TU ELECTRIC

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Ref. # 10CFR50.73(r)(2)(iv)

November 20, 1992

William J. Cahill, Jr.
Group Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
MANUAL OR AUTOMATIC ACTUATION OF ANY ENGINEERED SAFETY FEATURE
LICENSEE EVENT REPORT 92-025-00

Gentlemen:

Enclosed is Licensee Event Report (LER) 92-025-00 for Comanche Peak Steam Electric Station Unit 1, "Equipment Failure Results in the Drop of Four Control Bank B Group 1 Control Rods and a Manual Reactor Trip.

Sincerely,

William J. Cahill, Jr.

William J. Cahill Jr.

Roger D. Walker

Roger D. Walker
Manager of Regulatory Affairs
for NEO

JET/tg

Enclosure

c - Mr. J. L. Milhoan, Region IV
Resident Inspectors, CPSES (2)

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TXX-92566

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)

EQUIPMENT FAILURE RESULTS IN THE DROP OF FOUR CONTROL BANK B GROUP 1 CONTROL RODS AND A MANUAL REACTOR TRIP

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 Number(s)
1 0	2 3	9 2	9 2	- 0 2 5	- 0 0	1 1	2 3	9 2	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

Operating Mode (9): 2

Power Level (10): 0 0 2

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)
- [X] 50.73(a)(2)(iv)
- [ ] 50.73(a)(2)(v)
- [ ] 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	Area Code	Telephone Number
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	
X	A A	C B D	W 1 2 0	Y							

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)

At 1042 on October 23, 1992, a Control Rod Urgent Failure Alarm was received. At 1100, Instrumentation and Control (I&C) technicians were dispatched to troubleshoot the cause of the alarm. At 1115, I&C technicians noted a possible failure of the Bank Overlap Card A206. The I&C technicians replaced A206 and had the Reactor Operator (RO) reset the alarm. To verify proper operation of A206, the I&C technicians asked the RO to select a Control Rod Bank. The RO selected Control Rod Bank B and an Urgent Failure Alarm was again received. At 1420, the RO again reset the alarm. Upon resetting the alarm several other alarms were immediately received. The Digital Rod Position Indication System indicated that Control Rod Bank B, Group 1, had four control rods that had dropped. The RO manually tripped the reactor.

Data collected after the event indicated that Bank Overlap Card Logic 2 A207 had failed, and the A206 was not the problem. In a previous configuration, inadequate cooling of the affected Rod Control Cabinet increased the probability of failure of A207. Corrective actions include replacing A207, as well as vendor refurbishment of the Unit 1 and Unit 2 Rod Control Systems.

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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 or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)(EIIS:(JC)).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On October 23, 1992, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 2, Startup, with reactor power at approximately 2 percent.

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

There were no inoperable structures, systems or components that contributed directly to the event.

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

At 1039 on October 23, 1992, CPSES Unit 1 commenced a reactor shutdown for a scheduled outage. At 1042, with the reactor subcritical, the Reactor Operator (RO) (utility, licensed) placed the Control Rod IN/OUT Switch (EIIS:(HS)(AA)) to the IN position and a Control Rod Urgent Failure Alarm was received. The Control Rod Bank Selector Switch (EIIS:(HS)(AA)) was in manual and the four Control Rod Banks (EIIS:(ROD)(AA)) were aligned as follows: Bank A at 230 steps; Bank B at 230 steps; Bank C at 115 steps; and Bank D at 8 steps. At 1049, the RO began borating the Reactor Coolant System (RCS) (EIIS:(AB)). At 1050, the RO verified that the Source Range Nuclear Instrumentation (EIIS:(RI)(JC)) had energized and that the reactor had entered the source range.

At 1100 on October 23, 1992, Instrumentation and Control (I&C) technicians were dispatched to troubleshoot the cause of the alarm. The RO had reported the alarm was in Rod Control Cabinet (EIIS:(CAB)(AA)) 1BD. At 1115, I&C technicians began troubleshooting Cabinet 1BD; a multiplexing error was indicated as the cause of the alarm, with the possible failure of the Bank Overlap Card (EIIS:(CBD)(AA)) A206. The RO then reset the Urgent Failure Alarm, at the request of the I&C technicians. At 1400, the I&C technicians replaced A206. To verify proper operation of A206, the I&C technicians asked the RO to select a Control Rod Bank on the Control Rod Bank Selector Switch. When the RO selected Control Rod Bank B an Urgent Failure Alarm was again received on 1BD. At 1420, at the request of the I&C technicians, the RO reset the

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

Urgent Failure Alarm. Upon resetting the alarm several other alarms were immediately received. The Digital Rod Position Indication (DRPI) System (EIIS:(ZI)(AA)) indicated that Control Rod Bank B, Group 1, had four control rods that had dropped. The RO manually tripped the reactor and entered the Emergency Operating Procedures (EOP). At 1426, with the reactor in MODE 3, the RO exited the EOPs and resumed the reactor shutdown.

An event or condition that results in an automatic or manual actuation of any ESF, including the RPS, is reportable within 4 hours under 10CFR50.72(b)(2)(ii). At 1528 on October 23, 1992, the Nuclear Regulatory Commission Operations Center was notified of the event via the Emergency Notification System.

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

At 1042 on October 23, 1992, the RO received an Urgent Failure Alarm on the Main Control Board (EIIS:(MCBD)(IB)). I&C was dispatched to troubleshoot. At 1420, at the request of I&C, the RO reset the Urgent Failure Alarm and immediately received several other alarms. DRPI indicated that four Bank B, Group 1 control rods had dropped.

II. COMPONENT OR SYSTEM FAILURES

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

An evaluation team was formed to further troubleshoot the Rod Control System (EIIS:(AA)) as well as to perform a test of the logic circuitry. Data collected indicated that the Bank Overlap Logic 2 Card (EIIS:(CBD)(AA)) A207 had failed and that A206 was not the problem. A thorough checkout of A207 to determine the failure mode and mechanism was conducted.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

In a previous configuration, inadequate interior cooling of the affected Rod Control Cabinet increased the probability of failure of A207.

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

Not applicable - no failures of components with multiple functions have been identified.

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D. FAILED COMPONENT INFORMATION

Bank Overlap Logic 2 Card

A207
Manufacturer: Westinghouse
Model Number: 3361C01G01

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Not applicable - there were no safety system actuations associated with this event.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Not applicable - there were no safety systems which were rendered inoperable due to a failure.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

This event is bounded by the accident analysis in Chapter 15.4 of the Final Safety Analysis Report for a dropped Rod Control Cluster Assembly (RCCA). This analysis demonstrates that the Departure from Nucleate Boiling (DNB) acceptance criteria would not be violated. In this analysis the potential for fuel damage is assessed by comparing the minimum DNB ratio (DNBR) to the DNBR acceptance criterion. For this event, the calculated DNBR is more greatly influenced by the ensuing core power and peaking factors. Because the Rod Control System will act to maintain a relatively high core power following the dropped RCCA(s), the most severe transients result if the Rod Control System is in the automatic mode of operation with the rods initially at the power-dependent insertion limits.

In the analysis of the dropped RCCA event, the possible combinations of RCCAs considered are limited by the design of the Rod Control System to a single group from a power cabinet. The drop of a two group bank or two or more groups from different bank is not considered because a single failure could not initiate these events.

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Because this event occurred from a subcritical condition, and all other system parameters were in their nominal operating range (four Reactor Coolant Pumps (EIIS:(P)(AB)) operating, nominal operating temperature and pressure), the dropped RCCA's had no significant effect on any important core parameter. No combination of core power and peaking factors could exist with the core in this configuration which could result in the onset of DNB. Therefore, this event did not adversely affect the safe operation of CPSES Unit 1 or the health and safety of the public.

IV. CAUSE OF THE EVENT

ROOT CAUSE

The root cause of this event was the failure of A207. An evaluation team was formed to troubleshoot the Rod Control System and to perform a test of the logic circuitry. Data collected indicated that A207 had failed. Upon replacing A207 all problem indications disappeared. An energized checkout test was completed satisfactorily, with the system functioning as expected. A thorough checkout of A207 to determine the failure mode and mechanism was conducted. Review of the history of the Rod Control Cabinets revealed several other card failures; however, no pattern was established. In a previous configuration, inadequate interior cooling of the affected Rod Control Cabinet increased the probability of failure of A207.

V. CORRECTIVE ACTIONS

A. CORRECTIVE ACTIONS TO PREVENT RECURRENCE

ROOT CAUSE

Failure of A207.

CORRECTIVE ACTION

A207 was replaced and the system verified to be functioning as expected.

CONTRIBUTING FACTOR

In a previous configuration, inadequate interior cooling of the affected Rod Control Cabinet increased the probability of failure of A207.

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CORRECTIVE ACTION

The Rod Control System will be refurbished by Westinghouse. This will include a forced current test through the entire system which should detect any other failures. A new baseline for system operability will be established.

Westinghouse will examine other suspect cards with their test equipment, to verify the cards are functioning satisfactorily.

Design modifications have installed temperature monitoring circuits and cabinet fans in the Rod Control Cabinets.

B. CORRECTIVE ACTION TAKEN ON GENERIC CONCERNS IDENTIFIED AS A DIRECT RESULT OF THE EVENT

GENERIC CONCERN

The possibility exists for this event to occur in the CPSES Unit 2 Rod Control System.

CORRECTIVE ACTION

The Unit 2 Rod Control System will be refurbished by Westinghouse. A new baseline for system operability will be established.

VI. PREVIOUS SIMILAR EVENTS

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

VII. ADDITIONAL INFORMATION

The times listed in the report are approximate and Central Daylight Time.