

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

April 27, 1995  
ST-HL-AE-5079  
File No.: G20.02.01  
10CFR50.90  
10CFR50.91  
10CFR50.92  
10CFR51

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project  
Units 1 and 2

Docket Nos. STN 50-498, STN 50-499

Proposed Amendment to Technical Specification 3.3.3.5 and Technical Specification 3.3.3.6  
Regarding Required Operable Channels of Core Exit Thermocouples

Houston Lighting & Power Company requests that the Nuclear Regulatory Commission review and approve the attached proposed change to Technical Specifications 3.3.3.5 and 3.3.3.6 with regard to the requirements for operable channels of core exit thermocouples. The proposed changes are based on the requirements incorporated in NUREG 1431, "Standard Technical Specifications - Westinghouse Plants".

Houston Lighting & Power requests this proposed change be considered an exigent change in accordance with the provisions of 10CFR50.91. South Texas Project, Unit 2, is presently in ACTION 42 b of Technical Specification 3.3.3.6. Without resolution, a plant shutdown will be required on May 17, 1995. Houston Lighting & Power has been actively attempting to restore the specified core exit thermocouple configuration. As noted in the attached evaluation, a shutdown for the limited number of inoperable core exit thermocouples is not justified for plant safety.

Houston Lighting & Power has reviewed the proposed change in accordance with the requirements of 10CFR50.92 and concluded that it introduces no significant hazards considerations. The Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed this conclusion and concur. In addition, Houston Lighting & Power has determined that the proposed amendment satisfies the criteria of 10CFR51.22(c)(9) for categorical exclusion from the requirement for an environmental assessment because the proposed amendment does not affect effluents, and the changes in the surveillance requirements are not significant with respect to personnel radiation exposure. By copy of this letter, the State of Texas will be apprised of the proposed change.

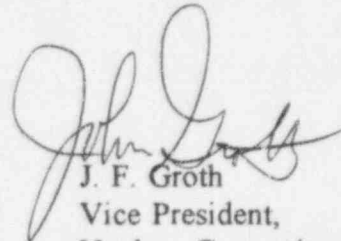
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050008 Project Manager on Behalf of the Participants in the South Texas Project

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The description of the proposed change, the Safety Evaluation, No Significant Hazards Considerations Evaluation, and proposed changes to the Technical Specifications are attached.

If you have any questions, please contact Mr. A. W. Harrison at 512-972-7298, or me at 512-972-8664.



J. F. Groth  
Vice President,  
Nuclear Generation

AWH/  
Attachments:

1. Affidavit
2. Safety Evaluation and No Significant Hazards Considerations Determination
3. Annotated Technical Specification Pages and Revised Bases

Houston Lighting & Power Company  
South Texas Project Electric Generating Station

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c:

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**ATTACHMENT 1**

**AFFIDAVIT**

ATTACHMENT 1

AFFIDAVIT

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )

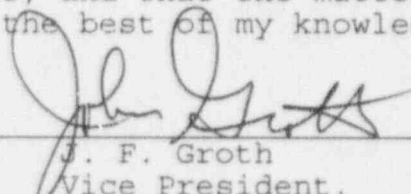
Houston Lighting & Power )  
Company, et al., )

South Texas Project )  
Units 1 and 2 )

Docket Nos. 50-498  
50-499

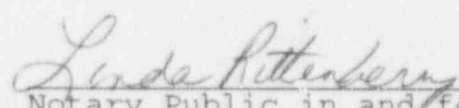
AFFIDAVIT

I, J. F. Groth, being duly sworn, hereby depose and say that I am Vice President, Nuclear Generation, of Houston Lighting & Power Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached proposed changes to Technical Specification 3.3.3.5 and 3.3.3.6; 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.

  
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J. F. Groth  
Vice President,  
Nuclear Generation

STATE OF TEXAS )  
)  
)

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 27<sup>th</sup> day of April, 1995.

  
\_\_\_\_\_  
Linda Rittenberry  
Notary Public in and for the  
State of Texas



## **ATTACHMENT 2**

### **SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION FOR PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS 3.3.3.5 AND 3.3.3.6 REGARDING REQUIRED CHANNELS OF CORE EXIT THERMOCOUPLES**



## **Background**

The Technical Specifications for the South Texas Project, Units 1 and 2, contain requirements for the operability of the core exit thermocouples in Specification 3.3.3.5 for Remote Shutdown, and in Specification 3.3.3.6 for Accident Monitoring Instrumentation. In this proposed amendment, Houston Lighting & Power intends to revise the affected specifications to be consistent with the requirements of NUREG 1431, "Standard Technical Specifications - Westinghouse Plants".

## **Proposed Change**

Houston Lighting & Power proposes to change Technical Specification 3.3.3.5, "Remote Shutdown" and its associated tables to eliminate the references to the core exit thermocouples. The core exit thermocouples are adequately governed by the requirements in Technical Specification 3.3.3.6.

Houston Lighting & Power proposes to change Technical Specification 3.3.3.6, "Accident Monitoring Instrumentation" and its associated tables to require two channels of core exit thermocouples to be OPERABLE, where each channel will be required to have at least two thermocouples per quadrant in order to be OPERABLE. In addition, each channel must have at least four operable thermocouples in at least one quadrant to support the operability of the subcooling margin monitors. The Bases for the new OPERABILITY requirements will add restrictions as to which thermocouples must be OPERABLE. These restrictions require one thermocouple to be located near the center of the core and the other near the core perimeter, such that the pair of thermocouples indicate the radial temperature gradient across their core quadrant.

The proposed change to Technical Specification 3.3.3.6 will establish an ACTION to make a report to the Region after one of two core exit thermocouple channels in a quadrant has been inoperable for more than 30 days, require the plant to go to HOT SHUTDOWN if both core exit thermocouple channels in a quadrant are inoperable for more than 7 days. The note describing the core exit thermocouples in Table 3.3-10 is revised to be consistent with the descriptions above.

The changes described above are incorporated in the annotated Technical Specification pages in Attachment 3.

### **Safety Evaluation for Technical Specification 3.3.3.5**

Houston Lighting & Power proposes to remove the operability for core exit thermocouple from Technical Specification 3.3.3.5. The operability of the core exit thermocouples is adequately and appropriately addressed by Technical Specification 3.3.3.6 for Accident Monitoring Instrumentation.

The basis for the Remote Shutdown Technical Specification is to assure the operability of equipment required to shutdown the reactor in the event that a fire makes the control room uninhabitable. An Auxiliary Shutdown Panel in each of the South Texas Project units provides a remote location for the controls and instrumentation required to effect a shutdown from outside the affected unit's main control room. The Auxiliary Shutdown Panel is equipped with the Qualified Display Parameter System displays that provide normal Reactor Coolant System temperature monitoring instrumentation used for shutdown. The core exit thermocouple indications are available on the Qualified Display Parameter System. The core exit thermocouples are the normal indications used for monitoring Reactor Coolant System temperature to confirm natural circulation cooldown, which is implemented during shutdown from outside the control room. As described in the excerpt from the South Texas Project Fire Hazards Analysis Report, below, the core exit thermocouples can be used in conjunction with the Reactor Coolant System loop temperature monitoring channels.

"RCS temperature indication of the rate of RCS cooldown can be accomplished by monitoring either hot or cold leg temperature. RCS hot leg temperature instrumentation (Train D) is provided in each of the four hot legs while cold leg temperature indication (Train B) is provided in each of the four cold legs. A third means of monitoring RCS temperature is by using the core exit thermocouples (Trains A and C) to indicate the coolant temperature at various points as it exits the reactor core. The availability of any one of the above three means of temperature indication provides an acceptable means of monitoring the rate of RCS cooldown. These temperature indications are provided in the control room and at the auxiliary shutdown panel."

The loop temperature indications are provided on the same Qualified Display Processing System plasma displays at the Auxiliary Shutdown Panel as the core exit thermocouples, and are governed by Technical Specification 3.3.3.5, Item 3. Consequently, the surveillance for the loop temperature indication adequately demonstrates the operability of the plasma displays, and if the plasma displays are available it can be concluded that the core exit thermocouple indication is also available.



The core exit thermocouples are primarily accident monitoring instrumentation, and they are appropriately governed by Technical Specification 3.3.3.6, "Accident Monitoring Instrumentation". Design basis accidents are not postulated to occur concurrent with a fire or a shutdown from outside the control room. Consequently, there is no credible event for which the core exit thermocouples would be required to be operable for post-accident monitoring at the Auxiliary Shutdown Panel.

It can be concluded that the operability of the core exit thermocouples indication at the Auxiliary Shutdown Panel is adequately shown by the operability of the Qualified Display Processing System displays for other Remote Shutdown instrumentation, and Technical Specification 3.3.3.6 adequately assures the availability of the remaining parts of the thermocouple system. Therefore, eliminating the reference to the core exit thermocouples from Technical Specification 3.3.3.5 is safe and appropriate because it results in no loss of capability and it eliminates unnecessarily redundant references in the Technical Specifications.

#### **Safety Evaluation for Technical Specification 3.3.3.6**

Houston Lighting & Power proposes to change the requirements of Technical Specification 3.3.3.6 to be consistent with those of NUREG 1431, "Standard Technical Specifications - Westinghouse Plants".

The proposed changes to the Accident Monitoring Instrumentation specification will not have a significant effect on the safety of operations of the South Texas Project. Houston Lighting & Power is not proposing to reduce the capability of the station's systems to mitigate any accident, or create any condition that increases the likelihood of an accident.

The purpose of the core exit thermocouples is to enable the operator to assess core cooling after an accident. In the event of an accident, the core exit thermocouples provide the operators with indications on the status of the Core Cooling Critical Safety Function. They are the primary indicators for entry into loss of core cooling mitigation procedures. Wide range Reactor Coolant System temperature indication and Reactor Vessel Water Level indication provide the operator with backup information to assess core cooling, as described in Chapter 7B to the South Texas Project Updated Final Safety Analysis Report. The backup instrumentation is unaffected by this requested amendment.

Reducing the number of core exit thermocouples required per quadrant per channel from 4 to 2 would have no impact on the Qualified Display Processing System Reactor Coolant System Subcooling Margin Monitor calculation since the minimum number of valid thermocouples per quadrant (four or five) would still be met. The Qualified Display Processing System interprets thermocouple input based on quadrant and does not distinguish between train inputs.

As long as there is one quadrant with four (4) or more valid thermocouples the Qualified Display Processing System will calculate Reactor Coolant System subcooling. Consequently, the subcooling margin monitor requirements are not affected by allowing 2 thermocouples/channel/quadrant, as long as each channel has at least four operable thermocouples in any quadrant (e.g., A Train has four operable thermocouples in one of the quadrants, and C Train has four operable thermocouples in the same quadrant or any other quadrant.). This preserves the ability to withstand a single failure. This requirement has been incorporated into the Specification and the Bases.

The changes proposed by Houston Lighting & Power will result in a less restrictive Technical Specification; however, the reliability of the function of the core exit thermocouples will be preserved. The proposal to reduce the requirement for the number of operable thermocouples per channel from four to two does not significantly affect the safety performance. The new OPERABILITY requirements will add restrictions as to which thermocouples must be OPERABLE. These restrictions require one thermocouple to be located near the center of the core and the other near the core perimeter, such that the pair of thermocouples indicate the radial temperature gradient across their core quadrant. The Bases are being revised accordingly.

The existing specification allows for 31 days in the case where there are less than four thermocouples per quadrant per train operable, 7 days where there are less than 6 thermocouples per quadrant, and 48 hours where there are less than 4 thermocouples per quadrant. Each situation requires a plant shutdown. The proposed specification will require a report to the Nuclear Regulatory Commission in the case where one channel of core exit thermocouples is inoperable for greater than 30 days, and will require a shutdown to HOT SHUTDOWN after 7 days if two channels are inoperable. Based on the small likelihood of an accident occurring concurrent with the station being in an ACTION statement with regard to the thermocouples, and the small chance that the degradation of the system in such a situation would significantly affect its functionality, the changes in the allowed outage times are not considered significant. In addition, as noted above, the other indications used for assessing core cooling, Wide Range Temperature and Reactor Vessel Water Level are unaffected by this change request.

Houston Lighting & Power concludes from the evaluation above that there is no significant safety impact from the proposed change to the Accident Monitoring Instrumentation Technical Specifications for the core exit thermocouples.

**No Significant Hazards Considerations Evaluation**

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

Change to Technical Specification 3.3.3.5:

Deleting the reference to the core exit thermocouples from the Remote Shutdown Technical Specification will not involve a significant increase in the probability of an accident previously evaluated because the core exit thermocouples are not potential accident initiators. The consequences of an accident previously evaluated will not be increased because the core exit thermocouples availability is not reduced, since adequate assurance of their operability is provided in Technical Specification 3.3.3.6, and by the surveillance of other indications that require the availability of the displays that also provide the core exit temperatures at the Auxiliary Shutdown Panel.

Change to Technical Specification 3.3.3.6:

The proposed change reduces the number of core exit thermocouples required per quadrant per channel from at least 4 to at least 2. Thus, the Actions when less than 4 thermocouples per quadrant per train are OPERABLE but more than 6 thermocouples per quadrant are OPERABLE, and less than 6 thermocouples per quadrant are OPERABLE but at least 4 thermocouples per quadrant are OPERABLE are being deleted. This change does not affect the probability of an accident. The Accident Monitoring Instruments are not initiators of any analyzed events. The consequence of an accident is not affected by this change. The requirement to have two core exit thermocouples OPERABLE per quadrant per channel is adequate because one OPERABLE core exit thermocouple must be located near the center of the core and the other OPERABLE core exit thermocouple must be located near the core perimeter, such that the pair of core exit thermocouples indicate the radial temperature gradient across their core quadrant. The change will not alter assumptions relative to the mitigation of an accident or transient event. Functions supported by the thermocouples will still be adequately supported by the system. The revised specification provides for at least one quadrant per channel to have at least four operable thermocouples to protect the subcooling margin monitor in the event of a single failure. The other indications used to assess core cooling, as described in Chapter 7B of the South Texas Project Updated Final Safety Analysis Report remain unaffected by the proposed change. Therefore, this change will not involve a significant increase in the probability or consequence of an accident previously evaluated.

The proposed change also affects the allowed outage times for the thermocouples. The existing specification allows for 31 days in the case where there are less than four thermocouples per quadrant per train operable, 7 days where there are less than 6 thermocouples per quadrant, and 48 hours where there are less than 4 thermocouples per quadrant. The required action for each of these cases is a plant shutdown. The proposed specification will require a report to the Commission after 30 days in the case where one channel of core exit thermocouples is inoperable, and it will require the plant to go to HOT SHUTDOWN if two channels are inoperable for more than 7 days. A plant shutdown with only one channel inoperable is not warranted based on the fact that the redundant channel remains available to provide the necessary indication and the passive nature of the instrumentation (i.e., no critical automatic action).

As noted above, the core exit thermocouples are not accident initiators; consequently, the change in allowed outage time does not affect the probability of an accident. The consequences of an accident are not significantly increased because the changes to the allowed outage times are not extended to allow operation of the system in such a degraded condition that it will not perform its function. In addition, the other indications used to assess core cooling, as described in Chapter 7B of the South Texas Project Updated Final Safety Analysis Report remain unaffected by the proposed change. As noted above, functionality of the core exit temperature indication is preserved by requiring at least two thermocouples to be operable in separate regions of the core quadrant.

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

Change to Technical Specification 3.3.3.5:

Deleting the core exit thermocouples from the Remote Shutdown Technical Specification will not create the possibility of a new or different accident because there are no automatic actuations performed by the core exit thermocouples, nor are any different plant configurations or different operational procedures proposed. The existing safety analyses are unchanged and still applicable.

Change to Technical Specification 3.3.3.6:

The proposed change reduces the number of core exit thermocouples required per quadrant per channel from at least 4 to at least 2. Thus, the Actions when less than 4 thermocouples per quadrant per train are Operable but more than 6 thermocouples per quadrant are OPERABLE, and less than 6 thermocouples per quadrant are OPERABLE but at least 4 thermocouples per quadrant are OPERABLE are being deleted. This change will not physically alter the plant (no new or different type of



equipment will be installed). The changes in methods governing normal plant operation are consistent with current safety analysis assumptions. Therefore, the change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The change in the allowed outage time does not alter the physical configuration of the plant or how the plant is operated; consequently, this change does not create the possibility of a new or different kind of accident.

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

Change to Technical Specification 3.3.3.5:

Deleting the core exit thermocouples from the Remote Shutdown Technical Specification does not involve a significant reduction in the margin of safety because the core exit thermocouples indications will still be available at the Auxiliary Shutdown Panel. In addition, adequate and appropriate assurance of the operability of the core exit thermocouples is provided in Technical Specification 3.3.3.6 for Accident Monitoring Instrumentation, including the changes proposed in this letter.

Change to Technical Specification 3.3.3.6:

The proposed change reduces the number of core exit thermocouples required per quadrant per channel from at least 4 to at least 2. Thus, the Actions when less than 4 thermocouples per quadrant per train are Operable but more than 6 thermocouples per quadrant are OPERABLE, and less than 6 thermocouples per quadrant are OPERABLE but at least 4 thermocouples per quadrant are OPERABLE are being deleted. The margin of safety is not affected by this change. The Accident Monitoring Instrumentation provide no automatic actuation functions. Even though the number of core exit thermocouples per quadrant per channel is being reduced, the Bases requirement to have one core exit thermocouple located near the center of the core and one core exit thermocouple located near the core perimeter ensures that the pair of core exit thermocouples indicate the radial temperature gradient across their core quadrant which ensures the required level of information is available. The functions dependent on the core exit thermocouples are still adequately supported by the thermocouples. The revised specification provides for at least one quadrant per channel to have at least four operable thermocouples to protect the subcooling margin monitor in the event of a single failure. In addition, the other indications used to assess core cooling, as described in Chapter 7B of the South Texas Project Updated Final Safety Analysis Report remain unaffected by the proposed change. The safety analysis assumptions will still be maintained, thus, no question of safety exists. Therefore, the change does not involve a significant reduction in a margin of safety.

The proposed changes to the allowed outage times have no significant impact on the margin of safety. A plant shutdown with only one channel inoperable is not warranted based on the fact that the redundant channel remains available to provide the necessary indication and the passive nature of the instrumentation (i.e., no critical automatic action). Based on the small likelihood of an accident occurring concurrent with the station being in an ACTION statement with regard to the thermocouples, and the small chance that the degradation of the system in such a situation would affect its functionality, and the diversity provided by other indications of core cooling, the changes in the allowed outage times are not considered significant.