



TU ELECTRIC

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October 9, 1990

William J. Cahill, Jr.
Executive 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
MANUAL OR AUTOMATIC ACTUATION OF ANY ENGINEERED SAFETY FEATURE
LICENSEE EVENT REPORT 90-028-00

Gentlemen:

Enclosed is Licensee Event Report 90-028-00 for Comanche Peak Steam Electric Station Unit 1, "Automatic Reactor Trip Caused by Lightning Strike."

Sincerely,

For William J. Cahill, Jr.

DEN/daj

Enclosure

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

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NRC FORM 366 <h2 style="text-align: center;">LICENSEE EVENT REPORT (LER)</h2>	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.
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Title (4)
AUTOMATIC REACTOR TRIP CAUSED BY LIGHTNING STRIKE

Event Date (5)			LER Number (6)		Report Date (7)			Other Facilities Involved (8)	
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Docket Numbers
09	08	90	90	0218	0101	09	09	90	N/A 0151010101

Operating Mode (9) 1	This report is submitted pursuant to the requirements of 10 CFR 6. (Check one or more of the following) (11)				
Power Level (10) 01318	<input type="checkbox"/> 20.402(b) <input type="checkbox"/> 20.405(a)(1)(i) <input type="checkbox"/> 20.405(a)(1)(ii) <input type="checkbox"/> 20.405(a)(1)(iv) <input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c) <input type="checkbox"/> 50.36(c)(1) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(i) <input type="checkbox"/> 50.73(a)(2)(ii) <input type="checkbox"/> 50.73(a)(2)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv) <input type="checkbox"/> 50.73(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(vi) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 50.73(a)(2)(ix)	<input type="checkbox"/> 73.71(b) <input type="checkbox"/> 73.71(c) Other (Specify in Abstract below and in Text, NRC Form 366A)	

Licensee Contact For This LER (12) Name G. P. McGEE		Telephone Number Area Code 8117		Telephone Number 819171-15141717
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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) <input type="checkbox"/> Yes (If yes, complete Expected Submission Date)			<input checked="" type="checkbox"/> No			Expected Submission Date (15) Month: Day: Year:
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Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 1428 on September 8, 1990, Comanche Peak Steam Electric Station Unit 1 was automatically tripped from 38 percent power. A lightning strike is believed to have caused a surge in the input power resulting in the de-energization of power supplies in the rod drive system, causing the rods controlled by one rod control cabinet to drop into the core. This resulted in the reactor trip from high negative flux rate.

No specific component or system failures were identified as the cause of this event. The installation of surge suppressors in the input supply to rod drive power supplies will provide additional assurance that power supplies remain available during lightning strikes.

NRC FORM 360A U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
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Text (if more space is required, use additional NRC Form 360A's) (17)

I. DESCRIPTION OF THE REPORTABLE EVENT

A. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On September 8, 1990 at 1428, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operation, operating at 38 percent power.

B. REPORTABLE EVENT CLASSIFICATION

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

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

Not applicable - no structures, systems or components were inoperable at the start of the event that contributed to the event.

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

On September 8, 1990, during a lightning storm, two out of ten 25 Voltage Direct Current (VDC) power supply overvoltage protection circuits actuated (located in the rod drive (EIS:(AA)) power cabinets). This actuation resulted in loss of control power to the rod drive system and allowed the rods controlled by the two 25 VDC power supplies to fall into the core. The dropped control rods actuated the Nuclear Instrumentation System (EIS:(JC)) power range high negative neutron flux rate reactor trip. All safety systems responded as expected.

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An event or condition that results in an automatic actuation of any ESF, including the RPS is reportable within 4 hours under 10CFR50.72(b)(2)(ii). At approximately 1618 on September 8, 1990, the Nuclear Regulatory Commission Operations Center was notified of the event via the Emergency Notification System. The plant was stable in Mode 3, Hot Standby.

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

The overvoltage protection for the 25 VDC rod drive power supplies was found tripped upon investigation of a non-urgent alarm on rod drive control cabinet 2AC received at the time of the trip.

II. COMPONENT OR SYSTEM FAILURES

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

Not applicable - no failed components have been identified.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable - no component or system failures have been identified.

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

Not applicable - there were no failed components with multiple functions that affected this event.

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D. FAILED COMPONENT INFORMATION

Not applicable - no failed components have been identified.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

The Reactor Protection System (EIS:(JC)) and Auxiliary Feedwater System (EIS:(BA)) actuated during the event; all associated components within these systems functioned as designed.

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

The event consisted of a multiple control rod drop resulting in a reactor trip. This is bounded by FSAR, Section 15.4.3 and concludes that the successful automatic actuation of the reactor trip will ensure there is no reduction in the margin to core thermal limits and that the Departure from Nucleate Boiling design basis is met. Consequently, there were no adverse impacts to plant safety or the health and safety of the public.

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IV. CAUSE OF THE EVENT

ROOT CAUSE

The initiating cause of this event is a lightning strike on the containment causing a surge in the 120 Voltage Alternating Current (VAC) input power creating a voltage surge in the 25 VDC output of the rod control power supplies. This surge actuated the overvoltage protection circuit on two 25 VDC power supplies which isolated the output of the supply. The loss of this output voltage to the rod control system caused the rods controlled by the affected power supplies to fall.

V. CORRECTIVE ACTIONS

A. IMMEDIATE

The Operator responded appropriately to the RPS actuation. Plant Emergency Operating Procedures were implemented and the plant was stabilized in Mode 3.

B. CORRECTIVE ACTIONS TO PREVENT RECURRENCE

The rod control power supplies tripped from the surge on the 120 VAC input. To prevent this, a design modification to install surge suppressors on the 120 VAC lines feeding for the system has been submitted. The installation of this modification will minimize the potential for an overvoltage trip of the 25 VDC power supplies from a lightning induced surge.

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VI. PREVIOUS SIMILAR EVENTS

Although there have been previous events that resulted in RPS actuation, the root cause of those events were unrelated to the root cause of this event. The corrective actions taken to resolve the root causes of the previous events would not have prevented this event. Therefore, 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 Savings Time (CDT).