Nuclear Operating Company

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

December 4, 2014
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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
STPNOC Response to Request for Additional Information
Regarding the License Amendment Request for Technical Specification 3.3.1,
Reactor Trip System Instrumentation, Functional Unit 20 (TAC Nos. MF 3319 and MF 3320)

References:

1. Letter from G.T. Powell, STPNOC, to NRC Document Control Desk, "Supplement to License Amendment Request Proposed Revision to Technical Specification 3.3.1, Functional Unit 20, 'Reactor Trip Breakers'," June 9, 2014 (ML14184B363)

2. E-mail from B.K. Singal, NRC, to L.P Sterling, STPNOC, "Request for Additional Information Amendment to Revise Technical Specifications 3.3.1 Functional Unit 20, 'Reactor Trip Breakers', South Texas Project, Units 1 and 2, Docket Nos. 50-498 and 50-499", November 5, 2014 (ML14309A786)

3. E-mail from B.K. Singal, NRC, to L.P. Sterling, STPNOC, "Request for Additional Information, South Texas Project Units 1 and 2, License Amendment of TS 3.3.1, 'Reactor Trip System Instrumentation', Functional Unit 20, Docket Nos. 50-498 and 50-499", November 5, 2014 (ML14309A788)

On June 9, 2014, STP Nuclear Operating Company (STPNOC) submitted a license amendment request to revise Technical Specification (TS) 3.3.1, "Reactor Trip System Instrumentation," with respect to the required actions and allowed outage times for inoperable reactor trip breakers, Functional Unit 20 [Reference 1]. In two e-mails dated November 5, 2014 [Reference 2][Reference 3], the NRC requested additional information related to the STPNOC amendment request. Attachment 1 provides the STPNOC response to the Requests for Additional Information (RAI).

A001
NRR

STI: 33992006

There are no commitments in this letter.

If there are any questions regarding this letter, please contact Wendy Brost at (361) 972-8516 or me at (361) 972-7867.

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

Executed on 12/9/2014

D.W. Rencurrel
Senior Vice President of Operations

web

Attachment:
1. Response to Requests for Additional Information, License Amendment Request, Revision to TS 3.3.1, Functional Unit 20, "Reactor Trip Breakers"

cc:
(paper copy)

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RESPONSE TO REQUESTS FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST
REVISION TO TS 3.3.1, FUNCTIONAL UNIT 20, "REACTOR TRIP BREAKERS"

By letter dated January 6, 2014 [Reference 1], as supplemented by letter dated June 9, 2014 [Reference 2], STP Nuclear Operating Company (STPNOC) submitted a license amendment request (LAR) to revise South Texas Project (STP), Unit 1 and 2, Technical Specification (TS) 3.3.1, "Reactor Trip System Instrumentation," Table 3.3-1. The proposed amendment would revise TS 3.3.1 allowed outage times and required actions for inoperable reactor trip breakers, Functional Unit 20, to be consistent with those generically approved in NUREG-1431, Standard Technical Specifications, Westinghouse Plants, Revision 4.

On November 5, 2014 the Nuclear Regulatory Commission (NRC) submitted two sets of Requests for Additional Information (RAIs) via separate e-mails [Reference 3][Reference 4]. The NRC RAIs and STPNOC's responses to the RAIs are included below.

NRC Request – RAI 1

Westinghouse Topical Report WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS (Reactor Trip System) and ESFAS (Engineered Safety Features Actuation System) Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," (Agencywide Access and Management System (ADAMS) Accession No. ML030870542) analysis did not report uncertainty bounds for the proprietary data estimates, which may have an influence on plant-specific results. Please explain how the licensee considered the uncertainty in the data consistent with the guidance in Regulatory Guide (RG) 1.174, Revision 2, "An Approach for Using Probabilistic Risk-Assessment in Risk-Informed Decisions on Plant Specific Changes to the Licensing Basis," (ADAMS Accession No. ML100910006) and RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," (ADAMS Accession No. ML100910008) to ensure that the conclusions of WCAP-15376 remain valid for the plant-specific case.

STPNOC Response:

A formal assessment of the change in Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) was not performed for this LAR, rather, the applicability of Westinghouse topical report WCAP 15376-P-A was demonstrated.

The purpose of an uncertainty analysis is to ensure the contribution and impacts of uncertainties to the Probabilistic Risk Assessment (PRA) results are within the acceptance guidelines set forth in RG 1.174 and RG 1.177. Table 1 in Attachment A of Reference 2 demonstrates that the total CDF and total LERF are much less than the limits discussed in RG 1.174 for making risk-informed changes. The estimated value of the Anticipated Transient Without Scram (ATWS) contribution to CDF is small compared to the acceptance goal – approximately 4.3E-08 per year compared to an acceptance guideline of 1.0E-06 per year as described in RG 1.174 criteria.

Sufficient margin is provided such that a detailed uncertainty analysis would not affect the conclusion that the PRA results of WCAP 15376-P-A are applicable to STP and within the acceptance guidelines set forth in RG 1.174 and 1.177.

NRC Request – RAI 2

The licensee stated that "the quality of the South Texas project (STP) Probabilistic Risk Assessment (PRA) was reviewed by the Nuclear Regulatory Commission (NRC) as part of the process for approving Risk Managed Technical Specifications (RMTS) at the South Texas Project." The licensee stated that NRC staff reviewed Revision 5 of their PRA model as part of the RMTS application (Final Safety Evaluation for RMTS program ADAMS Accession Number: ML071780186). However, this application is supported by Revision 7.2 of the STP PRA model.

NRC Request – RAI 2a

a) Please explain whether any updates, upgrades, and peer reviews, as defined by ASME (American Society of Mechanical Engineers)/ANS (American Nuclear Society) RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," have been performed since the licensee's RMTS submittal.

STPNOC Response:

Revision 5 of the PRA model was in effect for the STP RMTS submittal. Two updates have been performed since Revision 5: Revision 6 and Revision 7.2. These revisions include industry and plant specific data updates, but do not affect the methodology of evaluating the risk associated with reactor trip breakers (RTBs) or TS 3.3.1.

Revision 7.2 was also an upgrade that changed the fundamental method of evaluating STP's Loss of Offsite Power (LOOP) recovery analysis, which also did not impact the RTBs or TS 3.3.1. The LOOP recovery analysis was the subject of the only peer review performed since the STP RMTS submittal and is not applicable to this LAR.

NRC Request – RAI 2b

b) Please provide the Facts and Observations (F&Os) and their dispositions from recent or previous peer reviews that are applicable to the proposed Technical Specification revision in this License Amendment Request (LAR).

STPNOC Response:

As discussed in the response to RAI 2a, the only peer review conducted since the STP RMTS submittal was for the LOOP recovery analysis. This peer review does not affect the risk associated with ATWS nor the RTBs. During a LOOP control rods drop to the bottom of core unless binding in the control rod channels is present, therefore, this analysis does not impact the RTBs.

NRC Request – RAI 2c

c) Please explain how the risk from external events is considered for this LAR.

STPNOC Response:

External events are modeled in the Average Maintenance at Power PRA. External events make up 40.58% of the CDF as shown in the table below.

STP_RV72 INITIATOR	***IE Frequency***	***CDF***	***%CDF***
External Events			
Tornado Induced Failure of Switchyard and Essential Cooling Pond	*1.22E-06*	*1.11E-06*	*18.31*
Fire Zone 047 Scenario X	*1.46E-05*	*3.65E-07*	*6.02*
Switchyard and Essential Cooling Pond Failure Due to Breach of Main Cooling Reservoir	*3.20E-07*	*2.91E-07*	*4.80*
Fire Zone 071 Scenario X	*2.34E-07*	*2.13E-07*	*3.51*
Fire Zone 047 Scenario B	*2.72E-03*	*2.09E-07*	*3.45*
Control Room Fire Scenario 18	*2.12E-06*	*9.12E-08*	*1.50*
Fire Zone 047 Scenario BC	*3.18E-06*	*5.91E-08*	*0.98*
Seismic Event, 0.4g Acceleration	*7.74E-07*	*4.04E-08*	*0.67*
Control Room Fire Scenario 23	*1.61E-06*	*2.62E-08*	*0.43*
Seismic Event, 0.6g Acceleration	*6.14E-08*	*2.08E-08*	*0.34*
Fire Zone 147 Scenario O	*1.08E-03*	*1.19E-08*	*0.20*
External Flooding Scenarios 2 Through 6	*1.05E-08*	*9.49E-09*	*0.16*
Seismic Event, 0.2g Acceleration	*2.89E-06*	*9.35E-09*	*0.15*
Seismic Event, 0.1g Acceleration	*3.02E-05*	*1.73E-09*	*0.03*
Control Room Fire Scenario 10	*3.43E-06*	*1.04E-09*	*0.02*
Flood Induced LOOP - Scenario 1	*3.20E-06*	*5.41E-10*	*0.01*
Group Subtotal	***3.87E-03***	***2.46E-06***	***40.58***

Both channels of Solid State Protection System (SSPS) are considered failed for the control room fire scenario 18 (FR18) initiator and all seismic initiators. Operator action to manually trip the reactor is credited in all external events.

There is no increase to risk of an unavailable SSPS channel for FR18 and the seismic initiators because both SSPS channels are considered failed. Note that for the Tornado, Breach of the Main Cooling Reservoir, and the other External Flooding Scenarios, a LOOP is included in the scenario, so that the signals to the RTBs are not relevant. For other external events the increase of risk due to only having one SSPS channel available is small because the Allowed Outage Time only adds a few hours of unavailability and the model credits operator action to manually trip the reactor.

NRC Request – RAI 3

RGs 1.174 and 1.177 establish the need for an implementation and monitoring program to ensure that extensions to Technical Specification Completion Times or bypass test times do not degrade operational safety over time and that no adverse effects occur from unanticipated degradation or common-cause mechanisms. Please explain how the licensee monitors the reliability and availability of the RTS instrumentation.

STPNOC Response:

The following surveillance procedures are performed for the RTS instrumentation:

- *Trip Actuating Device Operational Test (TADOT) surveillances for each train of RTS instrumentation including testing of the reactor trip bypass breaker, turbine trip relay testing, and automatic shunt trip testing for each train are performed at least once every nine months for both RTS trains*

- *Response time testing and reactor trip breaker gripper release surveillances for both RTS trains including automatic undervoltage trip testing and gripper release testing is performed at least once per 18 months*

The following Preventative Maintenance (PM) activities are performed for the RTS instrumentation:

- *Contingency maintenance support for the reactor trip breaker TADOT surveillance is performed as needed*

- *Thermography inspections to verify the integrity of cabinets, wiring, fasteners, and electrical connections on components associated with the RTS system is performed every 26 weeks*

- *Inspection and testing of each RTB and reactor trip bypass breaker is performed every refueling outage*

- *Lubrication and overhaul of each RTB and reactor trip bypass breaker is performed every 9 years*

These surveillances and PMs are performed at their respective frequencies and periodically reviewed for any needed changes.

NRC Request – New Action 12A

Basis for the Request

The licensee is proposing to add New Action 12A to Function 20, Reactor Trip Breakers, in TS 3.3.1, "Reactor Trip System Instrumentation," Table 3.3-1. The licensee stated in its application that this change is consistent with NUREG-1431, Revision 4.0, "Standard Technical Specifications, Westinghouse Plants."

New Action 12A states:

> "With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, within 48 hours restore it to OPERABLE status or initiate action to fully insert all rods; and within the next hour place the rod control system in a condition incapable of rod withdrawal."

The licensee stated that New Action 12A would address the condition where one diverse trip feature for a reactor trip breaker is inoperable when the reactor trip breakers are in the closed position and the control rod drive system is capable of rod withdrawal in Modes 3, 4, and 5. The licensee also stated that the proposed changes to TS 3.3.1, Table 3.3-1, New Action 12A address a condition that is not in South Texas Project (STP) TSs.

Request for Additional Information

Since New Action 12A is not in the licensee's current licensing basis (CLB), please explain why New Action 12A is needed and provide a technical evaluation for this change. In addition, please explain, given the CLB TS, how would the inoperability of a diverse trip feature impact the operability of a reactor trip breaker during the modes of applicability. Please include discussion of any TS actions entered, since this New Action 12A is currently not in STP's TSs.

STPNOC Response:

New Action 12A is being proposed to clarify the actions to take to address an inoperable diverse trip feature (reactor trip breaker undervoltage mechanism or shunt trip mechanism) while operating in Modes 3, 4, and 5. New Action 12A would provide the same option for Modes 3, 4, and 5 that Action 12 provides for Modes 1 and 2.

The RTBs are in the electrical power supply line from the control rod drive motor generator set power supply to the Control Rod Drive Mechanisms (CRDMs). Opening of the RTBs interrupts power to the CRDMs, which allows the shutdown rods and control rods to fall into the core by gravity. During normal operation the output from the SSPS is a voltage signal that energizes the undervoltage coils in the RTBs and bypass breakers, if in use. When the required logic matrix combination is completed, the SSPS output voltage signal is removed, the undervoltage coils are de-energized, the breaker trip lever is actuated by the de-energized undervoltage coil and the RTBs and bypass breakers are tripped open. This allows the shutdown rods and control rods to fall into the core. In addition to the de-energization of the undervoltage coils, each breaker is also equipped with a shunt trip device that is de-energized to trip the breaker open upon receipt of a reactor trip signal from the SSPS. Either the undervoltage coil or the shunt trip mechanism is sufficient by itself, thus providing a diverse trip mechanism.

With one of the diverse trip features inoperable, the reactor trip breakers would still open in the event that the other diverse trip feature is de-energized.

For Modes 1 and 2 in the current STP TSs, the inoperability of a diverse trip feature would require entering Action 12 to restore the feature to operable status within 48 hours or declare the breaker inoperable and enter Action 9 to be in Hot Standby within 6 hours.

For Modes 3, 4, and 5 in the current STP TSs when the Reactor Trip System breakers are in the closed position, the inoperability of a diverse trip feature would require entering Action 10 to restore the inoperable channel to operable status within 48 hours or open the RTBs within the next hour.

New Action 12A has the same result as the current Action 10. In new Action 12A, if the diverse trip feature is not returned to operable status within 48 hours, the rod control system is placed in a condition incapable of rod withdrawal within the next hour.

References

1. Letter from G.T. Powell, STPNOC, to NRC Document Control Desk, "License Amendment Request Proposed Revision to Technical Specification 3.3.1, Functional Unit 20, 'Reactor Trip Breakers'," January 6, 2014 (ML14035A075)

2. Letter from G.T. Powell, STPNOC, to NRC Document Control Desk, "Supplement to License Amendment Request Proposed Revision to Technical Specification 3.3.1, Functional Unit 20, 'Reactor Trip Breakers'," June 9, 2014 (ML14184B363)

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