NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
South Texas Unit 2	05000 499	1 OF 6

TITLE (4) Incorrect Application of Static Shift to Pressurizer Level Channel LT-0467

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	31	95	95	-- 002 --	01	03	09	95		05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Jairo M. Pinzon - Staff Engineer	(512) 972-8027

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
D	AB	LT	WIZO	NO						

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 31, 1995, Unit 2 was in Mode 1 at 100% power. At 0943 hours, an operability review determined that pressurizer level channel LT-0467 should be considered inoperable due to the use of an incorrect calibration correction factor. Technical Specification requirements had not been met in that the inoperable channel had not been placed in trip within six hours following the incorrect calibration that made the channel technically inoperable. The cause of the event was incorporation of an improper calibration step into the calibration procedure. Corrective actions are described within this Licensee Event Report. This occurrence had no safety significance.

DESCRIPTION OF EVENT:

On January 26, 1995, at 1000 hours, Unit 2 was in Mode 1 at 100% power. During review of a calibration procedure as part of a surveillance procedure enhancement program, an error was discovered in which static shift correction had been applied to both input and output signals of Unit 2 pressurizer level transmitter B2RC-L-0467. This resulted in the channel being technically inoperable since late 1989.

On September 28, 1989, a work request was issued because channel LT-0467 was indicating more than 5% difference from the other three pressurizer level channels. Transmitter replacement was ordered and instructions were provided to apply static shift corrections to the test input signal of the transmitter. A field change was initiated on October 3, 1989 to update the procedure to specify application of the static shift to the test input signal of the transmitter. However, it was not recognized that the calibration procedure already included a static shift correction applied to the output signal of the transmitter. As a result, the transmitter was replaced (on October 4, 1989) and returned to service with the transmitter technically inoperable due to the static shift correction of both input and output signals.

The first aspect of this occurrence was failure to properly use the static shift correction which resulted in a technically inoperable level transmitter. At the time of the occurrence, the method for implementing changes to procedures due to component change-out consisted of changing components using Service Request work instructions and initiating a field change to the implementing procedure before Service Request closeout. Technicians were not required to evaluate the procedure and scaling document to ensure static shift was correctly applied. Technicians were not familiar with the process required to ensure proper incorporation into procedures.

The second aspect of this occurrence was failure to identify the error during subsequent reviews of the procedure. At the time of this occurrence, scaling documents existed, but had not been kept up-to-date in all cases. As a result, the scaling documents were decontrolled in December 1989 and the calibration procedures were designated the controlling document. The static shift correction included in the transmitter calibration procedure thus became the controlled scaling information. Subsequent revisions of the procedure did not identify the static shift of both input and output signals.

The error in calibrating transmitter B2RC-L-0467 was identified in January 1995 during the surveillance procedure enhancement project. On January 31, 1995, an operability review determined that the channel should be declared technically "inoperable" due to this inadequate calibration and the affected channel was placed in the trip condition in accordance with the Technical Specification requirements. The remaining three level transmitters were determined to be operable. The Nuclear Regulatory Commission was notified at 0853 hours on February 1, 1995, after review of the work history determined that the channel had been technically inoperable since 1989.

CAUSE OF EVENT:

The cause of this event was the process for incorporating changes to procedures due to component replacement was less than adequate.

Absence of a controlled scaling document and inconsistent methods used to determine static shift corrections were contributing factors.

ANALYSIS OF EVENT:

Failure to place an inoperable pressurizer level channel in trip within the required Technical Specification time limit is reportable pursuant to 10CFR50.73(a)(2)(i)(B). The channel had been left in a technically inoperable state due to improper calibration; consequently, Technical Specification 3.3.1 Action 6 was not met in that the inoperable channel was not placed in the tripped condition within six hours. It should be noted that frequent comparisons of pressurizer level were made. The level indicated was consistent with that displayed on the other channels.

As indicated in the following analysis, the event had no safety significance:

Pressurizer level channel LT-0467 is one of four channels used to monitor pressurizer level. Protective circuit actuation for pressurizer level occurs when two out of four channels exceed the high pressurizer level limit. Following discovery of the improper calibration, channel LT-0467 was placed in the tripped condition per Technical Specification 3.3.1 Action 6. Action 6 allows continued operation with three operable pressurizer level channels provided the inoperable channel is placed in the tripped condition within six hours, and the Minimum Channels OPERABLE requirement is maintained. The work packages for the remaining three level transmitters were reviewed and showed no errors.

As stated in Technical Specification Table 2.2-1, pressurizer level has a trip setpoint of 92%, with a Technical Specification allowable value of 93.6%. The miscalculation could have resulted in exceeding the allowable value by 0.9%. Reactor trip is assumed in the safety analysis to occur at a high pressurizer water level of 92% with a 6.1% instrument uncertainty for an effective level trip setpoint of 98.1%.

The high pressurizer water level reactor trip is used to protect the reactor coolant system from overpressurization due to a water solid condition. A review of the Updated Final Safety Analysis Report shows that the only event which takes credit for the high level trip is the Chemical and Volume Control System malfunction event described in Section 15.5.2. This event assumes that the controlling level transmitter fails low which results in the maximum charging flow to the reactor coolant system. A second transmitter is assumed to fail, thus leaving two channels to provide the high pressurizer water level reactor trip on two out of four coincidence.

Another concern of this event is the potential for water discharge through the pressurizer relief tank if the pressurizer fills. If the capacity of the pressurizer relief tank is not large enough, there may be radiological consequences due to spillage of primary system water from the pressurizer relief tank to the containment.

ANALYSIS OF EVENT: (Continued)

The potential for the pressurizer to become water solid occurs twice for this event. The first time occurs when the pressurizer water level reaches the high level trip setpoint. An increase in the pressurizer level trip setpoint can potentially result in the pressurizer becoming water solid. After the reactor trips, the associated reduction in reactor coolant system temperature results in rapid reduction in pressurizer level. The second time for the pressurizer to become water solid occurs after the reactor trip if charging is not secured. If charging is not secured, pressurizer water level will continue to increase until the operator secures charging or the pressurizer becomes water solid.

To evaluate the potential for the pressurizer to become water solid prior to the reactor trip, the impact of the increase in the allowable value was assessed. By applying the additional 0.9% to the 98.1% setpoint used in the safety analysis, the effective setpoint would be 99%. Assuming the maximum flow associated with these conditions 57.71 lbm/sec, a two-second trip delay time, and 2.8 seconds for the rods to drop into the core, the maximum pressurizer water level would be less than 99.1%. Therefore, the pressurizer would not become water solid prior to the reactor trip.

To evaluate the potential for the pressurizer to become water solid after the reactor trip, the impact of the increased effective setpoint was again evaluated. The current analysis shows that the operators have sufficient time with reactor trip occurring at 98.1% pressurizer water level to take corrective actions to prevent the pressurizer from becoming water solid. The success criterion for this analysis is that the pressurizer must not become water solid within 609 seconds following initiation of the event. The 609 seconds account for operator action time and time for the charging valve to stroke closed. Although the South Texas Project typically operates only one charging pump at a time, the current safety analysis also assumes that both centrifugal charging pumps and the positive displacement pump are operating to provide the maximum charging flow.

The worst case scenario for this event assumes pressurizer sprays operating, no operator action, and minimum reactivity feedback. Prior to reactor trip, pressurizer pressure is approximately 2300 psia. The maximum charging flow at 2300 psia is approximately 57.71 lbm/sec. For this case, the analysis shows the pressurizer would become water solid in 10.23 minutes (614 seconds).

The amount of flow from the centrifugal charging pumps decreases as reactor system pressure increases. With the higher effective setpoint, the time for a reactor trip would be delayed, which would result in the reactor coolant system being at a higher pressure for a longer period of time. This would result in a slight decrease in the rate of charging flow into the reactor coolant system. Therefore, the pressurizer water level would be slightly lower for the same operator action time assumed in the Chapter 15 safety analysis.

Based upon the above, miscalibration of the pressurizer level transmitter has no safety significance.

CORRECTIVE ACTIONS:

The following corrective actions have been taken or will be taken as a result of this event.

1. An up-to-date controlled scaling document has been provided for the affected pressurizer level transmitter.

2. Channel LT-0467 was calibrated using an updated scaling document. The channel was declared operable on February 1, 1995 at 0228 hours.

3. A training session has been conducted for maintenance procedure writers to emphasize the necessity and importance of performing a detailed review of changes to procedures when technical data is altered.

4. To ensure consistent application of static shift, criteria have been established for transmitters requiring static shift adjustment.

5. The work packages for the remaining three level transmitters were reviewed and showed no errors.

6. Guidelines have been developed establishing a controlled method for determining and applying static shift corrections.

7. Crew discussions were conducted to ensure Instrumentation & Control craft personnel are familiar with established means of static shift correction and their proper application.

8. The scaling database will be revised to allow for input of transmitter serial number and static shift corrections for affected transmitters. The expected completion date is December 15, 1995.

9. Historical data for safety-related transmitters requiring static shift correction has been reviewed to determine if similar instances of error have occurred during replacement. No discrepancies were identified.

ADDITIONAL INFORMATION:

As indicated in the description, at the time of this occurrence, the method for implementing changes to procedures due to component change-out consisted of changing components using Service Request work instructions and initiating a Field Change to the implementing procedure before Service Request closeout. The method currently used is to make changes within the scope of the work instructions and not require performance of the implementing procedure to satisfy operability. Completed work package instructions and scaling documents are forwarded to the procedure group for evaluation and proper incorporation into the procedure.

ADDITIONAL INFORMATION: (Continued)

South Texas Project initiated development of a Scaling Database in 1994. This effort was deemed necessary, in part, as a result of conclusions drawn from the Surveillance Procedure Enhancement Program. Development of a Scaling Database is included in the 1995 Business Plan and is scheduled for completion in 1997. This database will ensure that future procedure revisions will have the latest controlled scaling information for instrument calibrations.

Licensee Event Report 89-015 for Unit 2 documented an entry into Technical Specification 3.0.3 due to concurrent inoperabilities of two of the four pressurizer level channels on May 12, 1989. Channel LT-0467 had been declared inoperable for troubleshooting and repair because it was reading slightly higher than the other channels. The transmitter was determined to have an out-of-tolerance static shift, and was subsequently replaced, calibrated, and returned to service.