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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 16 - Technical Specifications
Application Section: 3.8 Electrical Power Systems

QUESTIONS for Technical Specification Branch (CTSB)

16-21

The following typographical and editorial errors were noted in Section 3.8:

TS 3.8.1, REQUIRED ACTION B.2, page 3.8.1-2
Add a space between the words "feature" and "in"...

TS 3.8.1, Bases, Background, page B 3.8.1-1
Fifth paragraph, second sentence: Within 3 minute after the initiating signal ... should be the plural minutes.

TS 3.8.1, Bases, ACTIONS B.2, page B 3.8.1-5
First paragraph, third and fourth sentences: change ... auxiliary feedwater ... to ... emergency feedwater ...

TS 3.8.1, Bases, ACTIONS B.2, page B 3.8.1-6
Second from the last paragraph, last sentence: the word ... Acceptable... does not need to be capitalized.

TS 3.8.9, CONDITION B, page 3.8.9-1
It looks like there are two spaces between the words more and required in CONDITION B. Only a single space is necessary.

TS 3.8.10, ACTIONS section, pages 3.8.10-1 and -2
It looks like there is an inadvertent < page break > in the ACTIONS section of TS 3.8.10 after the Note LCO 3.0.3 is not applicable on page 3.8.10-1 and the start of the CONDITION - REQUIRED ACTION - COMPLETION TIME table on page 3.8.10-2.

16-22

Correct or justify the inconsistency between the minimum voltage of 6762 V (98%) to be achieved by the Class 1E GTG within 100 seconds after starting in the 10-year simultaneous startup surveillance test SR 3.8.1.19, Requirement a., and the minimum voltage of 6210 V (90%) in the monthly surveillance test of SR 3.8.1.2.a.

The monthly individual Class 1E GTG startup surveillance test SR 3.8.1.2, Requirement a., establishes a minimum voltage of 6210 V (90%) as the value to be achieved within

100 second after starting. It would be expected that the 10-year SR value would be the same as the Monthly SR.

16-23

Justify the minimum fuel contained in the GTG day tank in SR 3.8.1.4 and the minimum run time. The minimum run time provided in the Bases is not stated to be based on the US-APWR accident analyses.

The Bases discussion for the US-APWR Class 1E GTG surveillance test SR 3.8.1.4 is identical to the STS NUREG-1431 TS 3.8.1 Bases discussion for SR 3.8.1.4 for the DG in that the calculated run time is 1 hour plus 10%. However, these are two different types of prime movers with unique operating characteristics in different applications and the minimum fuel requirement for the GTG day tank is 600 gallons compared to 220 gallons for the DG. The concern is that the accident analysis run time requirement for the US-APWR Class 1E GTG may be different than that for the DG in the STS NUREG-1431 TS 3.8.1. The accident analyses run time should be presented in terms of the US-APWR accident analyses and the corresponding minimum fuel requirement should be based on the minimum run time.

The US-APWR FSAR Section 8.3.1.1.3.9 states that the day tank capacity is adequate for 1.5 hours of operation of a Class 1E GTG at maximum required loading.

16-24

Justify the performance frequency of 24 months for the automatic and manual bus transfer surveillance test SR 3.8.1.7 compared to the performance frequency of 18 months for the STS NUREG-1431 SR 3.8.1.8. The justification used for the surveillance frequency of 18 months may not directly apply for the 24 months surveillance frequency.

The Bases discussions for these surveillance tests are identical except for citing 24 months versus 18 months as the basis for operating experience and engineering judgement to support the two different performance frequencies. There is minimal specific operating experience for Class 1E GTGs in nuclear power plant applications. The 24 months surveillance frequency is desired to be consistent with the expected fuel cycle length, but it should also be justified from a reliability standpoint. If engineering judgement is being used to extend to 24 months, based on operating experience with an 18 months surveillance frequency, then it should be so stated in the Bases and the basis for arriving at the engineering judgment should be explained.

16-25

Justify the maximum allowable startup time of 100 seconds for a US-APWR Class 1E GTG in order to support the assumptions made for the design basis accident analysis when the comparable DG maximum allowable startup time is 10 seconds in the DG startup surveillance test requirements for the STS NUREG-1431 TS 3.8.1, LCO 3.8.1.

The US-APWR TS 3.8.1, LCO 3.8.1 GTG surveillance test requirements SR 3.8.1.2, SR 3.8.1.14, and SR 3.8.1.19 require the GTG to start from a standby condition and achieve greater than 90% voltage at greater than 99% frequency within 100 seconds or less. The US-APWR TS 3.8.1, LCO 3.8.1 GTG surveillance test requirements SR 3.8.1.10, SR 3.8.1.11, and SR 3.8.1.18 require the GTG to start from a standby condition and pick up specified required loads within 100 seconds or less while maintaining steady state voltage between 98% and 102% of 6.9kV and frequency between 99% and 101% of 60Hz. The design basis accident analysis assumes the availability of class 1E ac power to supply power to safety system equipment and pumps so that they can perform their required safety function in accordance with a specified time line for the design basis accident scenario. The US-APWR DBA analysis must account for the longer startup time for the Class 1E GTGs to achieve 90% voltage and 99% frequency, compared to the STS NUREG-1431 DGs, that would result in a corresponding delay in the operation of safety-related system equipment and pumps to achieve their full rated capacity as assumed in the accident analysis.

16-26

Justify the absence of the required action equivalent to the required action in STS NUREG-1431 LCO 3.8.1 REQUIRED ACTION A.2 for the LCO 3.8.1 CONDITION A in the US-APWR TS,in order to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions associated with critical two-train safety loads. CONDITION A in STS NUREG-1431 TS 3.8.1, LCO 3.8.1, directs the licensee to perform REQUIRED ACTION A.1, the bus circuit breaker line-up verification surveillance SR 3.8.1.1 AND REQUIRED ACTION A.2 to "declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable."

Similarly, justify the absence of required action equivalent to the STS NUREG-1431 LCO 3.8.1 REQUIRED ACTION C.1 for the LCO 3.8.1 CONDITION C in the US-APWR TS in order to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions associated with critical two-train safety loads. CONDITION C in STS NUREG-1431 TS 3.8.1, LCO 3.8.1, directs the licensee to perform REQUIRED ACTION C.1 to "declare required feature(s) inoperable when its redundant required feature(s) is inoperable."

The FSAR Section 8.3.1.1.2.1, "System Redundancy," states that availability of power from any two of the four ac electric power trains is adequate to meet the load requirements. Each ac electric power train, supplied by one offsite power source and backed up by its associated dedicated Class 1E GTG, is adequate to satisfy the no single failure criterion. The FSAR Section 8.3.1.1.2.1, "System Redundancy," also states that there are two-train safety system loads, such as the motor-driven emergency feedwater pumps, and two-train loads distributed on Class 1E 480Vac bus A1, which can be backed up by manual alignment to Train B, and Class 1E 480Vac bus D1, which can be backed up by manual alignment to Train C. It appears that with neither of the offsite power sources available, a coincident single failure could potentially result in complete loss of redundant required safety functions in two-train safety loads. A TS REQUIRED ACTION to check for inoperable redundant safety features would address this potential vulnerability with two offsite circuits inoperable.

16-27

Justify the performance frequency of 24 months for the US-APWR Class 1E GTG refueling cycle surveillance tests SR 3.8.1.8 through SR 3.8.1.18 compared to 18 months for the equivalent STS NUREG-1431 DG surveillance tests SR 3.8.1.7 and SR 3.8.1.9 through SR 3.8.1.19. The industry operating experience with DGs may not directly translate over for GTGs and additional justification is needed.

The Bases discussions for these surveillance test requirements cite RG 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used As Class 1E Onsite Electric Power Systems At Nuclear Power Plants," as the basis for the performance frequency. The concern is that there is minimal specific operating experience for Class 1E GTGs in nuclear power plant applications. Non-nuclear gas turbine generator operating experience must be factored in with plant risk considerations if the TS surveillance requirements frequencies are to be extended to coincide with a projected refueling cycle of 24 months in the US-APWR. DG operating experience in nuclear power plant applications may not translate over for Class 1E GTGs in this application.

16-28

Provide further details in the Bases discussion for US-APWR TS 3.8.1 CONDITION C when the plant is operating in MODE 1, 2, 3, or 4 with none of the two required qualified offsite circuits available and is performing REQUIRED ACTION C.1 to restore one of the inoperable circuits. Clarify the start of the COMPLETION TIME clock for restoration of the remaining required offsite circuit to OPERABLE status and provide the required COMPLETION TIME for restoration of the remaining offsite power source. Describe the administrative controls that may be used to limit the maximum time allowed for any combination of conditions that result in a single contiguous occurrence of failure to meet the LCO 3.8.1.a.

The Bases discussion for REQUIRED ACTIONS C.1 AND C.2 for US-APWR TS 3.8.1 CONDITION C (No required offsite circuits OPERABLE) indicates that the unit may continue to operate for up to 24 hours to allow restoration of one required offsite circuit to OPERABLE status. The last sentence in the second from the last paragraph of the Bases discussion states that if only one offsite source is restored within 24 hours, power operation continues in accordance with CONDITION A. CONDITION A allows the licensee 72 hours to restore one inoperable required offsite circuit to OPERABLE status. Without any administrative controls to limit the maximum time allowed, the plant may conceivably continue to operate with one offsite circuit inoperable for an unlimited time.

16-29

Provide further details in the Bases discussion for REQUIRED ACTIONS C.1 AND C.2 for US-APWR TS 3.8.1 CONDITION C (Two required offsite circuits inoperable) about continuing to operate the unit for up to 24 hours to allow restoration of one required offsite circuit to OPERABLE status. The discussion provided in the Bases does not address all of the relevant scenarios.

Discuss the scenarios that could lead to two required offsite circuits inoperable while the plant continues to operate, for the plant ac electrical distribution system response to the LOOP, and for the configuration of the ac electric power system supply to the Class 1E 6.9kV buses if it is decided to continue operation during the period of up to 24 hours, until one required offsite circuit is restored to OPERABLE status. Your response should address LOOP scenarios resulting in automatic fast bus transfer and automatic slow bus transfer, the resulting status of the Class 1E GTGs and their output circuit breakers, whether the main generator is continuing to supply power to the safety loads through the UATs, whether transmission lines other than the two qualified offsite ac circuits remain connected to the plant switchyard, and the status of the UATs and RATs.

16-30

Justify the COMPLETION TIME of 2 hours in the US-APWR TS 3.8.1, LCO 3.8.1 ACTIONS CONDITION E, when 3 required GTGs are inoperable.

RG 1.93, Regulatory Position C.4 states that if the available onsite ac electric supplies are two less than the LCO requires, power operation may continue for a period that should not exceed two hours. However, when 3 required GTGs are inoperable, the plant is operating with three less than the LCO 3.8.1.b requirement for 3 Class 1E GTGs. This case is, therefore, more similar to US-APWR TS 3.8.1, LCO 3.8.1 ACTIONS CONDITION H where you have various simultaneous inoperable combinations of offsite power sources and onsite GTGs that amount to three or more ac sources less than the normal five ac sources (2 of 2 offsite power sources and 3 of 4 GTGs) required by the LCO. The COMPLETION TIME for CONDITION H is to immediately enter LCO 3.0.3.

16-31

Clarify whether the intent of the TS 3.8.1, LCO 3.8.1, Item c, is to require OPERABLE automatic load sequencers for all four Class 1E ac power safety trains since their function can also affect offsite circuits or, OPERABLE automatic load sequencers for only those Class 1E ac power safety trains that are backed up by OPERABLE Class 1E GTGs.

Discuss whether a Class 1E bus can remain OPERABLE when its corresponding automatic load sequencer becomes inoperable. Section 8.3.1.2.4 of the DCD describes the various combinations of manual and automatic interconnections between the Class 1E buses, offsite ac sources, and Class 1E GTGs and the electrical distribution system's automatic load shedding and load sequencing responses to different plant operating contingencies, such as LOCA with offsite power available or simultaneous LOOP/LOCA. Also discuss the completeness of the TS requirements for automatic load sequencers regarding the different plant operating contingencies.

16-32

Confirm that the CONDITION F under the US-APWR TS 3.8.1, LCO 3.8.1 ACTIONS is intended to include the CONDITION where the plant is operating in MODE 1, 2, 3, or 4

with more than one automatic load sequencer inoperable. Justify using only one CONDITION with one COMPLETION TIME to address the automatic load sequencers.

This potential operating condition does not appear to be specifically addressed in the US-APWR TS 3.8.1, LCO 3.8.1 as it is presently written, because the US-APWR plant ac electrical design consists of two offsite circuits and three of four onsite safety buses backed up by a dedicated GTG on each bus, whereas the model for this TS, the STS NUREG-1431 TS 3.8.1, LCO 3.8.1, is based on a standard plant design with two offsite circuits and two onsite safety buses backed up by a dedicated diesel generator on each bus. If this represents a CONDITION not previously covered, REQUIRED ACTIONS would need to be developed to assure availability of ac electric power to redundant Class 1E electrical trains and redundant safety features and to restore the required inoperable automatic load sequencers to OPERABLE status within specified COMPLETION TIMES.

If the CONDITION of more than one automatic load sequencer inoperable is covered by CONDITION F, then justify specifying the same COMPLETION TIME for one or more inoperable automatic load sequencers.

16-33

Confirm that CONDITION B under the US-APWR TS 3.8.2, LCO 3.8.2 ACTIONS is intended to include the CONDITION for the plant is operating in MODE 5 or 6 when both of the two required Class 1E GTGs become inoperable during shutdown.

This potential operating condition does not appear to be specifically addressed in the US-APWR TS 3.8.2, LCO 3.8.2 as it is presently written, because the US-APWR plant ac electrical design consists of two offsite circuits and three of four onsite safety buses backed up by a dedicated GTG on each bus, whereas the model for this TS, the STS NUREG-1431 TS 3.8.1, LCO 3.8.1, is based on a standard plant design with two offsite circuits and two onsite safety buses backed up by a dedicated diesel generator on each bus. Condition B would address the case where two required Class 1E GTGs become inoperable during shutdown if it was worded (One or more required Class 1E GTGs inoperable.) This would also be consistent with the wording used for CONDITION A in TS 3.8.10, Distribution Systems - Shutdown.

16-34

Justify the difference in the minimum current limit (greater than or equal to 400 A) supplied by the battery charger at greater than or equal to the minimum established float voltage for at least 8 hours cited in US-APWR TS 3.8.4 surveillance test requirement SR 3.8.4.2 compared to the minimum current limit cited in STS NUREG-1431 TS 3.8.4 SR 3.8.4.2 (greater than or equal to 800 A).

The Bases discussion for the US-APWR SR 3.8.4.2 is nearly identical to the Bases discussion for STS NUREG-1431 SR 3.8.4.2 except for the battery charger minimum current limit.

The response to RAI 3.8.4-3 regarding the determination of the minimum established float voltage also affects acceptance criteria for SR 3.8.4.2.

16-35

Describe the determination methodology and administrative control for the minimum established float voltage, for the Class 1E battery as an acceptance criterion for US-APWR TS 3.8.4 surveillance test requirement SR 3.8.4.1. It is also referred to in TS 3.8.4 REQUIRED ACTION A.1, TS 3.8.4 surveillance test requirement SR 3.8.4.2, and TS 3.8.5 REQUIRED ACTION A.1, but no quantitative voltage value is specified directly.

The Bases discussion for the US-APWR indicates a manufacturer's suggested minimum of 2.17 V per cell and 130.2 V at the battery terminals, indicating a 60-cell battery. The Bases discussion for the STS NUREG-1431 SR 3.8.4.1 is nearly identical except for a different manufacturer's suggested minimum of 2.20 V per cell and 127.6 V at the battery terminals, indicating a 58-cell battery. The description of the Class 1E batteries in FSAR Section 3.8.3.1.1 states the design basis minimum of 1.8 V per cell end voltage with a minimum battery terminal voltage of 108 V at 65oF and 25% aging factor. Your response should discuss the basis for the difference in the battery size, how the minimum float voltage will be determined and administratively controlled, and whether the value will be verified by test for each Class 1E battery.

US-APWR TS 3.8.5 surveillance test requirement SR 3.8.5.1 directs the licensee to perform SR 3.8.4.1 to verify shutdown operability of the Class 1E battery.

16-36

Justify not including a CONDITION under TS 3.8.4, LCO 3.8.4 ACTIONS specifically addressing the case where the plant is operating in MODE 1, 2, 3, or 4 when two or more required dc electrical power subsystems become inoperable.

This potential operating condition does not appear to be specifically addressed in the US-APWR TS 3.8.4, LCO 3.8.4 as it is presently written. TS 3.8.9, LCO 3.8.9 ACTIONS CONDITION C states that with "one or more required dc electrical power subsystems inoperable" the licensee must complete REQUIRED ACTION C.1 within 2 hours. This is consistent with the 2 hours COMPLETION TIME for TS 3.8.4, LCO 3.8.4 ACTIONS CONDITION C. However, TS 3.8.9, LCO 3.8.9 ACTIONS CONDITION E states that with "two or more required electrical power subsystems inoperable that result in a loss of safety function" the licensee must immediately enter LCO 3.0.3 (REQUIRED ACTION E.1). TS 3.8.4, LCO 3.8.4 does not provide guidance consistent with TS 3.8.9, LCO 3.8.9 ACTIONS CONDITION E for the case when two or more required dc electrical power subsystems become inoperable.

TS 3.8.9, LCO 3.8.9 ACTIONS CONDITION C indicates that it is acceptable for the plant to continue to operate for up to two hours with two of the three required dc electrical subsystems until an inoperable dc electrical subsystem is restored to OPERABLE status. Justify operating the plant for up to two hours with only one of the three required dc electrical subsystems OPERABLE, or none of the three required dc electrical subsystems OPERABLE. Also confirm an associated dc electrical bus is considered

inoperable when the plant enters TS 3.8.4, LCO 3.8.4 CONDITION A alone, CONDITION B alone, or CONDITION A and CONDITION B simultaneously.

16-37

Justify the difference between the US-APWR Technical Specifications Class 1E battery float current limit of 5 A and its corresponding verification COMPLETION TIME of once per 24 hours and the STS NUREG-1431 float current limit of 2 A and corresponding COMPLETION TIME of once per 12 hours.

This difference affects the following: US-APWR TS 3.8.4, LCO 3.8.4, REQUIRED ACTION A.2; TS 3.8.5, LCO 3.8.5, REQUIRED ACTION A.2; and TS 3.8.6, LCO 3.8.6, CONDITION B and REQUIRED ACTION B.2. The Bases discussions for these operating and shutdown conditions for the US-APWR and the STS NUREG-1431 are identical except for the above values.

The difference in the battery float current limit indicated above (5 A cited in the US-APWR compared to 2 A cited in the STS NUREG-1431) also affects TS 3.8.6 CONDITION F and surveillance test requirement SR 3.8.6.1.

16-38

Provide the methodology and administrative control for the manufacturer's rating of the battery capacity as an acceptance criterion for the TS 3.8.6 battery capacity surveillance test requirement SR 3.8.6.6. Also, describe the establishment of the manufacturer’s rating for battery capacity and expected life including the "battery degradation" determination and the administrative controlls necessary to set the performance FREQUENCY for the TS 3.8.6 battery capacity surveillance test requirement SR 3.8.6.6.

The TS 3.8.6 SR 3.8.6.6 Bases discussion indicates that the IEEE Std. 450 definition of battery degradation will be used. Discuss the use this standard as guidance for implementation.

16-39

Justify the individual cell and battery terminal voltage values suggested in the Bases discussion for TS 3.8.6 surveillance test requirements SR 3.8.6.2 and 3.8.6.5 on page B.3.8.6-6.

As presently written in the Bases, the values suggested for individual cell voltage and battery terminal voltage for the US-APWR are the same as for the STS NUREG-1431. However, at least the battery terminal voltage value should be different because, as noted in RAI 3.8.4-3, the US-APWR battery is comprised of 60 cells compared to the STS NUREG-1431 battery that is comprised of 58 cells.

16-40

Describe the determination and administrative control of the minimum established design limits and battery parameters limits referred to in TS 3.8.6 CONDITIONS C, D, E, and indirectly, F, and in surveillance test requirements SR 3.8.6.3 and SR 3.8.6.4.

16-41

Justify the monthly frequency for the GTG fuel oil inventory surveillance check SR 3.8.3.1 to assure that the TS 3.8.3, LCO 3.8.3 is satisfied.

The REQUIRED ACTION for CONDITION A directs the licensee to restore the fuel oil inventory to greater than the 91,000 gallons storage tank level within a COMPLETION TIME of 48 hours if the fuel inventory has dropped to a storage tank level equivalent to between 78,000 gallons and 91,000 gallons of fuel. An inventory of 78,000 gallons is estimated to allow the GTG to operate at DBA loading for at least six days. A frequency of once per week with a safety-related level indicating instrument and/or a low fuel oil storage tank level alarm may be appropriate for SR 3.8.3.1 to assure that the TS LCO 3.8.3 and the REQUIRED ACTION for CONDITION A are satisfied. In your response describe administrative controls that would be used to assure that Class 1E GTG fuel oil storage tank inventory is restored in accordance with the TS LCO 3.8.3 following any operation of a gas turbine, including maintenance and testing runs.

16-42

Justify the monthly frequency for the GTG lube oil inventory surveillance check SR 3.8.3.2 to assure that the TS 3.8.3, LCO 3.8.3 is satisfied.

The REQUIRED ACTION for CONDITION B directs the licensee to restore the lube oil inventory to greater than 81 gallons within a COMPLETION TIME of 48 hours if the inventory has dropped to between 79 and 81 gallons. An inventory of 79 gallons is estimated to allow the GTG to operate at DBA loading for at least six days. A frequency of once per week with a safety-related level indicating instrument and/or a low lube oil level alarm may be appropriate for SR 3.8.3.2 to assure that the TS LCO 3.8.3 and the REQUIRED ACTION for CONDITION B are satisfied.

16-43

Justify that the Class 1E GTG starting air receiver pressure values specified in TS 3.8.3, CONDITION E, i.e. less than 270 psig and greater than or equal to 185 psig, provides enough capacity for at least one start cycle and the starting air receiver pressure greater than 270 psig specified in SR 3.8.3.4 provides enough capacity for at least three start cycles.

The FSAR Section 9.5.6, describing the GTG starting air system, indicates that there are six compressors supplying two air start receivers for each Class 1E GTG. The air compressors cycle the starting air receiver pressure between the minimum setpoint of 384 psia to the maximum of 435 psia. The concern is that the TS and SR may not be

reflecting the design parameters of the GTG starting air system as described in FSAR Section 9.5.6.

16-44

Justify not including a CONDITION under TS 3.8.7, LCO 3.8.7 ACTIONS specifically addressing the case where the plant is operating in MODE 1, 2, 3, or 4 when two or more required inverters become inoperable.

This potential operating condition does not appear to be specifically addressed completely in the US-APWR TS 3.8.7, LCO 3.8.7 as it is presently written. TS 3.8.7, LCO 3.8.7 ACTIONS CONDITION A states that with one of the three required inverters inoperable the licensee is required to restore the inverter to OPERABLE status within 24 hours. However, no specific guidance is provided for the cases where two of three required inverters become inoperable or all three of the required inverters become inoperable.

TS 3.8.9, LCO 3.8.9 ACTIONS CONDITION B states that with "one or more required ac vital buses inoperable" the licensee must complete REQUIRED ACTION B.1 within 2 hours. However, neither TS 3.8.7, LCO 3.8.7 nor TS 3.8.9, LCO 3.8.9 specifically address the effect of inverter operability on the operability of an associated ac vital bus. Confirm that an ac vital bus is considered inoperable if its associated inverter is inoperable.

16-45

Specify and describe the administrative controll of the the "correct inverter voltage, frequency, and alignments to required ac vital buses" as the acceptance criteria for the TS 3.8.7 inverter surveillance test requirement SR 3.8.7.1 and the TS 3.8.8 inverter surveillance test requirement SR 3.8.8.1.

16-46

Correct the inconsistency with TS 3.8.9 Table 3.8.9-1 indicating that four of four trains of the ac vital buses are required OPERABLE when the plant is operating in MODES 1, 2, 3, or 4, but TS 3.8.7, LCO 3.8.7 requires inverters in only three trains to be OPERABLE.

Neither TS 3.8.7, LCO 3.8.7 nor TS 3.8.9, LCO 3.8.9 specifically address how inverter operability affects the operability of an associated ac vital bus. Confirm if an ac vital bus is considered inoperable if its associated inverter is inoperable. Based on this discussion, justify the success requirements in Table 3.8.9-1 and the inverter operability requirements in LCO 3.8.7.

16-47

For TS 3.8.10, LCO 3.8.10, specify and describe the administrative controll of the necessary portions of ac, dc, and ac vital bus electrical power distribution subsystems...to support equipment required to be OPERABLE.

Discuss the definition of the necessary portions of the ac, dc, and ac vital bus for the plant operating in MODE 5 or 6 during the movement of irradiated fuel assemblies. The discussion should also specify and describe the administrative controll for the inverters required for the plant operating in MODE 5 or 6 during the movement of irradiated fuel assemblies in accordance with TS 3.8.8, LCO 3.8.8.