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June 6, 2002

Mr. R. Mullikin
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, Texas

Reference: Triennial Fire Protection Baseline Inspection, South Texas Project Units 1 and 2.
Inspection Report Nos.: 50-498/02-03 and 50-499/02-03

Dear Mr. Mullikin:

The enclosed technical letter report (TLR) describes the results of my activities during the Triennial Fire Protection Baseline Inspection performed at Units 1 and 2 of the South Texas Project . Due to the similarity in design between units, inspection efforts focused on an assessment of the adequacy of fire protection features provided for the following five fire areas of Unit No. 1: Fire Area 1, 2, 3, 7 and 31

As described in the Inspection Plan, my primary area of responsibility was to provide technical assistance in an assessment of the adequacy of the licensee's Post-fire Safe Shutdown Circuit Analysis.

As you are aware, the following two deficiencies were identified during my review: (1) Implementation of the licensee's procedural process for achieving post-fire safe shutdown conditions is largely dependent on the operators' ability to detect fire-induced mal-operations as they occur. However, the licensee's evaluation had not fully considered the potential for fire to damage diagnostic instrumentation needed to assure this capability in the event of fire; and (2) An inconsistency was identified between post-fire safe shutdown compliance strategies documented in the licensee's Safe Shutdown Analysis (Calc 5A011MC6023) and the implementing procedure (Operator Action List).

It was a pleasure to work with you and other members of the inspection team. Please do not hesitate to contact me at 631-344-7915 if you have any additional questions or comments.

Sincerely,

Kenneth Sullivan,
Nuclear & Infrastructure System Division

cc: D. Diamond, w/o Enc.
J. Higgins
W. Horak, w/o Enc
D. Norkin, (NRC)

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Report Input to U.S. Nuclear Regulatory Commission Region IV

Triennial Fire Protection Baseline Inspection of South Texas Project (STP) Units 1 and 2

(JCN: J-2843 Task Order 8)

Facility:	South Texas Project (STP)	
NRC Inspection Report No.:	50-498/02-03 and 50-499/02-03	
Inspection Conducted:	May 20-23, 2002	
NRC Inspectors:	R. Mullikin	RIV/DRS (Team Leader)
	G. Miller	RIV/DRS
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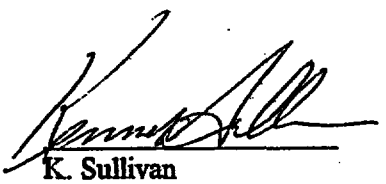
	N. O'Keefe	RIV/DRP

BNL Technical Specialist:  K. Sullivan

6/6/02
Date

Introduction

The inspection effort focused on an assessment of the adequacy of fire protection features provided for five specific fire areas that, based on the inspection team's review of the licensee's IPEEE submittal, in-plant walk-downs, and fire protection program documentation, were determined to have fire-risk significance. The specific fire zones selected for review were:

1. Fire Area 1 (Control Room/Relay Cabinet Area/ Watch Supervisor's Office)
2. Fire Area 2 (Multiple fire zones including Train A ESF Switchgear Room)
3. Fire Area 3(Multiple Zones Including Corridor at Elevation 10')
4. Fire Area 7 (Auxiliary Shutdown Area) and
5. Fire Area 31 (Train B Cable Spreading and Cable Room on Elevation 60')

1. Reactor Safety

Cornerstones: Initiating Events, Mitigating Systems

1R05 FIRE PROTECTION

.01 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

(Reviewed by other inspection team members)

.02 Fire Protection of Safe Shutdown Capability

(Reviewed by other inspection team members)

.03 Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

On a sample basis, an evaluation was performed to verify that cables of equipment required to achieve and maintain safe shutdown conditions in the event of fire in the selected fire areas had been adequately protected to ensure that fire-induced faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent safe shutdown. During the inspection a sample of components associated with the Component Cooling Water (CC), Charging (CV), Auxiliary Feedwater (AFW), Diesel Generator (DG) and and Reactor Coolant (RC) were selected for detailed review. Specific components include:

System	Components
CC	Pumps 1 A, B and C
	Train B CCW Hx Valves MOV 644 and 645
	Train A Pump Suction Isolation Valve MOV0052
	MOV 404 and FV4493
CV	N1CVFCV0201 - CCP 1A Min Flow recirc valve
	CCP Room 1A Cooler
	B1CVMOV0033A, B, C and D - (Seal Water to RCP 1A, B, C, and D)
	C1CVHCV0218 (Seal Inj Supply Isolation Valve)
	B1CVMOV113A and MOV112B (VCT Outlet Isolation Valves)
	Charging Pumps 1A, and B
AFW	Motor Driven Pumps A, B, and C
DG	DG 11, 12, 13
RC	Pressurizer PORVs and Block Valves

From this list of components, cable routing data depicting the routing of power and control cables associated with each of the selected components, was reviewed. Additionally, on a sample basis, the team also reviewed the licensee's analysis of electrical protective device (e.g., circuit breaker, fuse, relay) coordination and the adequacy of electrical protection provided for non-essential cables which share a common enclosure (e.g., cable tray) with cables of equipment required to achieve and maintain safe shutdown conditions.

b. Findings

10 CFR 50.48, "Fire Protection," and Appendix R to 10 CFR 50, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979" establish specific fire protection features required to satisfy General Design Criterion 3, "Fire Protection" (GDC 3, Appendix A to 10 CFR 50). Section III.G of Appendix R requires fire protection features be provided for equipment important to safe shutdown. An acceptable level of fire protection may be achieved by various combinations of fire protection features (barriers, fire suppression systems, fire detectors, and spatial separation of safety trains) delineated in Section III.G.2. For areas of the plant where compliance with the technical requirements of Section III.G.2 can not be achieved, licensees must either seek an exemption from the specific requirement(s) or provide an alternative shutdown capability in accordance with Sections III.G.3 and III.L of the regulation.

In SER Supplement No.2, Sect. 9.5.1.7, Fire Protection Of Safe Shutdown Capability, 1987 the staff states that with the exception of one fire area (containment) two redundant safe shutdown pathways will be available for safe shutdown. The licensee has subsequently revised its methodology to credit

the availability of only a single train of shutdown equipment for several fire areas. This revised approach (single train shutdown) meets the requirements of Appendix R Section III.G.

1. Inconsistency Between SSA results and Guidance Provided in Operator Action List

From a review of cable routing information provided by the licensee, the inspection team determined that cables associated with redundant trains of the Pressurizer PORVs and Pressurizer PORV Block Valves, are within Fire Areas 2, 7, 3, and 31. Specifically, Train "A" PORV(PCV 655A) and PORV Block valve (MOV0001A) are susceptible to spurious actuation in the event of fire in either Fire Area 2 or 7 and Train "B"PORV (PCV656A) and PORV Block Valve (MOV0001B) are susceptible to spurious actuation in the event of fire in either Fire Areas 3 or 31. To mitigate this event, operators are instructed (per the Operator Action List) to actuate disconnect switches that have been installed to ensure closure of a spuriously actuated PORV. While appearing to satisfy the STP fire protection licensing basis, the actions described in the OAL were found to be inconsistent with Compliance Strategies documented in the SSA for fire Areas 2, 3, 7, and 31 to the extent that the SSA compliance strategy credits the use of the High Head Safety Injection (SI) Pump as a means of mitigating a fire-induced actuation of the PORV. Additionally, although the use of the SI pump is identified on the SSA compliance strategies developed for these areas, the capability and availability of the SI system to perform this function in the event of fire had not been fully evaluated by the licensee. On 5/23/02 the licensee issued Condition Report No. 02-7750 to track resolution of the apparent inconsistency between the OAL and the SSA.

2. Diagnostic Instrumentation

The licensee's post-fire safe shutdown strategy relies heavily on having sufficient instrumentation available to enable operators to properly detect fire-induced mal-operations and implement actions needed to defeat them in a timely manner. Accordingly, the success of this approach is largely dependent on the instrumentation being available to ensure prompt detection of any mal-operations that may occur. This type of instrumentation is referred to as "diagnostic instrumentation." As stated in Generic Letter 86-10, "diagnostic instrumentation" is instrumentation needed to assure proper actuation and functioning of safe shutdown equipment and support equipment (e.g., flow rate, pump discharge pressure). The specific diagnostic instrumentation needed depends on the design of the shutdown capability. From a review of the licensee's documentation (SSA and required equipment list) and discussions with the licensee's staff, it does not appear that "diagnostic instrumentation" has been fully evaluated for the effects of fire damage. On 5/23/02 the licensee issued Condition Report No. 02-7757 to track resolution of this inconsistency.

c. Conclusion

Based on the findings described above, the inspector could not conclude that licensee's strategy for achieving and maintaining post-fire safe shutdown conditions meets the fire protection licensing basis documented by the staff in its Safety Evaluation Report (SER Supplement No.2, Sect. 9.5.1.7, Fire Protection Of Safe Shutdown Capability, 1987).

.04 Alternative Shutdown (ASD) Capability

(Reviewed by other inspection team members)

.05 Operational Implementation of ASD Capability

(Reviewed by other inspection team members)

.06 Communications for Performance of ASD Capability

(Reviewed by other inspection team members)

.07 Emergency Lighting for Performance of ASD Capability

(Reviewed by other inspection team members)

.08 Cold Shutdown Repairs
(Reviewed by other inspection team members)

.09 Fire Barriers and Fire Area/Zone/Room Penetration Seals

(Reviewed by other inspection team members)

.10 Fire Protection Systems, Features and Equipment

(Reviewed by other inspection team members)

.11 Compensatory Measures

(Reviewed by other inspection team members)

.12 Identification and Resolution of Problems

(Reviewed by other inspection team members)

Partial List of Persons Contacted

D. Wiegand	STP Lead Fire Protection
W. Mookhoek	STP Licensing
R. Piggott	STP Licensing
F. Cox	STP Fire Protection
R. Dukes	STP Consultant - Safe Shutdown Analysis
E. Heacock	STP Electrical Design
B. Wiegand	STP Cable Routing

Partial List of Documents Reviewed

Fire Hazards System Design Basis Document (DBD) 7A369MB1033, Rev. 1, 7/26/96
Bechtel Energy Corporation, Post-fire Single Train Shutdown Analysis ST-YB-HL-14152, Rev. 1
Calculation 5A011MC6023, Appendix R Evaluation, Rev. 7, 4/1/98
Calculation 85E019EL0003, Safe Shutdown Circuit Analysis Report, Rev. 0, 5/1/86
Calculation EC5053, Protective Device Coordination for Appendix R, (Sheets: 24 - 33, 36, 37, 42, 44, 177, 197, and 200) 3/23/80
Calculation 5E011EL0002, Safe Shutdown Circuit Listing, Rev. 2, dated 4/1/89.
Plant Database Management System (PDMS) cable routing data for selected components
Plant Database Management System (PDMS) cable data for cabling routed in trays TR A1XE2ATSAA and TR A1XM3BTTVA