



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

March 27, 2008
NOC-AE-08002274
10CFR50.90

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

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Response to Request for Additional Information on
Proposed Amendment for Deviation from Fire Protection Program Requirements
TAC Nos. MD 6694 & MD 6695

Reference: Letter from David W. Rencurrel to NRC Document Control Desk dated August 27, 2007, "License Amendment Request for Deviation for Fire Protection Program Requirements" (NOC-AE-07002169)

In the referenced letter, the STP Nuclear Operating Company (STPNOC) submitted a license amendment request to deviate from certain requirements of the STPNOC Fire Protection Program. This submittal responds to NRC questions regarding this request received by electronic mail on January 29, 2008.

There are no new commitments in this submittal. If you have any questions, please call Ken Taplett at 361-972-8416 or me at 361-972-7867.

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

Executed on 3/27/2008
Date


David W. Rencurrel
Vice President,
Engineering & Strategic Projects

Attachment: STPNOC Response to Request for Additional Information

A006
NRB

cc:

(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of State Health Services
1100 West 49th Street
Austin, TX 78756-3189

Mohan C. Thadani
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 7 D1)
11555 Rockville Pike
Rockville, MD 20852

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Mohan C. Thadani
U. S. Nuclear Regulatory Commission

Thad Hill
Eddy Daniels
Catherine Callaway
Brad Porlier
Staney Rostad
Steve Winn
NRG South Texas LP

Ed Alarcon
J. J. Nesrsta
R. K. Temple
Kevin Pollo
City Public Service

Jon C. Wood
Cox Smith Matthews

C. Kirksey
City of Austin

STPNOC RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

South Texas Project (STP) Units 1 and 2 Nuclear Power Plant
License Amendment Request (LAR)
Request for Additional Information (RAI) Regarding,
“Proposed Amendment for Deviation from Fire Protection Program Requirements
(MD6694 and MD6695)

The responses to the RAI questions were previously provided to the NRC in a “draft” form on February 26, 2008. The previous “draft” responses have been updated by the responses below.

NRC RAI

The proposed change would revise the STP Fire Protection Program to allow the performance of operator manual actions to achieve and maintain safe shutdown in the event of a fire in lieu of meeting circuit separation requirements specified in III.G.2 for a fire in Fire Area 32 located in the Mechanical/Electrical Auxiliary Building (MEAB). Specifically, the change would allow the licensee to manually de-energize at the breaker outside of the control room and manually open charging pumps suction valve Chemical and Volume Control System Motor Operated Valve (CV-MOV) CV-MOV-0112C (Train C) to align the charging pump suction to the Refueling Water Storage Tank (RWST) and to manually de-energize at the breaker outside of the control room and manually close the Volume Control Tank (VCT) outlet valve CV-MOV-0112B (Train B) to the charging pumps suction, instead of protecting the components in accordance with the STP current licensing basis. The cables for the motor operators to valve CV-MOV-0112C and CV-MOV-0112B are located in Fire Area 32. Cables for the redundant train charging pumps suction motor operated valve from the RWST (CV-MOV-113B) and the redundant VCT outlet valve (CV-MOV-0113A) to the charging pumps suction are also located in Fire Area 32. Units 1 and 2 are replicate plants with identical fire protection systems within the power block. The STP FHAR is applicable to both units.

The NRC staff needs the following clarifications information in order to determine if the operator manual actions will continue to meet the intent of the fire protection program in accordance with 10 CFR Part 50, Appendix R, Section III.G.2

NRC RAI 1

Under Criterion 2, Analysis Showing Adequate Time Available to Ensure Reliability, the licensee’s letter indicates that:

“Factors that cannot be recreated in the walk down demonstrations were analyzed. These include problems with equipment such as locked doors, environmental effects that can not be easily simulated in a demonstration, uncertainty in the travel paths

required by the safe shutdown operator, and variability in individual operator performance.”

Define the specific uncertainties related to the travel paths required by the safe shutdown operator that were considered in establishing the 50 minute time for the operator manual action.

STP Response

The 50 minute time for the operator manual action was established by having an operator walk through the procedure for a fire in Fire Area 32. The operator started at his normal watch station desk area in the MEAB. The walk through demonstrated that the operator reached the procedure steps to manually reposition the two valves and start the charging pump in approximately 38 minutes following entry into the procedure. Five minutes were added to operate each valve (a total of ten minutes for both valves). The total time to complete the actions to restore charging is conservatively estimated to take 50 minutes allowing for operator variability. After the procedure received a further enhancement, the walk through demonstrated that the operator reached the procedure steps to manually reposition the two valves and start the charging pump in approximately 36 minutes. Note that the thermal-hydraulic analysis requires restoration of charging within 2 hours (i.e. 120 minutes) following onset of the fire that results in a reactor trip. A reactor trip is not expected to result from a fire in Fire Area 32. Therefore, the 2 hour restoration time is conservative.

See response to RAI 2 for further discussion regarding impact if operator is not initially at his normal watch station desk area at the initiation of the event.

NRC RAI 2

Under Criterion 3, Environmental Factors, the licensee’s letter indicates that:

“The actions to de-energize and manually open CV-MOV-0112C and de-energize and manually close CV-MOV-0112B are performed in a readily accessible room (e.g., not locked) which can be reached from most plant locations without traversing through Fire Area 32.”

Are there areas of the plant in which the individual assigned this task would have to traverse Fire Area 32? If there are areas, provide technical justification for why this would be acceptable.

STP Response

Fire Area 32 is a large area with multiple levels. A fire could start in Fire 32 and the safe shutdown watch could still traverse this Fire Area without being impeded by the effects of the fire. There are two main plant areas where the safe shutdown operator could be initially located such that traversing through Fire Area 32 would be the normal transit route for performing the

steps (including the proposed manual actions) required of the operator in response to the fire. One area is the Fuel Handling Building (FHB) which is normally entered by the operator for a few minutes once per shift. If the fire is located in Fire Area 32 and impedes the transit route, the operator can use the alternate egress to the outside environment through an access door located in the truck bay doors. No key is required for egress. The second area is the Reactor Containment Building which the operator does not normally enter during the shift. If the fire is located in Fire Area 32 and impedes the transit route, the operator can exit containment through the auxiliary air lock to the outside environment. A key is located inside containment at the airlock for emergency egress. Use of the FHB egress alternate transit path would add less than 6 minutes and the use of the RCB egress alternate transit path would add less than 10 minutes to the time for the operator to perform the proposed manual actions, and assures that sufficient time margin remains to demonstrate that the actions are feasible and reliable.

One additional scenario could require the operator to transit Fire Area 32 or take an alternate route. If the RWST level indication is not available in the Control Room, the operator is directed to go to the FHB to verify the level indication by local indication. Alternate level indication can be provided by local pressure gauges on the suction of the low head safety injection pumps. If the operator can not traverse through Fire Area 32 because of the nature of the fire in that area, then the operator will traverse to the FHB from the outside transit route. This transit would add approximately 6 to 7 minutes to the time line. The original time line had the operator go to the FHB through Fire Area 32 takes approximately 3 minutes.

NRC RAI 3

How do you address smoke movement into adjacent fire areas from Fire Area 32 and how did you evaluate potential impact on access and egress routes for the person who has to perform the operator manual action? CV-MOV-0112C is located in Fire Area 25 and CV-MOV-0112B is located in Fire Area 3. Both of these fire areas border Fire Area 32.

STP Response

Fire Area 32 is a large multi-level fire area (12 fire zones) and surrounded by heavy concrete walls that prevent the spread of fire to adjacent fire areas. Some light smoke may propagate to adjacent areas. In the area of Fire Areas 3 and 25 where the manual actions are taken, Fire Area 32 has solid walls except for an open walkway. Ventilation is into Fire Area 32. With the openness of Fire Area 32 the majority of smoke should be vented upward. The HVAC design for this area is a once-through system so that the smoke should be forced out of the building.

NRC RAI 4

Appendix R, Section III.G.2 provides the following means to ensure that a redundant train of safe shutdown equipment is free of fire damage, where redundant trains are located in the same fire area:

- a. separation of cables and equipment by a fire barrier having a 3-hour rating.

This implies that the onsite fire brigade will be able to extinguish a fire within 3 hours.

- b. separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system in the fire area.

This implies that the automatic fire suppression system will extinguish the fire before damage is considered done or control the fire until the onsite fire brigade can extinguish the fire before damage is considered done.

- c. enclosure of cables and equipment in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system in the fire area

This implies that the automatic fire suppression system will extinguish the fire within 1 hour or the automatic fire suppression system will control the fire and the onsite fire brigade will extinguish the fire within 1 hour.

Given the physical characterization of Fire Area 32, provide a technical justification of how the partial detection, spatial separation, and partial suppression systems present provides adequate safety in lieu of III.G.2 protection. The use of manual actions alone is not considered equivalent to the robust protection required by III.G.2.

STP Response

Replace the description of "Fire Area 32" provided in Section 3.0 of Attachment 1 to the License Amendment Request of August 27, 2007 with the following description. Changes are indicated by change bars in the right-hand side of the page.

Fire Area 32: Fire Area 32 is a multi-elevation area in the Mechanical Electrical Auxiliary Building composed of several fire zones. The safe shutdown strategy in response to a fire in this fire area relies on the charging pump¹ 1B (2B) for plant makeup capability. Operator actions to realign the charging pump suction by providing a gravity drain from the RWST is required for plant makeup. The fire safe shutdown thermal-hydraulic analysis requires that these actions be performed within two hours of a reactor trip initiated in response to a fire. This ensures that makeup is available to the plant to support reactivity control and inventory control for plant cooldown.

Cables for each of the two charging pump suction motor-operated valves are routed

through Fire Area 32 without fully meeting the train separation requirements of the STP FPP. The redundant C Train vs. B Train cables are separated by a 3-hour rated floor (60' Mechanical Auxiliary Building (MAB) floor). This floor has unrated penetrations in it although they are not within 30 feet of the cable areas. The C Train cables are routed in Fire Area 32 Zone 122 and have fire suppression and detection in this zone. The B Train cables are routed through Fire Area 32 Zone 134 (29' MAB) with suppression and detection on both sides of the vertical cable trays in this area and then transverses the 10' MAB with no suppression in this area to the location of the B Train valve in Fire Area 25. For both cables to be impacted by a single fire, the fire would have to propagate approximately 70 feet horizontally on one level crossing a 5 foot hallway with heavy concrete walls and no combustibles, then traverse 39 feet in the vertical direction before traversing another 70 feet horizontally to affect the redundant cable. With the exception of the hallway, where there are no combustibles, there are moderate intervening combustibles along the path. These cables are separated by 3-hour rated floors with non-rated penetrations. See page 12 for a graphical view. Although considerable separation, detection and suppression are in this area between the redundant cables, the requirements of III.G.2 separation are not fully met (e.g. solid 3-hour barrier or full area suppression).

Procedure directs an operator to de-energize and manually open CV-MOV-0112C and de-energize and manually shut CV-MOV-0112B from areas located outside Fire Area 32 and inside Train C Switchgear Room. The areas where the valve is de-energized and manually operated do not require traversing Fire Area 32.

¹Charging pump 1B is in Unit 1 and charging pump 2B is in Unit 2.

Replace the "Conclusion" provided at the end of the Section 3.0 Technical Evaluation of Attachment 1 to the License Amendment Request of August 27, 2007 with the following remarks.

Conclusion

The operator manual actions to de-energize and manually open CV-MOV-0112C and de-energize and manually close CV-MOV-0112B need to be performed within 2 hours to support the safe shutdown analysis. It has been demonstrated that the manual actions can be performed with sufficient time margin to account for uncertainties. The actions are straightforward and do not create any significant concerns. Analysis of specific criteria discussed above demonstrates that the operator manual actions are feasible and reliable, and will not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

Operator manual actions which meet the criteria of NUREG-1852, alone, do not necessarily ensure that adequate safety is provided to ensure that the intent of the regulation is met. However, STPNOC does not rely solely on the proposed manual actions in Fire Area 32 to demonstrate that the ability to achieve and maintain safe

shutdown in the event of a fire is not adversely affected. In Fire Area 32, there is a large separation with moderate combustible loading between the redundant cables. This feature coupled with the detection and partial suppression provides additional engineered defense-in-depth to provide reasonable assurance that the manual actions will be successful and a fire in Fire Area 32 will not adversely impact the ability to achieve safe shutdown.

The proposed feasible and reliable manual actions in conjunction with the engineered defense-in-depth features provide adequate safety in lieu of fully meeting the III.G.2 protection requirements. Therefore, the proposed change to the Fire Protection Program will not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.