



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

June 17, 2010
U7-C-STP-NRC-100137

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Request for Additional Information

- References:
1. Letter, Scott Head to Document Control Desk, "Response to Requests for Additional Information," dated May 3, 2010, U7-C-STP-NRC-100097
 2. Letter, Scott Head to Document Control Desk, "Responses to Requests for Additional Information," dated July 22, 2009, U7-C-STP-NRC-090071

Attached is a supplement to the South Texas Project Nuclear Operating Company (STPNOC) response to Request for Additional Information (RAI) question 08.03.01-4, which was submitted in Reference 1. This supplement documents the STPNOC responses to questions that were posed by the NRC staff during a teleconference on May 19, 2010. Also attached is a revised response to RAI question 08.03.01-6, which corrects a typographical error in the original response provided in Reference 2. Attachments 1 and 2 provide the following RAI responses:

08.03.01-4, Supplement 3 08.03.01-6, Revision 1

When a change to the COLA is indicated, it will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions, please contact me at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

DO91
MRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 6/17/10



Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

rhb

- Attachments: 1. RAI 08.03.01-4, Supplement 3
2. RAI 08.03.01-6, Revision 1

cc: w/o attachments and enclosure except*
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08.03.01-4, Supplement 3

QUESTION:

RAI 08.03.01-4, Supplement 2, revised COLA Rev 3 to include the transfer capability of the Fine Motion Control Rod Drive (FMCRD) power supply from Div 1 Class 1E to a Plant Investment Protection (PIP) bus on loss of power to the Div 1 Class 1E bus. During a teleconference on Wednesday, May 19, STPNOC agreed to revise RAI 08.03.01-4, Supplement 2, to address four questions consistent with the answers provided during the call.

RESPONSE:

The following address the NRC questions posed during a teleconference with the NRC and STPNOC on May 19, 2010:

- 1a. After the FMCRD power supply transfers from the Class 1E bus to the PIP bus, the transfer back from PIP bus power to Class 1E bus power is manual. FSAR 8.3.1.1.1 will be revised to include this information.
- 1b. During loss of voltage or degraded voltage conditions on the Class 1E bus, the FMCRD power supply will transfer to the PIP bus if the PIP bus is available. If the PIP bus is not available, the FMCRD power supply will be re-energized when the Class 1E bus is re-energized by the emergency diesel generator as shown in FSAR Table 8.3-1 and 8.3-4.
2. The statement, "The Division I Class 1E medium voltage bus can be manually connected directly to a non-safety bus as an alternate collective source of power for the FMCRD load groups or the FMCRD power distribution panels can be connected directly to a PIP bus," will be deleted from FSAR 8.3.1.1.1.
3. FSAR Figure 8.3-1, Sheet 4, shows feeds from Power Center E10 to the FMCRD Power Distribution Panels. These figures show there are two isolation devices in series for the feeds from Power Center E10 to the FMCRD Power Distribution Panels.
4. FSAR 8.3.1.1.1 will be revised to include a reference to Regulatory Guide 1.75.

The following proposed FSAR changes replace the FSAR changes proposed in RAI 08.03.01-4, Supplement 2, in their entirety. Changes between Supplement 2 and Supplement 3 are marked with change bars in the right margin. These changes will be made in a future COLA revision. There were no changes made to Figure 8.3-1 between Supplement 2 and Supplement 3.

FSAR 7.4.2.1.2 Specific Regulatory Requirements Conformance

STD DEP 1.8-1

STD DEP 7.4-1

STD DEP 8.3-1

There are three separate groups of non-1E drives with each receiving power from Division I Class 1E bus. Class 1E circuit breakers are used as isolation devices in accordance with IEEE-384. The breakers are designed to trip on fault current only and are not tripped for LOCA. However, the breaker coordination is assured through the use of zone selective interlocks (ZSI) (Subsection 8.3.1.1.1).

The ZSI feature circuit protection coordination and testing of breakers assures that the FMCRDs power breaker time-overcurrent trip characteristic for all circuit faults shall cause the breaker to interrupt the fault current prior to trip initiation of any upstream breaker. The power source shall supply the necessary fault current for sufficient time to ensure the proper coordination without loss of function of Class 1E loads. The ZSI is a new technology which assures breaker coordination, and thus meets the intent of position C 1 of Reg. Guide 1.75.

FSAR 8.3.1.1.1 Medium Voltage Class 1E Power Distribution System

STD DEP 8.3-1

The load breakers in the Division I switchgear are part of the isolation scheme between the Class 1E power and the non-Class 1E load. In addition to the normal over-current tripping of these load breakers, Class 1E zone selective interlocking is provided between them and the upstream Class 1E bus feed breakers.

The fault interrupt capability of all Class 1E breakers, fault interrupt coordination between the supply and load breakers for each Class 1E load and the Division I non-Class 1E load, and the zone selective interlock feature of the breaker for the non-Class 1E load all have the capability of being tested (Subsection 8.3.4.29). The zone selective interlock is a feature of the trip unit for the breaker and is tested when the other features such as current setting and long time delay are tested.

FSAR 8.3.1.1.1

STD DEP 8.3-1

Standby AC power for Class 1E buses is supplied by diesel generators at 6.9 4.16 kV and distributed by the Class 1E power distribution system. Division I, II and III buses are automatically transferred to the diesel generators when the preferred power supply to these buses is $\leq 70\%$ bus voltage.

Power is supplied to each FMCRD load group from either either the Division I Class 1E bus or a non-Class 1E PIP bus through a non-Class 1E automatic transfer switch located between the power sources and the 480V FMCRD power distribution panels.

Switchover to the non-Class 1E PIP bus source is automatic on loss of power from the Class 1E diesel bus source, or the non-Class 1E PIP bus through a pair of interlocked transfer switches located between the power sources and the 6.9 kV/480V transformer feeding the FMCRD MCC. These transfer switches are classified as associated, and are treated as Class 1E. Switchover to the non-Class 1E PIP bus source is automatic on loss of power from the Class 1E diesel bus source. Switching back to the Class 1E diesel bus power is by manual action only. Switchover to the non-Class 1E PIP bus source is automatic on loss of power from the Class 1E diesel bus source. Switching back to the Class 1E diesel bus power is by manual action only. The Division 1 Class 1E bus can be manually connected to a non-safety bus as an alternate collective source of power for the Fine Motion Control Rod Drive (FMCRD) load groups. Per IEEE-384 and Regulatory Guide 1.75, isolation between the Class 1E bus and non-1E load is maintained.

The design minimizes the probability of a single failure affecting more than one FMCRD group by providing six-three independent Class 1E feeds (two-one for each group) directly from the Division 1 Class 1E 6.9 4.16 and PIP 480 kV buses (see sheet 3 sheet 3 and 4 of Figure 8.3-1).

The two Class 1E protective devices connected in series provide isolation between the Class 1E bus and non-Class 1E load. The transfer switches are non-Class 1E. The feeder circuits from the non-Class 1E PIP bus to the transfer switch, and circuits downstream of the transfer switch, are non-Class 1E. The Class 1E load breakers in conjunction with the zone selective interlocking feature (which is also Class 1E), provide the needed isolation between the Class 1E bus and the non-Class 1E loads. The feeder circuits on the upstream side of the Class 1E load breakers are Class 1E. The FMCRD circuits on the load side of the Class 1E load breakers down to and including the transfer switches are associated. Control power for the transfer switches is provided from Division 1. The feeder circuits from the non-Class 1E PIP bus to the transfer switch, and circuits downstream of the transfer switch, are non-Class 1E.

FSAR Section 8.3.1.2(2)(f): Regulatory Guides Analysis

Regarding Position C-1 of Regulatory Guide 1.75 (Subsection 8.3.1.1.1), the non-Class 1E FMCRD motors are supplied power from the Division 1 Class 1E bus through three dedicated power center transformers. The Class 1E load breakers or protective devices connected in series for the bus are is tripped by fault current for faults in the non-Class 1E load prior to initiation of a trip of upstream breakers. There is also a zone selective interlock provided from the load breaker to the Class 1E bus supply breaker so that the supply breaker is delayed from tripping while fault current is flowing in the non-Class 1E load feeder. This meets the intent of the Regulatory Guide position in that the main supply breaker is prevented from tripping on faults in the non-safety related loads. The transfer switch downstream of the load feeder is associated, and meets Class 1E requirements.

FSAR 8.3.3.5.1 Power, Instrumentation and Control Systems

NOTE: Associated lighting circuits are described in Section 9.5.3 and associated Fine Motion Control Rod Drive (FMCRD) circuits are described in Section 8.3.1.1.1. Any other associated circuits added beyond those described above must be specifically identified and justified. Associated circuits are defined in Section 5.5.1 of IEEE-384, with the clarification for Items (3) and (4) that non-Class 1E circuits being in an enclosed raceway without the required physical separation or barriers between the enclosed raceway and the Class 1E or associated cables makes the circuits (related to the non-Class 1E cable in the enclosed raceway) associated circuits.

FSAR 8.3.3.6.2.2.4 Isolation Devices

Where electrical interfaces between Class 1E and non-Class 1E circuits or between Class 1E circuits of different divisions cannot be avoided, Class 1E isolation devices will be used. AC isolation (the FMCRD drives on Division 1 is the only case) is provided by Class 1E interlocked circuit breaker coordination as described in Subsection 8.3.1.1.1.

FSAR 8.3.4.29 Periodic Testing of Class 1E Circuit Breakers

This subsection of the ABWR DCD is replaced in its entirety with the following site specific supplement which addresses COL License Information Item 8.35.

Procedure(s) for the periodic calibration and functional testing of the fault interrupt capability of all Class 1E breakers; the fault interrupt coordination between supply and load breakers for each Class 1E load and each Division I non-Class 1E load, and each zone selective interlock feature of the breaker for each non-Class 1E load, will be developed prior to fuel load. These procedures will be developed consistent with the plant operating procedure development plan in Section 13.5. (COM 8.3-18)

STD DEP 8.3-1 (FSAR Table 9A.6-2)

FSAR Table 9A.6-2 Fire Hazard Analysis
Equipment Database Sorted by Room — Reactor Building (Continued)

Item No.	MPL No	Elect Div.	Elev. Location	Location Number Coord.	Location Alpha Coord.	Description	System Drawing	Room No.
2471	R23-P/C-EN110A	N1	23500	1.5	A-5	P/C-EN110A-LO-VOLT SWTGR	107E5072/0	640
2472	R23-P/C-EN110B	N2	23500	1.2	A-5	P/C-EN110A-LO-VOLT SWTGR	107E5072/0	640
2473	R23-P/C-EN110C	N3	23500	1.2	A-2	P/C-EN110C-LO-VOLT SWTGR	107E5072/0	640
2475	R24-MCC-EN110A	N1	23500	1.3	B-5	MCC-EN110A-R/B	107E5072/0	640
2475a	R24-MCC-EN110B	N2	23500	1.3	B-6	MCC-EN110B-R/B	107E5072/0	640
2476	R24-MCC-EN110C	N3	23500	1.3	B-7	MCC-EN110C-R/B	107E5072/0	640

FSAR Section 19B.2.9 A-25, Non-Safety Loads on Class 1E Power Sources

STD DEP 8.3-1

The load breakers in the Division 1 bus Class 1E load breakers in the switchgear are part of the isolation scheme between the Class 1E power and the non-Class 1E FMCRD loads. In addition to the normal overcurrent tripping of these load breakers, zone selective interlocking (ZSI) is provided between them and the upstream Class 1E bus feed breakers. The Class 1E load breakers, in conjunction with the ZSI feature, provides the needed isolation between the Class 1E bus and the non-Class 1E loads. (See Subsection 8.3.1.1.1 for more details on this feature relative to the FMCRD power circuits.)

FSAR Part 7, Departures Report, Section 2.2

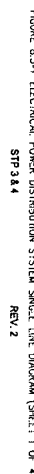
STD DEP 8.3-1, Plant Medium Voltage Electrical System Design

The capability to power the FMCRDs directly from a PIP bus and the direct transfer capability is changed to occur at the 480 volt level. These changes are reflected in FSAR Sections 8.3.1.1.1, Figures 8.3-1, Sheet 1, 3 and 4 and FSAR Table 9A.6-2 Fire Hazard Analysis.

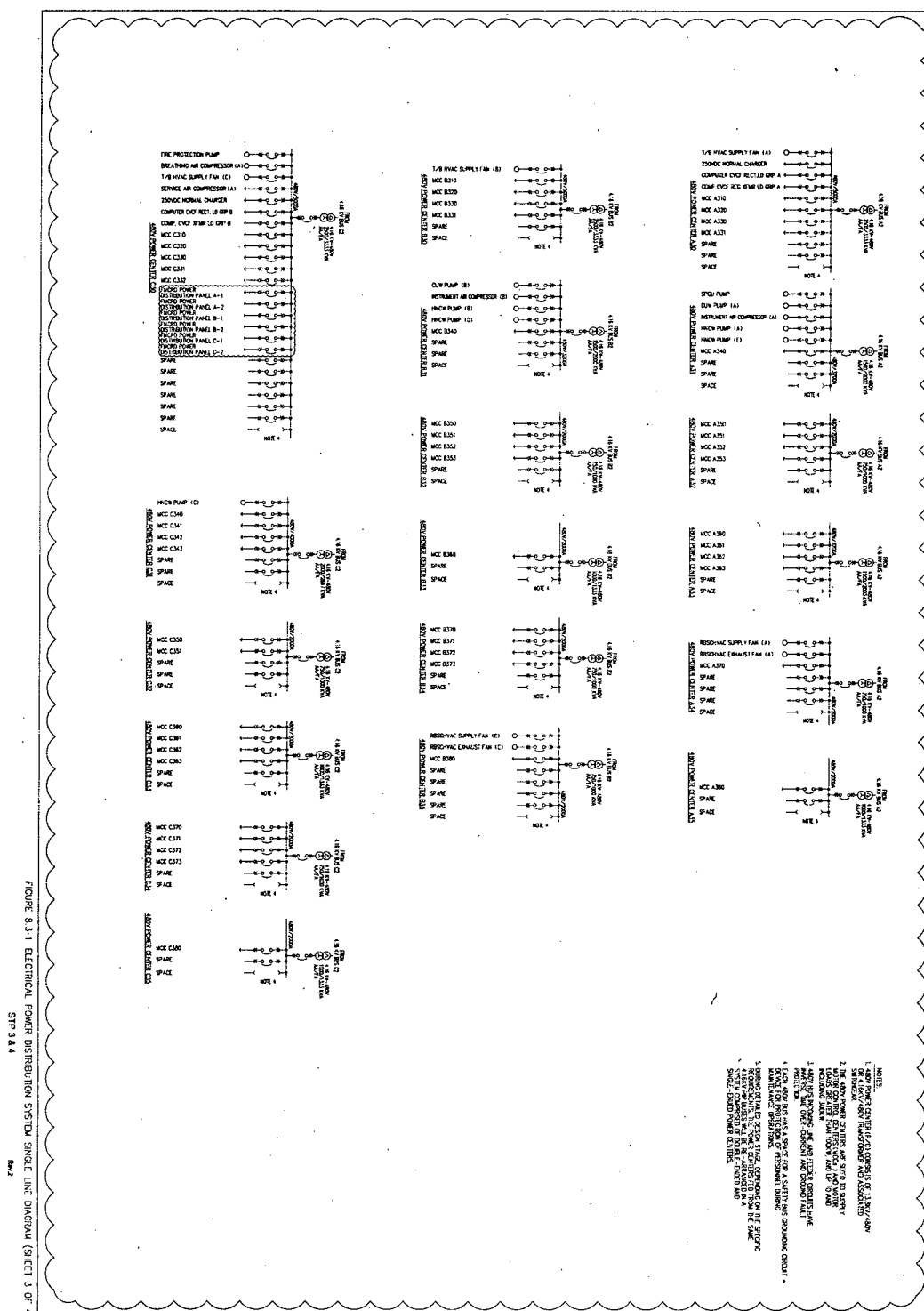
Power supplies to the FMCRD power distribution panels A-1, A-2, B-1, B-2, C-1 and C-2 and transfer switches have been re-classified as non-Class 1E. This change requires revisions to FSAR sections 7.4.2.1.2, 8.3.1.1.1, 8.3.1.2(2)(f), and 8.3.3.5.1, 8.3.3.6.2.2.4 and 8.3.4.29.

Isolation between Class 1E bus and non-Class 1E FMCRD loads is provided by two Class 1E protective devices in series. The Class 1E breaker trip prior to upstream breaker trip is assured by circuit protection coordination and testing of breakers. The zone selective interlock feature requirement is removed. This change requires revision to FSAR sections 7.4.2.1.2, 8.3.1.1.1, 8.3.1.2(2)(f), 8.3.4.29 and 19B.2.9 A-25.

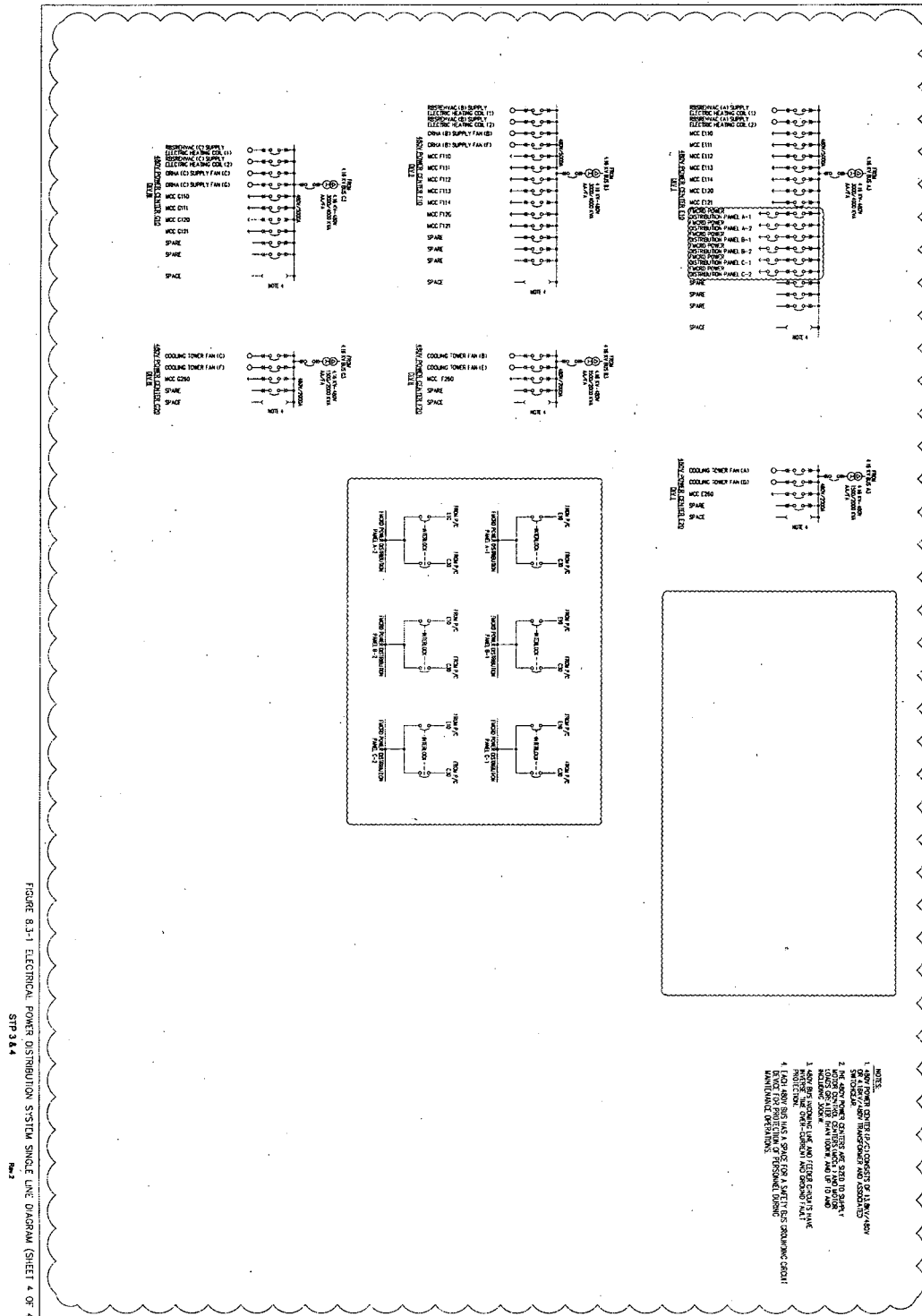
FSAR Ch. 21 Figure 8.3-1 Sheet 1



FSAR Ch. 21 Figure 8.3-1 Sheet 3



FSAR Ch. 21 Figure 8.3-1 Sheet 4



08.03.01-6, Revision 1

QUESTION:

FSAR subsection 8.3.1.1.1 describes the medium voltage Class 1E power distribution system. Explain why various bus ratings identified in the corresponding section of the ABWR DCD have been deleted.

REVISED RESPONSE:

This RAI revision is to correct a typographical error. The breaker interrupting current rating of 61 kA shown in the original response should be 63 kA. This breaker rating does not appear in the FSAR; the following revised response corrects the typographical error with no other changes.

Various ratings were removed from subsection 8.3.1.1.1 since the Class 1E medium voltage system changed to a 4.16 kV system from the values stated in the DCD. The bus continuous current rating of 2000A is identified in Figure 8.3-1 Sheet 1. The Class 1E power distribution system equipment has not yet been procured; therefore actual equipment ratings cannot be specified in the FSAR or figures. Based on the initial system sizing calculations, the Class 1E medium voltage bus and circuit breaker ratings have been selected as 4.76 kV, continuous current rating per Figure 8.3-1, interrupting current rating of 63 kA and momentary current rating of 164 kA.

DCD Tier 1 Inspections, Tests, Analyses and Acceptance Criteria 2.12.9a will verify ratings.

No COLA revision is required as a result of this RAI response.