Responses to NRC Comments on Tier 1 Section 2.6 (1/7)

No	Tier 1 Section	Comment	Response	NOTES
1*	Section 2.6.4, Table 2.6.4-2	Confirm that the ASME boundary information is not being removed from the simplified P&IDs planned to be added to Tier 2. If they are, provide another means of confirming the list of ASME components in Tier 2.	**The ASME boundary information will exist in the simplified P&ID.**	
2*	Section 2.6.4, ITAAC #21b	Review the ITA for ITAAC 2.6.4-1, item 21, regarding the NPSH and possibly proposed alternative wording.	**See Attachment 3 for the proposed alternative wording.**	
3*	Section 2.6.5, ITAAC #12	ITAAC 2.6.5 (95% reliability of AAC): Evaluate putting proposed text to Tier 2, Section 8.4 and/or in the ITP Section 14.2.	**Tier 2 Section 8.4 already has the relevant description as Attachment 1.** **Tier 2 section 14.2 will be changed as Attachment 3 in DCD revision 3.**	
4*	Generic	Determine what method(s) will be used to identify if additional changes are made between our draft products as provided to the NRC and Rev. 3.	**Along with DCD revision 3 and the change lists, MHI will send NRC staff the markup of the Tier 1 texts where wording is changed from the version presented at the NRC meeting.**	
5**	Section 2.6.6.5	US-APWR, Tier 2, Subsection 9.5.3.2.2.3 states that emergency lighting from 8-hour self-contained battery pack units is provided in all areas of the plant where emergency operations are performed, safe ingress and egress of personnel during emergencies are required, and during loss of normal lighting. Last sentence of Tier 1, Subsection 2.6.6.1 should be modified as "The self-contained battery pack emergency lighting system is provided in areas where	**The current Tier 1 wording (sent to the NRC) is: "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."** **The last phrase added by the comment "…and during loss of normal lighting" does not describe a location. The Tier 1 sentence is referring to locations in the plant where this system is installed.** **MHI would propose alternate wording as follows:**	

No	Tier 1 Section	Comment	Response	NOTES
		emergency operations are performed, safe ingress and egress of personnel are required and during loss of normal lighting."	**"The self-contained battery pack emergency lighting system is provided in areas where emergency operations are performed, and safe ingress and egress of personnel are required during emergencies".**	
6**	Section 2.6.6.5	US-APWR, Tier 2, Section 9.5.3.1 states that the emergency lighting fixtures in Class 1E equipment areas are mounted on seismic category I structures. Tier 1, Subsection 2.6.6.5 is not consistent with Tier 2. Tier 1, Subsection 2.6.6.5 should be revised to state that the emergency lighting system supports in the Class 1E equipment areas can withstand seismic design basis loads without loss of safety function.	**MHI agrees with the intent of the comment and revised the DD to read as follows:** **" Supports for the emergency lighting system fixtures powered by Class 1E power system can withstand seismic design basis loads without loss of safety function."**	
7**	Section 2.6.6.8	US-APWR, Tier 2, Subsection 9.5.3.2.2.1states that the Class 1E emergency lighting system provides at least 10 foot-candles of illumination. Tier 1, Subsection 2.6.6.8 should be revised to state that the emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles provided greater than or equal to 10 foot-candles for at least 8 hours.	**MHI agrees with comment and will revise the DD and DC to read as follows:** **"The emergency lighting powered by the Class 1E power system in the MCR and at the remote shutdown consoles provides equal to or greater than 10 foot-candles for at least 8 hours."**	
8**	Section 2.6.6.8	Items 5 and 8 of Table 2.6.6-1 should be revised based on comments 6 and 7.	**MHI agrees with changes in Items 5 and 8 of Table 2.6.6-1 based on comments 6 and 7.**	Original comment numbers are 2 and 3

No	Tier 1 Section	Comment	Response	NOTES
9**	Section 2.6.6.8	ITAAC related to seismic (Item 5 of Table 2.6.6-1) should be reviewed.	**Item 5 of Table 2.6.6-1 will be revised slightly to be consistent with the latest version of "generic ITAAC."** 5.ii Type tests, analysis, or a combination of type tests and analyses of the emergency lighting system supports in the MCR and remote shutdown console room will be performed using analytical assumptions, or will be performed under conditions, which bound the seismic design basis requirements.	

*: Comments at the meeting on January 20, 2011.

**: Comments after the meeting on January 20, 2011.

The AAC power system will be inspected and tested periodically to demonstrate operability and reliability. The reliability of the AAC power system will meet or exceed 95% as determined in accordance with NSAC-108 (Reference 8.4-2) or equivalent methodology to meet the Criterion 5 of Section C.3.3.5, RG 1.155 (Reference 8.3.1-21).

Procedures to cope with SBO are addressed in Section 13.5 and the training is addressed in Section 13.2. These include all operator actions necessary to cope with SBO for at least the duration in accordance with Subsection 8.4.2.1.1 and to restore normal long-term core cooling/decay heat removal once ac power is restored. This meets the requirement of Regulatory Position C.3.4 of RG 1.155.

The quality assurance of AAC GTG is controlled in accordance with DCD Chapter 17 and related topical report PQD-HD-19005 Revision 2 (Reference 8.4-3). This meets the requirements of Regulatory Position C.3.5 of RG 1.155.

8.4.3 Combined License Information

No additional information is required to be provided by a COL applicant in connection with this section.

8.4.4 References

8.4-1 Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors, NUMARC 87-00, Revision. 1, August 1991.

8.4-2 Reliability of Emergency Diesel Generators at U.S Nuclear Power Plants, NSAC-108, September 1986.

8.4-3 Quality Assurance Program (QAP) Description For Design Certification of the US-APWR, PQD-HD-19005 Revision 3, September 2009.

3. In offsite source available condition, load sequence is tested by initiating an ECCS actuation signal.

4. Each electrical division is operated independently of other divisions and division separation is verified in accordance with RG 1.41.

5. Verify all associated indications and alarms during test sequences.

D. Acceptance Criteria

1. The PSMS, the bus undervoltage relays, and the degraded voltage relays operate in accordance with design (see Subsection 8.3.1.1.3).

2. The loading intervals for supplying from Class 1E gas turbine generator are within the design limits.

3. Each train loads are sequenced on the bus by initiating of an ECCS actuation signal.

4. Each electrical division operates independently of other divisions.

5. All associated indications and alarms operate per design.

14.2.12.1.46 Alternate ac Power Sources for Station Black Out Preoperational Test

A. Objectives

1. Demonstrate the operability of each alternate ac power source breaker and associated interlocks.

2. Demonstrate the operation of air start and fuel systems.

3. Demonstrate the ability of the alternate ac power source to synchronize with the offsite power system.

4. Determine the fuel oil consumption of each alternate ac power source while operating under continuous rating load conditions.

5. Verify that, with the alternate ac power source operating in the test mode connected to its bus, an automatic start signal overrides the test mode by returning the alternate ac power source to standby operation.

B. Prerequisites

1. Required construction acceptance tests are completed.

2. Required electrical power supplies and control circuits are operational.

3. The alternate ac power source fuel oil system is available.

4. Adequate ventilation for the alternate ac power source area is available.

5. A report exists that demonstrates the reliability of the alternate ac power sources meets or exceeds 95% as determined in accordance with NSAC-108 (Reference 8.4-2) or equivalent methodology to meet the Criterion 5 of Section C.3.3.5, RG 1.155, based on historical data of the similar type of the ac alternate power sources.

C. Test Method

1. Fuel oil is transferred from the fuel oil storage tank to the fuel oil day tanks by means of the transfer pumps. Appropriate flow parameters are recorded.
2. The control logic of the alternate ac power source breaker, alternate ac power source start circuit, and support pumps and valves are verified.
3. The operability of the alternate ac power source starter is verified.
4. The alternate ac power source is started, voltage and frequency control demonstrated, phase rotation verified, and the backup generator synchronized to offsite power and loads.
5. During the testing, fuel oil consumption is monitored with the alternate ac power source operating at the continuous load rating.
6. With a simulated LOOP signal, the proper alternate ac power source trips is verified.
7. With the alternate ac power source connected to its bus, an automatic start signal causes it to return to standby operation.
8. Verify all associated indications and alarms during test sequences.

D. Acceptance Criteria

1. The controls, interlocks, and operation of the alternate ac power source breakers and support systems operate as designed (see Subsection 8.3.1.1.1).
2. Each alternate ac power source can be synchronized with offsite power.
3. Upon the receipt of automatic start signals, the alternate ac power sources operate as designed.
4. The alternate ac power source fuel oil consumption does not exceed the design requirements.
5. All associated indications and alarms operate per design.

14.2.12.1.47 125 V dc Class 1E Preoperational Test

A. Objectives

Attachment 3

Revised Wording of Section 2.6.4 Table 2.6.4-1 ITAAC #21.b

DC	ITA	AC
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.b Tests to measure the as-built Class 1E EPS FOS transfer pump suction pressure will be performed. Inspections and analysis to determine NPSH available to each Class 1E EPS FOS transfer pump will be performed. The analysis will consider vendor test results of required NPSH and the effects of: - pressure losses for pump inlet piping and components, - suction from the fuel oil storage tank fuel oil level at the minimum value	21.b A report exists and concludes that the as-built system NPSH available to each Class 1E EPS FOS transfer pump is greater than the NPSH required.