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

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10CFR50.92
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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Proposed New Amendment
for Atmospheric Steam Relief Valve Instrumentation and
Revised Amendment
of Technical Specification 3.7.1.6, Atmospheric Steam Relief Valves

Reference:

1. Letter from T. H. Cloninger to NRC Document Control Desk, "Proposed Amendment of Technical Specification 3.7.1.6, Atmospheric Relief Valves", dated August 18, 1997 (ST-HL-AE-5689)

2. Letter from T. H. Cloninger to NRC Document Control Desk, "Withdrawal of Proposed Amendment of Technical Specification 3.7.1.6, Atmospheric Relief Valves", dated January 19, 1999 (NOC-AE-000406)

3. Letter from T. H. Cloninger to NRC Document Control Desk, "Proposed Amendment to Technical Specifications to Reflect Replacement Steam Generator Water Level Trip Setpoint Differences", dated July 2, 1998 (NOC-AE-0163)

4. Letter from D. A. Leazar to NRC Document Control Desk, "10CFR50.46 30 Day Report of Significant Changes to the Accepted Emergency Core Cooling System Model", dated July 17, 1997, (ST-HL-AE-5698)

5. Letter from D. A. Leazar to NRC Document Control Desk, "10CFR50.46 Report", dated July 7, 1998, (ST-NOC-AE-000189)

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Reference 1 was a proposed amendment to the South Texas Project Technical Specification 3.7.1.6, "Atmospheric Steam Relief Valves". The proposal was submitted to ensure the automatic feature of the Steam Generator Power Operated Relief Valve remains operable during Modes 1 and 2. This feature is consistent with the South Texas Project safety analysis. A temporary administrative control was added to operating procedures to ensure the automatic actuation of the Steam Generator Power Operated Relief Valves remains operable in Modes 1 and 2. The Nuclear Regulatory Commission subsequently requested that the South Texas Project withdraw Reference 1 primarily because the submittal defined Mode applicability in the Technical Specification Bases rather than in the Technical Specification. In addition, the South Texas Project was requested to consider locating the "controls" requirements for the Steam Generator Power Operated Relief Valves into the instrumentation section of the Technical Specification. The South Texas Project withdrew the proposal in Reference 1 on January 19, 1999 per Reference 2.

The proposal in this letter is related to Reference 3 which proposes to incorporate changes into the South Texas Project Technical Specifications associated with the Replacement Steam Generator Project. The safety evaluation for the Reference 3 proposal credits automatic operation of the Steam Generator Power Operated Relief Valves.

By this letter, the South Texas Project proposes to amend Facility Operating Licenses NPF-76, Unit 1 and NPF-80, Unit 2 by incorporating

- a new Technical Specification for Atmospheric Steam Relief Valve Instrumentation, and
- a revision to Technical Specification 3.7.1.6, Atmospheric Steam Relief Valves.

These changes ensure that the automatic feature of the Steam Generator Power Operated Relief Valve (i.e., Atmospheric Steam Relief Valves) remains operable during Modes 1 and 2. In addition, the proposed change adds an associated surveillance that requires a Channel Calibration on the Steam Generator Power Operated Relief Valve be performed every 18 months. This frequency is consistent with similar Technical Specification requirements for Channel Calibrations.

A reanalysis of the Small Break Loss of Coolant Accident (SBLOCA) event at the South Texas Project determined that a previous assumption of no safety injection flow into the broken loop was not conservative. With safety injection flow into the broken loop considered, analysis results indicated that the Peak Clad Temperature (PCT) acceptance limit of 10CFR50.46 could be exceeded unless credit is taken for the automatic actuation of the Steam Generator Power Operated Relief Valves. If the automatic feature of the Steam Generator Power Operated Relief Valves remains operable during Modes 1 and 2, the analysis results show a calculated PCT well below

the acceptance limit of 10CFR50.46. The change in the reanalysis of the SBLOCA event and the action taken to show compliance with 10CFR50.46 requirements was reported to the Nuclear Regulatory Commission on July 17, 1997 by Reference 4. Subsequently, Reference 5 notified the Nuclear Regulatory Commission that a complete reanalysis of the SBLOCA was performed using the approved Emergency Core Cooling System evaluation model for the South Texas Project Units 1 and 2. The SBLOCA PCT including all PCT assessments changed from 1860°F (Reference 4) to 1849°F (Reference 5). The Steam Generator Power Operated Relief Valves are Class 1E powered and have safety grade automatic actuation. Pending approval of this proposed Technical Specification Amendment, administrative controls have been established to require the automatic actuation function of the Steam Generator Power Operated Relief Valves to be operable when Units 1 and 2 are in Modes 1 and 2.

The South Texas Project has reviewed the attached proposed amendment pursuant to 10CFR50.92 and determined that it does not involve a significant hazards consideration. In addition, the South Texas Project has determined that the proposed amendment satisfies the criteria of 10CFR51.22(c)(9) for categorical exclusion from the requirement for an environmental assessment. The South Texas Project Plant Operations Review Committee and Nuclear Safety Review Board have reviewed and approved the proposed change.

In accordance with 10CFR50.91(b), South Texas Project is providing the State of Texas with a copy of this proposed amendment. Upon Nuclear Regulatory Commission approval of this proposed Technical Specification Amendment, the South Texas Project requests 30 days to implement this amendment. If you should have any questions concerning this matter, please call Mr. A. W. Harrison at (512) 972-7298 or me at (512) 972-8787.

T. H. Cloninger
Vice President,
Engineering and Technical Services

KJT/

Attachments:
1. Affidavit
2. Technical Specification Change and Safety Evaluation
3. Determination of No Significant Hazards Consideration
4. Environmental Assessment
5. Technical Specification Proposed New Page or Marked-up Page Changes

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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# ATTACHMENT 1

## AFFIDAVIT

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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|---|---|---|
| In the Matter of | ) | |
| | ) | |
| South Texas Project Nuclear | ) | Docket Nos. STN 50-498 |
| Operating Company | ) | STN 50-499 |
| | ) | |
| South Texas Project Units 1 and 2 | ) | |

AFFIDAVIT

I, T. H. Cloninger, being duly sworn, hereby depose and say that I am Vice President, Engineering and Technical Services of STP Nuclear Operating Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached proposed new amendment for Atmospheric Steam Relief Valve Instrumentation and revised amendment of Technical Specification 3.7.1.6; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

T. H. Cloninger
Vice President,
Engineering and Technical Services

STATE OF TEXAS )
)
COUNTY OF MATAGORDA )

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 22nd day of March, 1999.

LINDA RITTENBERRY
Notary Public, State of Texas
My Commission Expires
OCT. 9, 2001

Linda Rittenberry
Notary Public in and for the
State of Texas

# ATTACHMENT 2

## TECHNICAL SPECIFICATION CHANGE DESCRIPTION AND SAFETY EVALUATION

## BACKGROUND

Note: The term "Steam Generator Power Operated Relief Valve" is the same valve as the term "Atmospheric Steam Relief Valve" referred to in Technical Specifications

During long term planning and preparation for steam generator replacement at the South Texas Project, an analysis was completed to assess the impact of safety injection flow into the broken loop for a Small Break Loss of Coolant Accident (SBLOCA) event. The analysis results identified the potential for the calculated Peak Clad Temperature to exceed the 2200°F limit of 10CFR50.46 for Units 1 and 2. An additional analysis demonstrated that by taking credit for the automatic actuation of the Class 1E powered Steam Generator Power Operated Relief Valves, the Peak Clad Temperature would be reduced to considerably below 2200°F. As a remedial action, administrative controls have been established to require the automatic actuation of the Steam Generator Power Operated Relief Valves to be operable when Units 1 and 2 are in Modes 1 and 2. The automatic actuation of the Steam Generator Power Operated Relief Valves is not a new design feature. The effects of the inadvertent opening of a Steam Generator Power Operated Relief Valve are currently analyzed as described in Section 15.1.4 of the Updated Final Safety Analysis Report. The automatic actuation of the Steam Generator Power Operated Relief Valves is now found necessary to mitigate the consequences of a SBLOCA event and meet the requirements of 10CFR50.46. The South Texas Project submits this Technical Specification Amendment to add this Limiting Condition for Operation in accordance with criterion (3) of 10CFR50.36(c)(2)(ii).

When the South Texas Project was originally licensed, the SBLOCA event analysis assumed no safety injection flow into the broken loop. Subsequent analysis of the SBLOCA event showed this assumption was not conservative. Safety injection flow into the broken loop should be considered. The relatively cool safety injection flow subcools the fluid in the cold leg where the break is assumed to occur. The density of the fluid in the Reactor Coolant System cold leg increases which causes the mass flow rate out of the break to increase. As a result, the water mass in the Reactor Coolant System decreases so that the core becomes uncovered for a longer period of time than the condition when no flow into the broken loop is assumed. Consequently, an increase in Peak Clad Temperature occurs as compared to the result in the original analysis.

The South Texas Project originally assumed a 150°F penalty to account for safety injection into the broken loop. The 150°F penalty was developed by Westinghouse through the use of a generic 4-loop plant model. Due to the unique design features of the South Texas Project the use of the penalty developed with a generic model was questioned.

For a typical 4-loop plant, approximately one-fourth of the safety injection flow enters the broken loop because the safety injection system is cross-headered to each loop. In the

South Texas Project design, the redundant safety injection trains are not cross-headered; each train only flows into its respective loop. Therefore, one full train of safety injection flow is assumed to enter the broken loop and considerably more subcooling of the fluid in the broken loop occurs. Additional analysis using a South Texas Project-specific model showed that the 150°F penalty was not sufficient. By considering the unique non-header design of the South Texas Project's safety injection system, the Peak Clad Temperature could exceed the 10CFR50.46 limit of 2200°F.

During the SBLOCA event, the pressure in the Reactor Coolant System equilibrates to just above the saturation pressure of the Steam Generators until the reactor coolant loop seal clears. In the original SBLOCA Analysis of Record, the saturation pressure of the Steam Generators was determined by the lowest setpoint of the Main Steam Safety Valves. The lowest Main Steam Safety Valve setpoint is 1285 psig with a 3% uncertainty of 39 psi for a setpoint of 1324 psig. At this pressure, safety injection flow into the Reactor Coolant System has been determined to be insufficient to maintain a Peak Clad Temperature of less than 2200°F. If the saturation pressure of the Steam Generators is assumed to be determined by the 1225 psig setpoint with uncertainties associated with the automatic actuation of the Steam Generator Power Operated Relief Valve, Steam Generator and Reactor Coolant System pressure would be lower. Safety injection flow into the Reactor Coolant System would increase which significantly lowers the calculated Peak Clad Temperature to a value below the limit of 10CFR50.46.

## DESCRIPTION OF CHANGES

The proposed change requests

- a new Technical Specification for Atmospheric Steam Relief Valve Instrumentation, and
- a revision to Technical Specification 3.7.1.6, Atmospheric Steam Relief Valves.

The new instrumentation specification ensures the automatic control feature of the Steam Generator Power Operated Relief Valve remains operable during Modes 1 and 2. This will allow mitigation of the consequences of a SBLOCA event and meet the requirements of 10CFR50.46. The proposed change adds an associated surveillance to the new instrumentation specification that requires a Channel Calibration on the Steam Generator Power Operated Relief Valve, which includes verification of automatic actuation at the 1225 psig setpoint with uncertainties, be performed every 18 months. This surveillance interval is consistent with assumed uncertainties in the safety analysis to ensure the Steam Generator Power Operated Relief Valves will perform their intended function. The new instrumentation specification allows manual operation of the Steam Generator Power Operated Relief Valve(s) in Mode 2 if being used to maintain the secondary side pressure at or below an indicated steam generator pressure of 1225 psig. This condition is required during plant startup to place a steam load on the plant to control primary plant temperature. The action statements for an inoperable automatic actuation control

channel(s) are consistent with those for the manual actuation control channels except that only Mode 3 is required to be achieved if the allowed outage times can not be met.

The requirement for manual controls for Steam Generator Power Operated Relief Valves to be operable in Modes 1 through 4 are moved from specification 3.7.1.6 to the new instrumentation specification. The limiting condition for operation, applicability and action statements for manual controls remain unchanged from that currently found in specification 3.7.1.6.

Specification 3.7.1.6 is revised to delete manual controls as a limiting condition for operation for the Atmospheric Steam Relief Valves. The limiting condition for manual controls is moved to the new instrumentation specification. Surveillance requirement 4.7.1.6 is revised to reflect that valve operation must be verified by operation using both automatic and manual controls following any cold shutdown of 30 days or longer or following any refueling shutdown. The wording "any cold shutdown of 30 days or longer or following any refueling shutdown" is rearranged to clarify that surveillance 4.7.1.6 should be performed following any refueling shutdown regardless of duration.

## SAFETY EVALUATION

The Westinghouse NOTRUMP computer code is used in the analysis of SBLOCAs in the Reactor Coolant System. The modeling of Steam Generator secondary side atmospheric relief capability has always been an important feature of the Westinghouse SBLOCA Evaluation Model. Atmospheric relief is significant to the depressurization of the primary and secondary system during a SBLOCA. This depressurization directly influences the rates of break flow from the reactor vessel and safety injection into the reactor vessel. The modeling of safety-grade Steam Generator Main Steam Safety valves is standard for all NOTRUMP analysis with Westinghouse Nuclear Steam System Supply designs.

A Peak Clad Temperature analysis for the SBLOCA event was performed using the currently approved NOTRUMP Evaluation Model, WCAP-10054-P-A, referenced in the South Texas Project Updated Final Safety Analysis Report. The model included asymmetric Emergency Core Cooling System and Auxiliary Feedwater System flows unique to the South Texas Project. The model also credits the Class 1E-powered Steam Generator Power Operated Relief Valves for the South Texas Project. The modeling of the Steam Generator Power Operated Relief Valves was performed consistent with the modeling of secondary atmospheric relief valves as described in the NOTRUMP evaluation model, WCAP-10054-P-A. Since the analysis takes credit for the automatic feature of the Steam Generator Power Operated Relief Valves, a single failure of a Steam Generator Power Operated Relief Valve has been considered in the single failure analysis for the SBLOCA event.

The plant-specific reanalysis reconsidered various combinations of break locations and limiting single failure scenarios that are unique to the South Texas Project. The results of the reanalysis crediting the use of the Steam Generator Power Operated Relief Valves show that the Peak Clad Temperature with all penalties considered is 1849°F which is well below the 10CFR50.46 acceptance limit of 2200°F.

The automatic actuation of the Steam Generator Power Operated Relief Valves is not a new design feature. The effects of the inadvertent opening of a Steam Generator Power Operated Relief Valve are currently analyzed as described in Section 15.1.4 of the Updated Final Safety Analysis Report. Operating procedures have a temporary administrative control to ensure the automatic actuation of the Steam Generator Power Operated Relief Valves remains operable in Modes 1 and 2. This condition will become permanent with the approval of this Technical Specification Amendment proposal.

The Steam Generator Power Operated Relief Valves are hydraulically actuated. Each valve has a small, completely self-contained hydraulic plant located immediately above the valve. The hydraulic plant consists of a positive displacement pump, an accumulator, a reservoir (for hydraulic fluid), a manifold, a servo-valve, a servo-amplifier, solenoid valves, check valves, flow control valves, relief valves, pressure switches, a level switch, tubing and various fittings and electrical connections. This plant is connected directly to the valve's hydraulic operating cylinder.

The hydraulic pump operates as necessary to charge hydraulic fluid into the accumulator from the reservoir. By doing so, the pump forces hydraulic fluid into the accumulator and compresses the nitrogen charge that is present on the opposite side of the internal moveable piston. This stored energy in the compressed nitrogen in the accumulator provides the motive force to move the accumulator piston, thus forcing hydraulic fluid out of the accumulator and into the operating cylinder of the valve, causing the valve to stroke. The amount of nitrogen within the accumulator and the amount of hydraulic fluid that circulates in the hydraulic plant are finite and these fluids do not interface with any other plant system or any other valve. The components of the hydraulic plant are arranged so that the valve may be stroked in the open or closed direction from the control room.

The hydraulic pump is powered by 480 VAC class 1E power. The control circuitry is powered by 125 VDC class 1E power. The valve may be operated on a continuous basis provided that the power supplies and the valve and valve actuator components do not fail. If power is lost, the valve is capable of stroking by using stored energy in the accumulator.

In conclusion, by taking credit for the automatic feature of the Steam Generator Power Operated Relief Valves, the Peak Clad Temperature with all penalties considered is 1849°F which is well below the 10CFR50.46 acceptance limit of 2200°F.

# ATTACHMENT 3

## DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

## DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

In accordance with the criteria set forth in 10 CFR 50.92, the South Texas Project has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

The methodologies used in the accident analyses remain unchanged. The automatic actuation of the Steam Generator Power Operated Relief Valves is not a new design feature. The effects of the inadvertent opening of a Steam Generator Power Operated Relief Valve are currently analyzed as described in Section 15.1.4 of the Updated Final Safety Analysis Report. The radiological consequences for the Small Break Loss of Coolant Accident (SBLOCA) event presented in the Updated Final Safety Analysis Report remain unchanged. The calculated Peak Clad Temperature is 1849°F remaining substantially below the 2200°F acceptance limit of 10CFR50.46. Although the manual control specification is relocated from Specification 3.7.1.6 to the new instrumentation specification, the limiting condition for operation, applicability and action statements for manual controls remain unchanged. Therefore no increase in the probability or consequences of any accident previously evaluated will occur.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

The automatic actuation of the Steam Generator Power Operated Relief Valves is not an accident initiator for the SBLOCA event. The automatic actuation of the Steam Generator Power Operated Relief Valves currently exists at the South Texas Project and is not a new design feature. The description of the Steam Generator Power Operated Relief Valves currently exists in the Updated Final Safety Analysis Report. This change does not represent a change to the facility and does not affect the safety functions and reliability of systems, structures, or components in any new manner. Operating procedures have a temporary administrative control to ensure the automatic actuation of the Steam Generator Power Operated Relief Valves remains operable in Modes 1 and 2. This condition will become permanent with the approval of this Technical Specification Amendment proposal. Although the manual control specification is relocated from Specification 3.7.1.6 to the new instrumentation specification, the limiting condition for operation, applicability and action statements for manual controls remain unchanged. Since the automatic actuation of the Steam Generator Power Operated Relief Valves is not an accident initiator and is not a new design feature to the facility, no possibility exists for a new or different kind of accident from those previously evaluated.

**3. Does this change involve a significant reduction in a margin of safety?**

The proposed change results in the calculated Peak Clad Temperature of 1849°F remaining well below the acceptance limit of 10CFR50.46 and comparable to the results currently described in the Updated Final Safety Analysis Report. Therefore, the change does not involve a significant reduction in a margin of safety.

**Based on the above, the South Texas Project has evaluated the proposed Technical Specification change and determined it does not represent a significant hazards consideration**

# ATTACHMENT 4

## ENVIRONMENTAL ASSESSMENT

## ENVIRONMENTAL ASSESSMENT

This proposed Technical Specification Change has been evaluated against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. It has been determined that the proposed changes meet the criteria for categorical exclusion as provided for under 10 CFR 51.22(c)(9). The following is a discussion of how the proposed Technical Specification Change meets the criteria for categorical exclusion.

10 CFR 51.22(c)(9): Although the proposed change involves changes to requirements with respect to inspection or surveillance requirements;

(i) the proposed change involves no Significant Hazards Consideration (refer to the No Significant Hazards Consideration section of this Technical Specification Change Request),

(ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite since the proposed changes do not affect the generation of any radioactive effluents nor do they affect any of the permitted release paths, and

(iii) there is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Based on the aforementioned and pursuant to 10 CFR 51.22(b), no environmental assessment or environmental impact statement need be prepared in connection with issuance of an amendment to the Technical Specifications incorporating the proposed changes of this request.