions.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 6 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
22. Each Class 1E EPS FOS day tank's capacity is sufficient to provide fuel oil for 1.5 hours of EPS~~GTG~~ operation at rated load. The fuel oil in each fuel oil day tank flows by gravity to maintain positive pressure at the fuel pumps for each Class 1E EPS.	22.i Analyses of each ~~An inspection for the existence of a report for the as-built~~ Class 1E EPS FOS will be performed to determine the required day tank capacity to provide fuel oil for 1.5 hours of EPS operation at rated load.	22.i A report exists and concludes that each ~~as-built~~ Class 1E EPS FOS day tank's capacity is sufficient to provide fuel oil for 1.5 hours of EPS~~GTG~~ operation at rated load. ~~The fuel oil in each fuel oil day tank flows by gravity to maintain positive pressure at the fuel pumps for each Class 1E EPS.~~
	22.ii Inspection of the as-built FOS day tank will be performed to verify that the tank capacity bounds the analysis and that fuel oil flows by gravity from the tank to maintain positive pressure at the fuel pump of its respective Class 1E EPS.	22.ii The as-built FOS day tank's capacity bounds the analyses and the fuel oil flows by gravity from the tank to maintain positive pressure at the fuel pump for its respective Class 1E EPS.
23. Alarms identified in Subsection 2.6.4.2 are provided in the MCR ~~for EPS support systems as described in Subsection 2.6.4.2~~.	23. Inspection~~A test~~ will be performed for retrievability of the alarms identified in Subsection 2.6.4.2 in the MCR~~on the as-built EPS support systems by providing simulated status test signals~~.	23. ~~The results of the test conclude that a~~Alarms identified in Subsection 2.6.4.2 can be retrieved ~~are provided~~ in the as-built MCR ~~for status condition in the as-built EPS support systems as described in Subsection 2.6.4.2~~.
24. ~~The system logic involves t~~The fuel oil transfer pump starts~~ing~~ automatically on a fuel oil day tank low level signal and stops~~ping~~ automatically on a fuel oil day tank high-level signal.	24. A test will be performed on the as-built fuel oil storage and transfer system by providing a simulated fuel oil day tank level test signal testing the fuel oil transfer pump.	24. The ~~results of the test conclude that~~ as-built ~~system logic involves the~~ fuel oil transfer pump starts~~ing~~ automatically on a fuel oil day tank low level signal and stops~~ping~~ automatically on a fuel oil day tank high-level signal.
25. The fuel oil transfer pumps are powered from their respective Class 1E division.	25. A test will be performed on the as-built fuel transfer pumps by providing a simulated test signal in each Class 1E division.	25. The results of the test conclude that a simulated test signal exists at the as-built fuel oil transfer pumps when the assigned Class 1E division is provided a test signal.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 7 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
26.a.i The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	26.a.i IAn inspection of the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, will be performed.	26.a.i The ASME Code Section III data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
26.a.ii The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are reconciled with the design requirements.	26.a.ii A reconciliation analysis of the components in Table 2.6.4-2 using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	26.a.ii The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that design reconciliation has been completed in accordance with ASME Code, for the as-built ASME Code Section III components of the EPS support systems identified in Table 2.6.4-2are reconciled with the design requirements. The report documents the results of the reconciliation analysis.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 8 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
26.b.i The ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2, is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	26.b.i IAn inspection of the as-built ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2, will be performed.	26.b.i The ASME Code Section III data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2, is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
26.b.ii The ASME Code Section III piping of the of the EPS support systems, including supports, identified in Table 2.6.4-2, is reconciled with the design requirements.	26.b.ii A reconciliation analysis of the piping of the EPS support systems, including supports, identified in Table 2.6.4-2, using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	26.b.ii The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that design reconciliation has been completed in accordance with ASME Code, for the as-built ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2is reconciled with the design requirements. The report documents the results of the reconciliation analysis.
27.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.	27.a Inspections of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2, will be performed in accordance with the ASME Code Section III.	27.a The ASME Code Section III code reports exist and conclude that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds in ASME Code Section III components identified in Table 2.6.4-2.

27.b Pressure boundary welds in ASME Code Section III piping, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.	27.b Inspections of the as-built pressure boundary welds in ASME Code Section III piping identified in Table 2.6.4-2, will be performed in accordance with the ASME Code Section III.	27.b The ASME Code Section III code reports exist and conclude that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds in ASME Code Section III piping identified in Table 2.6.4-2.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 9 of9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
28. ~~Quality is demonstrated and documented for each safety-related mechanical component of the EPS support systems that is not designed to ASME Code Section III.~~ Deleted	28. ~~An inspection for the existence of a report will be performed.~~ Deleted	28. ~~A report exists and documents the quality of each as-built safety-related mechanical component of the EPS support systems that is not designed to ASME Code Section III.~~ Deleted
29. Each fuel oil storage tank provides a seven day supply of fuel oil to its respective Class 1E EPS while operating at rated load.	29.i Analyses will be performed to determine the required fuel oil storage tank volume to provide a seven day supply of fuel oil to its respective Class 1E EPS while operating at rated load.~~An inspection for the existence of a report for each as-built fuel oil storage tank for the Class 1E EPS will be performed~~.	29.i A report exists and concludes that each ~~as-built~~ fuel oil storage tank for the Class 1E EPS provides a seven day supply of fuel oil to its respective Class 1E EPS while operating at rated load.
	29.ii Inspection will be performed to verify that the capacity of the as-built fuel oil storage tank bounds the analyses.	29.ii The as-built fuel oil storage tank capacity bounds the analyses.
30. Each lubrication oil tank provides a seven day supply of lubrication oil to its respective Class 1E EPS.	30.i Analyses will be performed to determine the required lubricating oil tank volume to provide a seven day supply of lubricating oil to its respective Class 1E EPS.~~An inspection for the existence of a report for each as-built lubrication oil tank for the Class 1E EPS will be performed~~.	30.i A report exists and concludes that each ~~as-built~~ lubrication oil tank for the Class 1E EPS provides a seven day supply of lubrication oil to its respective Class 1E EPS.
	30.ii Inspection will be performed to verify that the as-built lubricating oil tank volume bounds the analyses.	30.ii The as-built lubricating oil tank volume bounds the analyses.
31. Each main shaft driven lubrication oil pump circulates lubrication oil to the engine during EPS operation.	31. An inspection of each as-built main shaft driven lubrication oil pump will be performed.	31. Each as-built main shaft driven lubrication oil pump is designed to circulate lubrication oil to the engine during EPS operation.

32. Each division of the Class 1E EPSGTG combustion air intake and exhaust system is capable of supplying an adequate quantity of combustion air to the EPSGT and of disposing the exhaust gases without creating an excessive backpressure onof the EPSGT when operating at 110% of nameplate rating.	32. A test of each division of the as-built Class 1E EPSGTG at 110% of name plate ratingcombustion air intake and exhaust system will be performed.	32. Each division of the as-built Class 1E GTG EPS combustion air intake and exhaust system is capable of supplying an adequate quantity of combustion air to the EPSGT and of disposing the exhaust gases without creating an excessive backpressure onof the EPSGT when operating at 110% of nameplate rating.

Table 2.6.4-2 EPS Support Systems Equipment and Piping Characteristics

Equipment or Pipe Line Name	ASME Code Section III Class	Seismic Category
EPS fuel oil storage tanks	3	I
EPS fuel oil transfer pump suction lines from EPS fuel oil storage tank to EPS fuel oil transfer pumps	3	I
EPS fuel oil transfer pump suction line outlet check valves	3	I
EPS fuel oil transfer pump suction line isolation valves	3	I
EPS fuel oil transfer pumps	3	I
EPS fuel oil transfer pump discharge lines up to EPS fuel oil day tank	3	I
EPS fuel oil transfer pump discharge line check valves	3	I
EPS fuel oil transfer pump discharge line isolation valves	3	I
EPS fuel oil day tanks	3	I
EPS fuel oil day tank outlet lines up to EPS	3	I
EPS fuel oil day tank outlet valves	3	I
EPS starting system air compressor discharge lines up to air supply header	3	I
EPS starting system air compressor discharge line isolation valves	3	I
EPS starting system air supply headers	3	I
EPS starting system air supply header outlet lines up to air receiver	3	I
EPS starting system air supply header outlet line isolation valves	3	I
EPS starting system air receiver inlet check valves	3	I
EPS starting system air receivers	3	I
EPS starting system air receiver relief valves	3	I
EPS starting system air receiver outlet lines up to air starting unit	3	I
EPS starting system air start valves	3	I
EPS starting system air start pilot valves	3	I
EPS starting system air starting unit outlet lines up to air starter	3	I
EPS lubrication system main oil pumps	-	I
EPS lubrication system oil coolers	-	I
EPS lubrication system reduction gear reservoirs	-	I
EPS lubrication system main oil filters	-	I
EPS lubrication system main lube oil strainers	-	I
EPS lubrication system piping, fittings and valves	-	I
EPS combustion air intake and exhaust system intake silencers	-	I
EPS combustion air intake and exhaust system turbine exhaust silencers	-	I
EPS combustion air intake and exhaust system piping	-	I

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.5

Item No.	Explanation/Basis for Change
Design Description 2.6.5	
A	A clarification statement was added regarding the redundancy of the AAC power source. Statement is consistent with Tier 2, Section 8.4. Also made editorial changes.
B	Added to provide consistency with the corresponding functional description DC.
C	Notes 1 and 2. See items O and P.
D	Notes 1 and 2. See item P.
E	Notes 1 and 2. See item Y.
F	Notes 1 and 2. See item R.
G	Note 2. See item V. This change alters the response to RAI 182, 14.03.06-11.
H	Notes 1 and 2. See item U.
I	Notes 1 and 2. See item W and ITAAC item #9.
J	Notes 1 and 2. See item U. This change alters the response to RAI 182, 14.03.06-11.
K	Added to provide consistency with the corresponding functional description DC.
L	See ITAAC Table item #12.
M	Notes 1 and 2. New ITAAC added, see ITAAC item #13. See item T.
N	Deleted, no corresponding ITAAC. Unnecessary detail for non-safety system in Tier 1. Item M already requires that the AAC GTG is adequately sized.
O	Notes 1 and 2. See item C.
P	Notes 1 and 2. See items C and D.
Q	Text deleted because no corresponding ITAAC and design requirement no longer a key design feature. This change alters the response to RAI 222, 14.03.11-20.
R	Notes 1 and 2. See item F.
S	Text deleted because there was no corresponding ITAAC and it was not a design requirement. Not required by SRP 14.3.
T	Notes 1 and 2. New ITAAC added, see ITAAC Table #14. The sizing aspect of the existing text is addressed in item M and new ITAAC item #13.
U	Notes 1 and 2. See items H and J.
V	Note 2. See item G.
W	Notes 1 and 2. See item I.
X	Editorial
Y	Notes 1 and 2. See item E.
Z	Text deleted because it was unnecessary. Editorial.
AA	Text deleted because item G already requires 8 hours of fuel capacity for AAC GTG fuel oil storage tanks. No corresponding ITAAC for AAC power source day tank and no need for one is identified.
BB	Editorial
ITAAC Table 2.6.5-1	
1	No changes
2	No changes
3	DC, AC – Note 1. This change does not impact the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, third bullet]

Item No.	Explanation/Basis for Change
4	DC, ITA, AC – Note 1. Also, statement regarding "normal" position was removed because it was not appropriate for a DC. [RIS p7, Consistency, third bullet and p4, Nomenclature, seventh bullet]
5	No changes
6	ITA, AC – Clarified to indicate that the test condition would be a "simulated" SBO condition. [RIS p5, Logic, sixth bullet] AC – Change made for consistency with other AC where the ITA is a test. This change alters the response to RAI 182, 14.03.06-6. . [RIS p5, Logic, seventh bullet]
7	DC – Change made to clarify intent of DC. This change alters the response to RAI 182, 14.03.06-11. [RIS p7, Consistency, third bullet] ITA – Analysis added because it is necessary to determine the required fuel capacity. This change does not impact the response to RAI 182, 14.03.06-11. [RIS p5, Logic, sixth bullet] AC – Change made to reference a report where "analysis" is specified in the ITA. This change does not impact the response to RAI 182, 14.03.06-11. [RIS p5, Logic, seventh bullet] DC, ITA, AC – Change made to provide consistent wording. [RIS p7, Consistency, third bullet]
8	DC – Revised to provide specificity regarding the scope of the DC. This change alters the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, third bullet] ITA – Revised because a test is a more appropriate ITA for a control than an inspection. [RIS p5, Logic, sixth bullet] AC – Revised to provide consistency with revised DC and ITA. This change alters the response to RAI 182, 14.03.06-6. [RIS p7, Consistency, second bullet]
9	DC – The maximum allowable time (i.e., 100 seconds) for AAC sources to provide power is not a safety basis value and should not be included in Tier 1. Tier 2, Section 8.4, SBO analysis does not rely on this 100 second value. ITAAC #6 already requires verification that the AAC can provide power to Class 1E buses within 60 minutes. This change alters the response to RAI 182, 14.03.06-11. AC – Revised for clarity and to be consistent with DC. This change alters the response to RAI 182, 14.03.06-9. [RIS p7, Consistency, second bullet]
10	DC, ITA, AC – Revised to provide clarity of scope. This change alters the response to RAI 182, 14.03.06-11. [RIS p7, Consistency, third bullet]
11	No changes

Item No.	Explanation/Basis for Change
12	DC, ITA, AC – Existing ITAAC is deleted because it does not meet SRP selection criteria. SRP Section 14.3.6 specifies testing for capacity and capability, not reliability (new ITAAC added in item #13 below to address capacity). Furthermore, the 95% reliability criteria is not a key design feature as described in Tier 2 Section 14.3. DCD Tier 2, Section 8.4 states that either one of the AAC GTG alone meet the requirements of RG 1.155, so the 95% reliability value for both is not required to meet the regulations. The verification of reliability will be addressed by adding a commitment to Tier 2, Section 8.4 to require an analysis to be performed prior to initial fuel load to verify the reliability of the as-built AAC power sources using historical industry data for similar components. Additionally, Tier 2, Section 8.4 already requires that the AAC power sources will be inspected and tested periodically to demonstrate operability and reliability, and that the reliability of the AAC power system will meet or exceed 95% as determined in accordance with NSAC-108 or equivalent methodology to meet the Criterion 5 of Section C.3.3.5, RG 1.155. This change alters the responses to RAI 327, 09.04.01-6 and RAI 582, 09.04.01-20.
13	DC, ITA, AC – New ITAAC added to verify capacity of the AAC power sources and to verify that the size of the AAC power sources and Class 1E EPS are different (key design insight). These requirements already exist in the Design Description.
14	DC, ITA, AC – New ITAAC added to verify diverse starting mechanisms. This requirement already existed in the Design Description.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.5 Alternate AC (AAC) Power Source

2.6.5.1 AAC Design Description

Two AAC power sources are provided to supply ~~AAC~~ac power in case there is a complete loss of offsite power (LOOP) and ~~of~~ Class 1E EPSs. AAC power sources supply power to loads required to bring and maintain the plant in a safe shutdown condition for a~~n~~ station blackout (SBO) condition. AAC power sources also provide power to the 6.9kV permanent buses during a LOOP condition. The AAC sources and their connections to Class 1E 6.9kV buses and to non-Class 1E 6.9kV permanent buses are shown on Figure 2.6.1-1. These AAC power sources are non-Class 1E and non-seismic. The two AAC power sources are redundant in that only one AAC power source is required to meet SBO requirements. A

1. The functional arrangement of the AAC power sources is as described in the Design Description of Subsection 2.6.5.1. B

~~1.~~2. The AAC power sources are located in separate dedicated rooms.

3. Each AAC power source is isolated from the Class 1E power supply systems by a non-Class 1E disconnect switch and a Class 1E circuit breaker connected in series. C

~~2.~~4. The Class 1E circuit breakers for the AAC power sources in Class 1E medium voltage switchgear are connected to disconnect switches (non-Class 1E) in selector circuits. D

~~3.~~5. Separate and independent fuel supply systems and onsite fuel storage tanks are provided for Class 1E EPSs and AAC power sources. E

~~4.~~6. The AAC power sources can be started and connected manually to onsite Class 1E medium voltage buses within 60 minutes during SBO conditions. F

~~5.~~7. The AAC power sources fuel oil storage tanks have enough fuel capacity to supply power to the required SBO loads for 8 hours. G

~~6.~~8. Controls exist in the MCR to start, stop and synchronize the AAC power sources. H

~~7.~~9. Each AAC power source is capable of providing power at the set voltage and frequency to the non-Class 1E 6.9kV buses after receiving a start signal. I

~~8.~~10. Each AAC power source status and the breaker status of each Class 1E 6.9kV breaker for the AAC power sources are displayed in the MCR. J

11. The functional arrangement of the AAC fuel oil storage and transfer system is as described in the Design Description of Subsection 2.6.5.2. K

12. Deleted L

13. The two AAC power sources are each sized to meet load requirements for SBO and LOOP conditions. The size of the AAC power source is different than the Class 1E EPSs. M

The generator lead cables are adequately sized to carry the rated output of the AAC power source and withstand the maximum available fault current. N

The connection between the Class 1E 6.9kV buses and non-Class 1E AAC power sources are provided through two isolation devices in series which are normally open. O

One Class 1E circuit breaker is provided at the Class 1E 6.9kV switchgear and the other is a non-Class 1E disconnect switch at the selector circuit. P

Circuit breaker panels of the alternate ac system and cables associated with alternate ac power to safety buses in the T/B electrical room are segregated into two groups by qualified fire barriers. Q

From the onset of an SBO event, one Class 1E 6.9kV switchgear bus is manually connected to an AAC power source within one hour. Loads required for SBO are manually started to allow the plant to achieve and maintain a safe shutdown condition. R

The AAC power system is inspected and tested periodically to demonstrate operability and reliability. S

14. The two AAC power sources have a diverse starting system from the Class 1E EPSsThe AAC power sources are of different size and have different starting system from the EPSs. T

Manual and automatic operation (e.g. start, stop and synchronization) are provided in the MCR. Each AAC power source and each Class 1E 6.9 kV breaker status information is available in the MCR. U

The AAC GTGs have enough fuel capacity to supply power to the required SBO loads for 8 hours. V

Each AAC power source is capable of providing power at the set voltage and frequency to the non-Class 1E 6.9kV buses within the maximum allowable time from receiving a start signal. W

2.6.5.2 AAC Fuel Oil Storage and Transfer Systems (FOS) Design Description

Each AAC power source is provided with dedicated fuel oil supply system, fuel oil day tank and storage tank:

- The AAC FOSs are non safety-related systems. X

- FOS is not shared by the EPS power sources. Y

The AAC FOS design features include: Z

- ~~Each fuel oil day tank provides sufficient fuel for 1.5 hours of AAC power source operation.~~
- Each AAC fuel oil day tank is located inside the associated AAC power source room in the PS/B.

AA

BB

2.6.5.3 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.5.1-1 describes the ITAAC for the AAC power source.

Table 2.6.5-1 AAC Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the AAC power sources ~~are~~is as described in the Design Description of Subsection 2.6.5.1.	1. An inspection of the functional arrangement of the as-built AAC power sources will be performed.	1. The as-built AAC power sources conform to the functional arrangement described in the Design Description of Subsection 2.6.5.1.
2. The AAC power sources are located in separate dedicated rooms.	2. An inspection of the location of the as-built AAC power sources will be performed.	2. The as-built AAC power sources are located in separate dedicated rooms.
3. Each AAC power source is isolated from the Class 1E power supply systems by a non-Class 1E disconnect switch and a Class 1E circuit breaker connected in series.	3. An inspection of the as-built non-safety disconnect switch and Class 1E circuit breaker between each AAC power source and the emergency Class 1E power supply systems will be performed.	3. Each as-built AAC power source is isolated from the as-built Class 1E power supply systems by a non-safety disconnect switch and a Class 1E circuit breaker connected in series.
4. The Class 1E circuit breakers for the AAC power sources in Class 1E medium voltage switchgear~~s~~ are connected to disconnect switches (non-Class 1E) in selector circuits ~~which are normally open and do not have any automatic closing function~~.	4. An inspection of the as-built Class 1E circuit breakers for the AAC power sources in the Class 1E medium voltage switchgear~~s~~ which are connected to disconnect switches (non-Class 1E) in selector circuits will be performed.	4. The as-built Class 1E circuit breakers for the AAC power sources in the Class 1E medium voltage switchgear~~s~~ are connected to disconnect switches (non-Class 1E) in selector circuits ~~which are normally open and do not have any automatic closing function~~.
5. Separate and independent fuel supply systems and onsite fuel storage tanks are provided for Class 1E EPSs and AAC power sources.	5. An inspection of the as-built fuel supply systems and onsite fuel storage tanks for the Class 1E EPSs and the AAC power sources will be performed.	5. Separate and independent fuel supply systems and onsite fuel storage tanks are provided for the as-built Class 1E EPSs and the AAC power sources.
6. The AAC power sources can be started and connected manually to onsite Class 1E medium voltage buses within 60 minutes during SBO conditions.	6. A test will be performed to verify that the as-built AAC power sources can be started and connected manually to the as-built onsite Class 1E medium voltage buses within 60 minutes during simulated SBO conditions.	6. ~~The results of the test conclude that t~~The as-built AAC power sources can be started and connected manually to the as-built onsite Class 1E medium voltage buses within 60 minutes during simulated SBO conditions.

7. The AAC power sourcesGTGs fuel oil storage tanks have enough fuel capacity to supply power to the required SBO loads for 8 hours.	7.i Analyses will be performed to determine the required AAC power sources fuel oil storage tank capacity to supply power to the required SBO loads for 8 hours.	7.i A report exists and concludes that Tthe as-built AAC power sourcesGTGs have enough fuel oil storage tank capacity to supply power to the required SBO loads for 8 hours.
	7.ii An inspection of the as-built AAC power sources fuel oil storage tanks will be performed to verify that the fuel capacity bounds the analyses.	7.ii The as-built AAC power sources fuel oil storage tanks have fuel capacity that bounds the analyses.

Table 2.6.5-1 AAC Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. Controls exist in the MCR to~~The operation (e.g.~~ start, stop and synchronize~~ation)~~ ~~of~~ the AAC power sources ~~are provided in the MCR~~.	8. Test~~An inspection of the as-built MCR~~ will be performed on the as-built AAC power sources using the controls in the as-built MCR.	8. Controls in the as-built MCR ~~The operation (e.g.~~ start, stop and synchronize~~ation) of~~ the as-built AAC power sources~~ are provided in the as-built MCR~~.
9. Each AAC power source is capable of providing power at the set voltage and frequency to the non-~~-~~Class 1E 6.9kV buses after~~within the maximum allowable time from~~ receiving a start signal.	9. A test will be performed to verify that the as-built AAC power source can reach set voltage and frequency.	9. Each as-built AAC power source can reach~~is capable of providing power at the~~ set voltage and frequency to the non-Class 1E 6.9kV buses after~~within 100 seconds from~~ receiving a start signal.
10. Each AAC power source status and the breaker status of each Class 1E 6.9kV breaker for the AAC power sources are displayed in the MCR.	10. An inspection of the AAC power source status indications in the as-built MCR will be performed.	10. Each as-built AAC power source status and the breaker status of each Class 1E 6.9kV breaker for the AAC power sources are displayed in the as-built MCR.
11. The functional arrangement of the AAC fuel oil storage and transfer system is as described in the Design Description of Subsection 2.6.5.2.	11. An inspection of the functional arrangement of the as-built AAC fuel oil storage and transfer system will be performed.	11. The as-built AAC fuel oil storage and transfer system conforms to the functional arrangement as described in the Design Description of Subsection 2.6.5.2.
12. ~~The reliability of the AAC power sources meet or exceed 95 percent.~~ Deleted	12. ~~An analysis of the reliability of the as-built AAC power sources will be performed.~~ Deleted	12. ~~The reliability of the as-built AAC power sources meet or exceed 95 percent.~~ Deleted

13 The two AAC power sources are each sized to meet the load requirements for SBO and LOOP conditions. The size of the AAC power source is different than the Class 1E EPSs.	13.i Analyses will be performed to verify the AAC power sources are each sized to meet load requirements for SBO and LOOP conditions. 13.ii Inspection will be performed to verify that the ratings of the as-built AAC power sources bound the analyses. 13.iii Inspection will be performed to verify that the size of the as-built AAC power sources is different than the as-built Class 1E EPSs.	13.i A report exists and concludes that the two AAC power sources are each sized to meet load requirements for SBO and LOOP conditions. 13.ii. The ratings of the two as-built AAC power sources bound the analyses. 13.iii The size of the AAC power sources is different than the Class 1E EPSs.
14 The two AAC power sources have a diverse starting mechanism from the Class 1E EPSs.	14 An inspection of the as-built starting mechanisms for the Class 1E EPSs and the AAC power sources will be performed.	14 Diverse starting mechanisms are provided for the as-built Class 1E EPSs and the as-built AAC power sources.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.6

Item No.	Explanation/Basis for Change
Design Description 2.6.6	
A	Text deleted because Tier 1 and ITAAC are not required to address all plant normal lighting.
B	Note 2. See item I. Additional text provided regarding locations of emergency lighting to provide criteria for the functional arrangement ITAAC. Information copied from Tier 2, Section 9.5.3.2.2.1.
C	Note 2. See item L.
D	See ITAAC item #1.
E	Text added to provide consistency with the corresponding DC.
F	Note 1. This change alters the response to RAI 182, 14.03.06-11.
G	Text deleted and not included in functional arrangement discussion because normal/emergency lighting is not required to be verified by SRP 14.3.6 which specifies verification of portions of the plant lighting required to remain available during accident scenarios and power failures.
H	Note 1
I	Note 2. See item B.
J	Notes 1 and 2. See item O.
K	Note 1
L	Note 2. See item C. This change alters the response to RAI 182, 14.03.06-11.
M	Notes 1 and 2. See item P.
N	Notes 1 and 2. See item P.
O	Notes 1 and 2. See item J.
P	Notes 1 and 2. See items M and N.
ITAAC Table 2.6.6-1	
1	DC, ITA, AC – ITAAC deleted because only the emergency lighting system needs to be addressed and other table items adequately address emergency lighting. Change is consistent with SRP 14.3.
2	DC, ITA, AC – Revised to make consistent with other functional arrangement ITAAC. [RIS p5, Logic, seventh bullet]
3	DC, AC – Note 1. [RIS p7, Consistency, third bullet]
4	DC, AC – Note 1. This change does not impact the response to RAI 80, 09.05.03-7. [RIS p7, Consistency, third bullet]
5	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 80, 09.05.03-7 and RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]

Item No.	Explanation/Basis for Change
6	DC, ITA, AC – Editorial clarification AC – Revised to contain more definitive acceptance criteria and eliminate extraneous text in the AC. The 8-hour battery capacity is verified in ITAAC item #7. This change alters the response to RAI 30, 09.05.01-9 and RAI 182, 14.03.06-11. [RIS p7, Consistency, second bullet]
7	DC, AC – Revised to make the acceptance criteria more specific and less vague. This change alters the response to RAI 80, 09.05.03-10 and RAI 34, 09.05.03-6. [RIS p7, Consistency, second bullet] DC, ITA, AC – Clarified terminology. This change alters the response to RAI 80, 09.05.03-10 and RAI 34, 09.05.03-6. [RIS p7, Consistency, third bullet]
8	DC, AC – Revised to remove the reference to the IESNA standard and include the specific acceptance criteria numerical value, consistent with SRP guidance regarding references to standards in Tier 1. This change alters the response to RAI 80, 09.05.03-10 and RAI 34, 09.05.03-6. [RIS p7, Consistency, second bullet] DC, ITA, AC – Editorial changes

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.6 Plant Lighting Systems

2.6.6.1 Design Description

The plant lighting systems includes normal and emergency lighting systems. The plant lighting systems are non-safety-related and non-Class 1E.

The normal plant lighting is provided in all plant indoor and outdoor areas during all normal and emergency modes of plant operation. Normal plant lighting is powered from plant non-Class 1E ac power systems. A

The emergency lighting system includes normal/emergency (N/E) lighting system, emergency lighting system being powered by the Class 1E power system, and self-contained battery pack emergency lighting system. Emergency lighting powered by the Class 1E power system is provided in the following areas: B

- MCR
- Remote shutdown consoles
- Class 1E emergency generator rooms
- Class 1E switchgear, motor control center, Class 1E uninterruptible power supply (UPS) panels
- Battery and battery charger rooms
- Access and egress routes to the remote shutdown consoles

The self-contained battery pack emergency lighting system is provided in areas where emergency operations are performed, to enable safe ingress and egress of personnel. C

1. Deleted D
2. The functional arrangement of the emergency lighting system is as described in the Design Description of Subsection 2.6.6.1. E

1.3. The normal/emergencyN/E lighting system is capable of being powered fromby the non-Class 1E 480 V permanent buses. N/E lighting is provided in all areas of the plant except the areas that have emergency lighting powered by the Class 1E power sources. F G

2.4. The Eemergency lighting system powered by the Class 1E power system in the MCR and remote shutdown console room is powered from the redundant Class 1E dc power systems. Emergency lighting powered by the Class 1E power system in areas where emergency operations are performed (e.g. MCR, Remote shutdown console room) is powered by the Class 1E 480V power system. H I

3.5. The emergency lighting system supports in the MCR and remote shutdown console room can withstand seismic design basis loads without loss of safety function. J

6. The Sself-contained battery pack emergency lighting system is normally powered from the ac power systems and powered from self-contained battery packs if normal ac power is lost. The self-contained battery pack emergency lighting system is provided in areas where emergency operations are performed, to enable safe ingress and egress of personnel. K L

4.7. The self-contained battery pack units provide illumination of at least 0.5 foot-candles at the floor level for 8-hours. M

8. The emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles provides required illumination levels for at least 8 hours. N O

Emergency lighting system in MCR meets seismic Category I requirements.

Normal and emergency lighting system, together, provide the required illumination levels in each area. P

2.6.6.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.6-1 describes the ITAAC for the plant lighting systems.

Table 2.6.6-1 Plant Lighting Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. ~~The plant lighting systems includes normal, emergency, and security lighting systems.~~ Deleted	1. ~~An inspection of the as-built plant lighting systems will be performed.~~ Deleted	1. ~~The as-built plant lighting systems includes normal, emergency, and security lighting systems.~~ Deleted
2. The functional arrangement of the emergency lighting system is as described in the Design Description of Subsection 2.6.6.1. ~~The emergency lighting system includes normal/emergency lighting system, emergency lighting system powered by Class 1E power system, and self-contained battery pack emergency lighting system~~.	2. An inspection of the functional arrangement of the as-built emergency lighting system will be performed.	2. The as-built emergency lighting system conforms to the functional arrangement described in the Design Description Subsection 2.6.6.1 ~~includes normal/emergency lighting system, Class 1E emergency lighting system powered by Class 1E power system and self-contained battery pack emergency lighting system~~.
3. The normal/emergency lighting system is powered from the non-Class 1E 480V permanent ~~AAC~~ buses.	3. An inspection of the as-built normal/emergency lighting system will be performed.	3. The as-built normal/emergency lighting system is capable of being powered from the non-Class 1E 480V permanent ~~AAC~~ buses.
4. The emergency lighting system powered by the Class 1E power system in the MCR and remote shutdown console room is powered from redundant Class 1E dc power systems.	4. An inspection of the as-built emergency lighting system powered by the Class 1E power system in the as-built MCR and remote shutdown console room will be performed.	4. The as-built emergency lighting system powered by the Class 1E power system in the as-built MCR and remote shutdown console room is powered from redundant Class 1E dc power systems.
5. The emergency lighting system supports in the MCR and remote shutdown console room can ~~is designed to~~ withstand seismic design basis loads ~~ing~~ without loss of safety function.	5.i Inspections will be performed to verify that the as-built emergency lighting system supports in the MCR and remote shutdown console room ~~equipment~~ are ~~is~~ located in a seismic Category I structure ~~the reactor building~~.	5.i The as-built emergency lighting system supports in the MCR and remote shutdown console room are ~~is~~ located in a seismic Category I structure ~~the reactor building~~.

	5.ii Type tests, analysis, or a combination of type tests and/or analyses of the emergency lighting system supports in the MCR and remote shutdown console roomequipment will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	5.ii A report exists and concludes The results of the type tests and/or analyses conclude that the emergency lighting system supports in the MCR and remote shutdown console room can withstand seismic design basis loads without loss of safety function.
	5.iii Inspections and analysesAn inspection will be performed to verify thaton the as-built emergency lighting system supports including anchorages in the MCR and remote shutdown console roomequipment including anchorage are seismically bounded by the tested or analyzed conditions.	5.iii A report exists and concludes that the The as-built emergency lighting system supports including anchorages in the MCR and remote shutdown console room including anchorage isare seismically bounded by the tested or analyzed conditions.

Table 2.6.6-1 Plant Lighting Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. The self-contained battery pack emergency lighting system is normally powered from the ac power system and powered from self-contained battery packs if the normal ac power is lost.	6. An inspection of the as-built self-contained battery pack emergency lighting system will be performed.	6. The as-built self-contained battery pack emergency lighting system is normally powered from the ac power system and powered from self-contained battery packs if the normal ac power is lost to support access, egress, and operations activities for a minimum of 8-hours.
7. The dc self-contained battery pack units provide illumination of at leastabout 0.5 foot-candles at the floor level for at least 8-hours.	7. Ann test of the as-built dc self-contained battery pack units will be performed.	7. The as-built dc self-contained battery pack units provide illumination of at leastabout 0.5 foot-candles at the floor level for at least 8-hours.
8. The emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles provides required illumination levels in those areas equal to greater than those recommended by the IESNA for at least 8 hours.	8. Ann test of the emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles will be performed.	8. The as-built emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles provides illumination levels in those areas equal to or greater than 10 foot-candlesthose recommended by the IESNA for at least 8 hours.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.7

Item No.	Explanation/Basis for Change
Design Description 2.6.7	
A	Text added to provide consistency with the corresponding DC.
B	Note 1. Text deleted because it was too detailed for Tier 1 and not part of the ITAAC DC. This change alters the response to RAI 182, 14.03.06-6.
C	Note 1
D	Note 1
E	Note 1. This change does not impact the response to RAI 182, 14.03.06-6.
ITAAC Table 2.6.7-1	
1	No changes
1.a	No changes
1.b	DC, AC – Note 1. This change does not impact the response to RAI 182, 14.03.06-9. [RIS p7, Consistency, second bullet]
1.c	DC, ITA, AC – Note 1 [RIS p7, Consistency, second bullet]
2	DC, AC – Revised to provide clarity and consistency with Tier 1 terminology. This change alters the response to RAI 424, 14.03.06-18. [RIS p7, Consistency, second bullet]

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

2.6.7 Grounding and Lightning Protection System

2.6.7.1 Design Description

The grounding and lightning protection system consists of the following:

- Station ground grid
- System neutral grounding
- Equipment grounding
- I&C grounding
- Lightning protection

The station ground grid consists of buried, interconnected bare copper conductors and ground rods forming a plant ground grid matrix.

1. The following grounding systems connect to the station ground grid: A

   a. The system neutral grounding ~~provides grounding of the neutral points~~ of the MG, MT, UATs, RATs, SSTs, Class 1E EPSs and AAC power sources. ~~The neutrals of the MG, Class 1E EPSs and AAC power sources is grounded through grounding transformers providing high-resistance grounding. The MT and SST low voltage neutrals are grounded solidly. The UAT and RAT low voltage winding neutrals are resistance-grounded.~~ B

   b. The equipment grounding for~~provides bonding of the~~ equipment enclosures, raceways, metal structures, metallic tanks, and the ground bus of switchgear, load centers, MCCs, switchboards, panel boards and control cabinets~~to the station ground grid~~. C

   c. The I&C grounding which includes a ~~provides the isolated signal ground required by plant I&C systems. A~~ separate radial grounding system consisting of isolated instrumentation ground buses and insulated cables~~is provided. The radial grounding systems are connected to the station ground grid and are insulated from all other grounding circuits~~. D

2. Lightning protection is provided for standard design buildings and exposed structures. ~~Surge arrestors are provided to protect the MT, UATs, RATs, isolated phase busduct and the medium-voltage switchgear from lightning surges. Surge arresters are connected directly to the ground grid in order to provide a low-impedance path to ground for the surges caused or induced by lightning. Thus, fire or damage to the plant from a lightning strike is avoided.~~ E

2.6.7.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.7-1 describes the ITAAC for the grounding and lightning protection system.

Table 2.6.7-1 Grounding and Lightning Protection System Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The following grounding systems connect to the station grounding grid:	1. An inspection of the as-built grounding system will be performed to verify:	1. The following as-built grounding systems connect to the station grounding grid:
a. the system neutral grounding of the MG, MT, UATs, RATs, SSTs, Class 1E EPSs and AAC power sources	a. the system neutral grounding connects to station grounding grid	a. the system neutral grounding of the MG, MT, UATs, RATs, SST, Class 1E EPSs and AAC power sources
b. the equipment grounding foref the equipment enclosures, raceways, and metal structures, metallic tanks, and the ground bus of switchgear, load centers, MCCs, switchboards and control cabinets.	b. the equipment grounding connects to station grounding grid	b. the equipment grounding foref the equipment enclosures, raceways, and metal structures, metallic tanks, and the ground bus of switchgear, load centers, MCCs, switchboards, and control cabinets.
c. the I&C grounding which includes a separate radial grounding system consisting of isolated instrumentation ground buses and insulated cables.	c. the I&C grounding connects to station grounding grid and includes a separate radial grounding system consisting of isolated instrumentation ground buses and insulated cables.	c. the I&C grounding which includes a separate radial grounding system consisting of isolated instrumentation ground buses and insulated cables.
2. Lightning protection system is provided for standard designUS-APWR buildings and exposed structures.	2. Inspection of the as-built lightning protection system will be performed.	2. The as-built lightning protection system for standard designplant buildings and exposed structures exist.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.6.8

Item No.	Explanation/Basis for Change
Design Description 2.6.8	
A	Note 1
B	Notes 1 and 2. See item E.
C	Note 1
D	Note 1
E	Notes 1 and 2. See item B.
ITAAC Table 2.6.8-1	
1	ITA – Editorial correction.
2	DC, ITA, AC – Generic changes made to seismic ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. [RIS p5, Logic, seventh bullet]
3	DC, ITA, AC – Generic changes made to the separation ITAAC to provide clarity and consistency. [RIS p5, Logic, seventh bullet]
4	DC, ITA, AC – Revised to provide clarity and consistency with Tier 2. [RIS p7, Consistency, fourth bullet]
5	5.i AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
6	6.i AC – Change made to reference a report where "analysis" is specified in the ITA. This change alters the response to RAI 182, 14.03.06-10. [RIS p5, Logic, seventh bullet]
7	DC, ITA, AC – Generic changes made to environmental qualification ITAAC to provide clarity and consistency. This change alters the response to RAI 182, 14.03.06-8. This change incorporates the changes described in the response to RAI 511, 03.11-21.[RIS p5, Logic, seventh bullet]

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.6.8 Containment Electrical Penetration Assemblies (EPAs)

2.6.8.1 Design Description

1. Electric power, control and instrumentation circuits pass through the containment vessel boundary wall via electrical penetration assemblies (EPAs). A
2. Each EPAs can withstand seismic design basis loads without loss of safety function.are classified as seismic Category I and qualified for postulated environmental conditions. B
3. Separation is providedmaintained between redundant divisions of EPAs containing Class 1E circuits and between EPAs containing Class 1E circuits and EPAs containing non-Class 1E circuits. C
4. Separate penetrations are provided for medium voltage circuits, and low voltage circuits, control power circuits, control, and instrumentation signal circuitsfunctions. D
5. The primary circuit protection device for each EPA circuit is sized to ensure electrical integrity of the circuit for postulated overload and short-circuit conditions.
6. The back up circuit protection device for each EPA circuit is sized to ensure mechanical integrity of the EPA for postulated overload and short-circuit conditions, during normal and accident conditions.
7. Each EPA as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function. E

2.6.8.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.8-1 describes the ITAAC for the EPAs.

Table 2.6.8-1 Containment Electrical Penetration Assemblies Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The electric power, control and instrumentation circuits pass through the containment vessel boundary wall via electrical penetration assemblies (EPAs).	1. An inspection of the as-built electric power, control and instrumentation circuits that pass through the as-built containment vessel boundary wall will be performed.	1. The as-built electric power, control and instrumentation circuits pass through the as-built containment vessel boundary wall via the as-built EPAs.
2. Each EPA canis designed to withstand seismic design basis loads without loss of safety function.	2.i Inspections will be performed to verify that each as-built EPA is located in a seismic Category I structurethe reactor building and containment vessel.	2.i Each as-built EPA is located in a seismic Category I structurethe reactor building and containment vessel.
	2.ii Type tests, analyses, or a combination of type tests and and/or analyses of each EPA will be performed using analytical assumptions, or will be performed under conditions which bound the seismic design basis requirements.	2.ii A report exists and concludes that The results of the type tests and/or analyses conclude that each EPA can withstand seismic design basis loads without loss of safety function.
	2.iii Inspections and analyses will be performed to verify that An inspection will be performed on each as-built EPA, including anchorages, is seismically bounded by the tested or analyzed conditions.	2.iii A report exists and concludes that Eeach as-built EPA, including anchorages, is seismically bounded by the tested or analyzed conditions.
3. Separation is providedmaintained between redundant divisions of EPAs containing Class 1E circuits and between EPAs containing Class 1E circuits and EPAs containing non-Class 1E circuits.	3. An iInspections of the as-built EPAs containing the Class 1E circuits and the as-built EPAs containing the non-Class 1E circuits will be performed.	3. The sSeparation is provided in accordance with RG 1.75 maintained between -the as-built redundant divisions of EPAs containing the Class 1E circuits and between the as-built EPAs containing the Class 1E circuits and the as-built EPAs containing the non-Class 1E circuits.

4. Separate penetrations are provided for medium voltage circuits, and low voltage circuits, control power circuits, control, and instrumentation signal circuitsfunctions.	4. An inspection of the as-built penetrations for the medium voltage circuits,and low voltage circuits, control power circuits, control, and instrumentation signal circuitsfunctions will be performed.	4. The as-built modules for medium voltage power circuits (e.g., 6.9 kV) are in medium voltage power penetrations; modules for low voltage power circuits (e.g., 480 V) are in low voltage power penetrations; modules for control power circuits (e.g., 120/125V) are in control power penetrations and modules for instrumentation signal circuits are in instrumentation penetrationsseparate penetrations are provided for the medium voltage and low voltage power, control, and instrumentation functions.
5. The primary circuit protection device for each EPA circuit is sized to ensure electrical integrity of the circuit for postulated overload and short-circuit conditions.	5.i An analysis will be performed to verify the primary circuit protection device for each EPA circuit is sized to ensure electrical integrity of the circuit for postulated overload and short-circuit conditions.	5.i A report exists and concludes that Tthe primary circuit protection device for each EPA circuit is sized to ensure electrical integrity of the circuit for postulated overload and short-circuit conditions.
	5.ii An inspection will be performed to verify the ratings of the as-built primary circuit protection device for each EPA circuit bound the requirements of the analysis.	5.ii The ratings of the as-built primary circuit protection device for each EPA circuit bound the requirements of the analysis.

Table 2.6.8-1 Containment Electrical Penetration Assemblies Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. The back up circuit protection device for each EPA circuit is sized to ensure mechanical integrity of the EPA for postulated overload and short-circuit conditions, during normal and accident conditions.	6.i An analysis will be performed to verify the back up circuit protection device for each EPA circuit is sized to ensure mechanical integrity of the EPA for postulated overload and short-circuit conditions, during normal and accident conditions.	6.i A report exists and concludes that ~~T~~the back up circuit protection device for each EPA circuit is sized to ensure mechanical integrity of the EPA for postulated overload and short-circuit conditions, during normal and accident conditions.
	6.ii An inspection will be performed to verify ratings of the back-up circuit protection device for each as-built EPA circuit bound the requirements of the analysis.	6.ii The ratings of the back-up circuit protection device for each as-built EPA circuit bound the requirements of the analysis.
7. Each EPA as being qualified for a harsh environment can~~is designed to~~ withstand the environmental conditions that would exist before, during, and following a design basis accident~~event~~ without loss of safety function for the time required to perform the safety function.	7.i Type tests or a combination of type tests and~~and/or~~ analyses using the design environmental conditions or under the conditions which bound the design environmental conditions will be performed on the EPAs located in a harsh environment.	7.i A report exists and concludes~~The results of the type tests and/or analyses conclude~~ that each EPA as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident~~event~~ without loss of safety function for the time required to perform the safety function.
	7.ii Inspection will be performed on each as-built EPA located in a harsh environment.	7.ii Each as-built EPA as being qualified for a harsh environment is bounded by type tests, or a combination of type tests and ~~and/or~~ analyses.