

November 6, 2003

MEMORANDUM TO: David H. Jaffe, Project Manager
Project Directorate IV
Division of Licensing and Project Management

FROM: Jennifer L. Uhle, Section Chief */RA/*
PWR Systems Section
Reactor Systems Branch
Division of Systems Safety and Analysis

SUBJECT: SOUTH TEXAS PROJECT UNITS 1 AND 2 - CHANGES OF
TECHNICAL SPECIFICATION REGARDING PRESSURIZER SAFETY
VALVE SETPOINTS (TAC NOs. MB9104 AND MB9105)

Plant Name: South Texas Project Units 1 and 2
Utility: South Texas Project Nuclear Operating Company
TAC Nos: MB9104 and MB9105
Docket No: STN 50-498 and STN 50-499
Project Directorate: PD-IV
Project Manager: David H. Jaffe
Review Branch: SRXB/DSSA
Review Status: Complete

By letter dated May 22, 2003, as supplemented by letters dated September 10 and September 30, 2003, South Texas Project Nuclear Operating Company submitted a license amendment request for the South Texas Project Unit Nos. 1 and 2. The amendment involves a request to revise Technical Specifications (TS) 3.4.2.2, "Reactor Coolant System," to relax the lift setting tolerance of the pressurizer safety valves (PSVs) from +/- 2% to +2%, -3%. The current TS requirement that the as left setting be within +/- 1% following valve testing will remain unchanged.

The Reactor Systems Branch (SRXB) has completed its review of the proposed changes to TS 3.4.2.2. The staff has prepared the attached evaluation and concludes that the proposed TS is acceptable. This completes the SRXB review effort for TAC Nos. MB9104 and MB9105.

The Mechanical Engineering Branch (EMEB) has reviewed the proposed changes to TS 3.4.2.2 related to the requirements of the ASME Boiler and Pressure Vessel Code. The input provided by Gary Hammer of EMEB has been incorporated in the attached evaluation.

Attachment: As stated

Contact: Chu-yu Liang, SRXB/DSSA
415-2878

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*See previous concurrence page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
CONCERNING CHANGES OF TECHNICAL SPECIFICATION
REGARDING PRESSURIZER SAFETY VALVE SETPOINTS
SOUTH TEXAS PROJECT NUCLEAR OPERATING COMPANY
SOUTH TEXAS PROJECT UNIT NOS. 1 AND 2
DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

There are three pressurizer safety valves (PSVs) installed on each pressurizer of South Texas Project (STP) Units 1 and 2 to provide overpressure protection for the reactor coolant system (RCS), and the licensee also has three spare replacement PSVs. During refueling outages, all three valves are removed and replaced with the three spares, which have been previously tested and certified to lift at 2485 psig $\pm 1\%$. The three valves removed from the unit are sent offsite for testing and refurbishment in preparation for installation in the other unit during its next refueling outage.

The licensee states that there have been 58 as-found tests conducted on the PSVs at both STP Units 1 and 2 since operation began. In those tests, five valves have opened at pressures that are more than 2% above the setpoint and 24 valves have opened at pressures that are more than 2% below the setpoint. The licensee states that five Licensee Event Reports (LERs) have been generated due to the PSVs being out of tolerance, and has determined that the condition was bounded by analysis and did not violate any safety analysis limits.

The current technical specification (TS) 3.4.2.2, "Reactor Coolant System," requires that all pressurizer Code safety valves shall be OPERABLE with a lift setting of 2485 psig $\pm 2\%$ during Modes 1, 2, and 3. By letter dated May 22, 2003, South Texas Project Nuclear Operating Company (STPNOC, or the licensee), submitted a license amendment request to modify TS 3.4.2.2 to require that all pressurizer Code safety valves shall be OPERABLE with a lift setting of 2485 psig $\pm 2\text{-}3\%$ during Modes 1, 2, and 3. The current TS also requires that the as left setting pressure shall be $\pm 1\%$ following valve testing. This part of the TS requirement is not affected by the proposed license amendment request.

The licensee stated that the change is necessary to minimize TS violations caused by setpoint drift. The licensee has provided the results of its technical evaluation to support its proposed TS changes.

2.0 REGULATORY EVALUATION

The requirements of general Design Criterion (GDC) 15 of Appendix A to 10CFR 50 state that "the reactor coolant system and associated auxiliary, control and protection systems shall be designed with sufficient margin to assure that the design conditions of the reactor coolant pressure boundary are not exceeded during any conditions of normal operation, including anticipated operational occurrences." Also, because the proposed change could result in an increase in the volume of fluid that is released to the pressurizer relief tank (PRT) during an overpressure condition, the requirements of GDC 4 are also applicable. GDC 4 states: "Structures, systems, and components important to safety shall be designed to accommodate

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the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents.” Title 10 of the Code of Federal Regulations (CFR), Part 50.36, specifies the Commission’s regulatory requirements related to the content of TSs. Specifically, 10 CFR 50.36(c)(2)(ii) sets forth four criteria to be used in determining whether a Limiting Condition for Operation (LCO) is required to be included in TSs. These criteria are: (1) installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the RCS pressure boundary; (2) initial plant conditions that are assumed in a design-basis transient and accident analysis; (3) components or systems that are used for mitigating consequences of the design-basis transient and accident; and (4) components or systems which probabilistic risk assessment has shown to be significant to public health and safety.

The Standard Technical Specification (STS) requirements were developed based on the criteria established in 10 CFR 50.36(c)(2)(ii). Existing LCOs and related surveillance requirements (SRs) that have been established as TS requirements which satisfy any of the criteria specified in 10 CFR 50.36(c)(2)(ii) must be retained in the TSs. STP Units 1 and 2 use the pressurized water type of nuclear steam supply system manufactured by Westinghouse Electric Corporation. PSVs are part of the primary success path and credited in the Updated Final Safety Analysis Report for mitigating the effects of design-basis events. In accordance with Criterion 3 of 10 CFR 50.36(c)(2)(ii) discussed above, a TS LCO is required for the PSVs.

The staff’s review of the proposed change to TS 3.4.2.2 will be based on continued compliance with GDC 4 and GDC 15.

3.0 TECHNICAL EVALUATION

The staff has reviewed the licensee’s proposed change to TS 3.4.2.2 and has prepared the following evaluation. The purpose of the staff’s review is to confirm that the licensee’s record of the design-basis analysis remains valid and acceptable, and that the proposed TS change correctly reflects the results of the licensee’s analysis and meets the intent of the applicable section(s) of the STS.

The main design purpose of the PSVs is to provide overpressure protection for the reactor coolant system (RCS). Together with the reactor protection system, the PSVs ensure that the RCS pressure does not exceed 110% of RCS design pressure (2750 psia) during the most limiting operational transient with reactor scram. In assessing the effects of the proposed TS change on the design-basis event analyses, the licensee evaluated the existing transient and accident analyses and concluded that the assumed opening of PSVs at the upper bound setting (2485 psig +2%) would result in the highest peak RCS pressure. Since the proposed TS does not change the upper bound setting of the PSVs, the current analyses with respect to peak pressures remain valid. Therefore, the staff concludes that the analyses of record for events sensitive to peak RCS pressures remain valid and acceptable for supporting the proposed change to TS 3.4.2.2.

The licensee stated, and the staff agrees, that the tolerance of -3 percent proposed for the PSV setpoint has no effect on the transient analyses that are sensitive to DNB. The power operated relief valves (PORVs) are assumed to operate during these events for conservative results with respect to DNB. The PORV settings are considerably lower than the lower bound of the proposed negative tolerance for PSVs.

In addition, the licensee indicated that the proposed change does not violate the design basis that requires a reactor trip actuation before the opening of the PSVs during a pressurization event. The PSV setpoint is designed to be above the high pressurizer pressure reactor trip setpoint with its tolerance. Specifically, the lowest PSV setpoint is 2410 psig (2485 psig -3%) which is above the upper limit of 2405 psig (high pressure reactor trip setpoint of 2380 psig plus 25 psig for the calculated channel statistical allowance) for the high pressure reactor trip actuation setting. The staff considers this to be acceptable.

Therefore, the staff finds that the proposed change to the PSV setpoint tolerance would not result in a reduction in the margin of safety. Further, the staff has determined that, since the as-left tolerance for the PSVs will continue to be $\pm 1\%$ and the frequency of testing is not affected, it is not expected that the proposed change would result in a greater rate of degradation of the PSV setpoint over time.

The licensee has also evaluated the proposed change to the PSV setpoint tolerance to determine if it is consistent with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The licensee determined that the proposed change is within the limits specified by both ASME Section III for overpressure protection and by ASME Section XI for testing the PSVs. The staff finds that the licensee's evaluation of the applicable ASME Code requirements is acceptable.

In response to the staff's request regarding any effects of the proposed change to TS 3.4.2.2 on systems and components downstream of the PRVs, the licensee's supplemental submittal dated September 10, 2003, stated that the amendment request does not involve any physical modification to the plant design, changes in plant operation, or revision of the "as-left" lift setting of the PSVs. The licensee indicated that no physical changes were being made that would affect the design capability of the systems and components downstream of the PSVs, including the PSV tail pipes and the pressurizer relief tank (PRT). The licensee evaluated the effect of changing the PSV lower lift pressure tolerance from -2% to -3% on the capability of the PRT to absorb the design-basis discharge of steam from the PSVs. As discussed in a supplemental submittal dated September 30, 2003, the licensee determined that the proposed change will not cause the PRT design basis capacity to be exceeded. Based on the information that was provided, we agree that the design-basis capability of the PRT will not be compromised by the proposed change to TS 3.4.2.2.

Based on our review, we have determined that the proposed change to the PSV setpoint tolerance: (1) is bounded by the analysis of record, (2) does not violate the design basis that requires a reactor trip actuation before lifting of the PSVs during an event that results in an increase in pressurizer pressure, (3) satisfies applicable ASME Code requirements, and (4) will not compromise the design-basis capability of the PRT. Therefore, the proposed change to the PSV setpoint tolerance is acceptable.

4.0 CONCLUSIONS

The staff has evaluated the licensee's request to change TS 3.4.2.2 for STP Units 1 and 2 to increase the lower bound of the as-found PSV lift setpoint tolerance from -2% to -3%. The proposed change is intended to minimize TS violations caused by PSV setpoint drift that typically occurs over the course of the plant operating cycle. Based on the evaluation discussed in Sections 2.0 and 3.0 above, the staff finds that the proposed change to the PSV

as-found setpoint tolerance is bounded by the analysis of record and it does not violate the design basis that requires a reactor trip actuation before the PSV lift setpoint is reached. Therefore, the staff concludes that the proposed change to TS 3.4.2.2 is acceptable.

5.0 REFERENCES

1. STPNOC Letter, T. J. Jordan to NRC, "Proposed Amendment to Technical Specification 3.4.2.2," dated May 22, 2003.
2. STPNOC Letter, G. L. Parkey to NRC, "Response to Request for Additional Information Regarding a Proposed Amendment to TS 3.4.2.2," dated September 10, 2003.
3. STPNOC Letter, G. L. Parkey to NRC, "Revised Response to Request for Additional Information Regarding a Proposed Amendment to TS 3.4.2.2," dated September 30, 2003.