Log # TXX-92047
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Ref. # 50.73(a)(2)(vii)

January 24, 1992

William J. Cahill, Jr.
Group Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NO. 50-445
INOPERABLE TRAIN/CHANNEL IN SAFETY RELATED SYSTEM
LICENSEE EVENT REPORT 91-032-00

Gentlemen:

Enclosed is Licensee Event Report 91-032-00 for Comanche Peak Steam Electric Station Unit 1, "Procedure Error Leading to Miscalibration of Power Range Nuclear Instrumentation Channels".

Please note, this report is submitted approximately two weeks late. The initial review of this event recognized a reactor trip setpoint had been approached as a result of this error, but because no actuation occurred, reportability was not obvious. Subsequent evaluations identified the impact of incomplete calibration on the reactor trip system power range setpoint and the revised conclusions of reportability. The fact that the report is being submitted late was not identified until the final review process wherein the resident staff was promptly informed. The circumstances associated with the late submittal of the attached report have been discussed with the personnel involved.

Sincerely,

William J. Cahill, Jr.

JET/fds

Attachment

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (2)

IE22 1/1

Enclosure to TXX-92047

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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Title (4)

PROCEDURE ERROR LEADING TO NONCONSERVATIVE MISCALIBRATION OF POWER RANGE NUCLEAR INSTRUMENTATION CHANNELS

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 Names	Docket Numbers
1 2	0 6	9 1	9 1 -	0 3 2 -	0 0	0 1	2 4	9 2	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

Operating Mode (9): 3

Power Level (10): 0 1 0 0

This report is submitted pursuant to the requirements of 10 CFR § (Check one or more of the following) (11)

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

Licensee Contact For This LER (12)

Name	Telephone Number (Area Code)
D.E. BUSCHBAUM COMPLIANCE SUPERVISOR	8 1 7 8 9 7 - 5 8 5 1

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	

Supplemental Report Expected (14)

- [ ] Yes (If yes, complete Expected Submission Date)
- [X] No

Expected Submission Date (15): Month | Day | Year

Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On December 6, 1991, an Instrument and Control technician performed calibration activities on the four power range channels of the nuclear instrumentation system. An error in the work instructions resulted in incomplete calibration of the four channels and nonconservative indication of reactor power. On December 11, following synchronization of the turbine-generator with the grid, the shift supervisor observed a discrepancy between indicated and actual plant conditions based on previous experience with the evolution. Performance of a unit calorimetric confirmed the inconsistency between the indicated reactor power of 9% and actual power of 17%. The cause of the event was a procedure error, and corrective actions include procedure revision and training.

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Text (If more space is required, use additional NRC Form 366A's) (17)

I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single safety related system.

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On December 6, 1991, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 3, Hot Standby, in preparation for plant startup following the first refueling outage.

On December 11, 1991, CPSES Unit 1 was in Mode 1, Power Operation, with the reactor at approximately 17 percent of rated thermal power.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

At the time of event discovery, four channels of the power range nuclear instrumentation (EIIS:(IG)) had been miscalibrated such that the low setpoint power range reactor trip would not have occurred at twenty-five percent of rated thermal power.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

On December 6, 1991, an Instrument and Control (I&C) technician (utility, non-licensed) performed a channel calibration on the four power range (PR) channels of the Nuclear Instrumentation System (NIS). The calibration was being performed to account for the expected reduced neutron leakage following refueling. The work was performed in accordance with surveillance work orders planned and initiated by the I&C group. The work orders contained instructions to perform selected sections

of the I&C procedure used to verify the accuracy of signal processing equipment in two power range nuclear instrumentation channels. An error in the wording of the work order instructions caused the technician to omit adjustment of the summing amplifier (EIIS:(AMP)(IG)) sections of the circuits.

On December 11, 1991, control room personnel were performing activities required to synchronize the turbine-generator (EIIS:(TG)(TB)) with the grid. The shift supervisor (utility, licensed) observed that indicated reactor power was inconsistent with expected indications for plant conditions based on previous experience with the evolution. The shift supervisor directed that a unit calorimetric be performed prior to increasing power. At approximately 1238 CST, test results confirmed a discrepancy between indicated reactor power of 9 percent and actual power of 17 percent.

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR PROCEDURAL OR PERSONNEL ERROR

After the turbine-generator was synchronized with the grid, the shift supervisor recognized that indicated reactor power level was inconsistent with expected indication based on previous experience with the evolution.

An error in the wording of the instructions on the surveillance work order was discovered during evaluation of the event. During performance of the evaluation, it was recognized that the event could meet the reporting criteria of 10CFR50.73. On December 30, 1991, the evaluator contacted the Compliance Group to discuss reportability, and following review of the 10CFR50.73 reporting criteria, it was determined that a Licensee Event Report (LER) should be submitted.

II. COMPONENT OR SYSTEM FAILURES

A. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

There were no failed components that contributed to the event.

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Text (If more space is required, use additional NRC Form 366A's) (17)

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

There were no failed components that contributed to the event.

C. SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURE OF COMPONENTS WITH MULTIPLE FUNCTIONS

There were no failed components that contributed to the event.

D. FAILED COMPONENT INFORMATION

There were no failed components that contributed to the event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

There was no safety system responses that occurred as a result of this event.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

The power range reactor trip system instrumentation channels were non-conservatively miscalibrated from December 6, 1991, when the channel calibrations were incompletely performed, until completion of recalibration at approximately 1200 CST on December 11, 1991. CPSES Unit 1 Technical Specifications require that the power range reactor trip system instrumentation low setpoint trip be operable in Mode 2, Startup, and in Mode 1, Power Operation, below the P-10 setpoint. Unit 1 was declared to be in Mode 2 on December 7, 1991, at 1450 CST.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

Miscalibration of the power range NIS channels resulted in nonconservatively inaccurate indication of reactor power and an increase in the low setpoint power range reactor trip above the specified value of 25 percent. Actual thermal power as indicated by core delta temperature, steam temperature, and electrical output was higher than indicated, although precise differences cannot be determined due to the

low power level at which the discrepancy was noted and the inaccuracies inherent in the measurement devices at such low power levels. Protection against power escalation high into the intermediate range was still provided by the intermediate range (IR) high setpoint trip and the IR rod stop. Additionally, the PR high overpower trip was conservatively set as a procedural requirement in consideration of uncertainties in the nuclear instruments upon starting up with a new core load.

The procedure in use by Control Room personnel at the time of discovery contains precautions and procedure steps directing the operator to compare indicated power and thermal process indications such as core delta temperature and steam temperature at several points during the startup. Additionally, steps within the procedure require operators to check indicated power against calculated power by performing a unit calorimetric at several power levels prior to reaching full power. The first calorimetric would have been performed at an indicated power of 15% if the discrepancy had not been recognized earlier. It is concluded that the event did not present a risk to the safe operation of CPSES Unit 1 or the health and safety of the public.

IV. CAUSE OF THE EVENT

A. ROOT CAUSE

The root cause of the event has been determined to be an error in the wording of the work order instructions. The work order instructs the technician to "perform ion current gain section" of the referenced I&C procedure The work order should have instructed the technician to perform the "Intercept Current Alignment" section of the procedure, which includes subsections for Ion Current Gain and Summing Amp Gain. Performance of the work instruction as written resulted in the omission of steps necessary to adjust the summing amplifier portion of the power range NIS circuitry.

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B. CONTRIBUTING FACTORS

1. The I&C work planner (utility, non-licensed) did not recognize the significance of the work instruction wording. The work activity is performed on a non-routine basis by I&C at the request of the Station Nuclear Engineering (SNE) Group. SNE provides calibration data and indicates which section of the related I&C procedure should be performed. On November 11, 1991, calibration data was provided to I&C along with instructions to perform an intercept current alignment. The I&C planner generated a work order for the activity from the automated surveillance database, but did not recognize that the wording of the instruction on the work order differed from the wording of the SNE calibration sheet.

2. The error in the work instruction was not documented during previous performance of the calibration. During previous adjustments, the I&C technician performing the activity had requested Control Room personnel to perform a unit calorimetric following completion of work instruction steps. The test procedure for the calorimetric contains a section for adjusting the summing amp gain. The technician recognized the requirement to perform the summing amp gain adjustment, and his knowledge of the process precluded omission of the steps necessary to complete the calibration. Information about the inconsistent wording of the work order instruction was not fed back to planning and scheduling personnel. On December 6, 1991, a different technician performed the calibration, and he completed the work instructions as written, without an awareness of the additional actions necessary to complete adjustment of the summing amp.

V. CORRECTIVE ACTIONS

Cause : incorrect work order instructions

Action : The work activity instruction steps have been revised in the surveillance database to ensure that all required procedure sections are performed. The related I&C procedures will be revised to clarify which sections are to be performed and to simplify the procedure steps.

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Contributing factor : work planning weakness

Action : Training will be administered to the appropriate I&C personnel to clarify the steps required to complete the calibration activity and to emphasize the lessons learned from the event evaluation.

Contributing factor : work instruction error not documented

Action : I&C training will stress the importance of proper feedback to ensure corrections and enhancements are made to the affected documents. Reliance on existing mechanisms for that feedback will be emphasized and encouraged.

VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar events reported pursuant to 10CFR50.73.