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William J. Cahill, Jr.
Executive Vice President

October 10, 1990

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 90-029-00

Gentlemen:

Enclosed is Licensee Event Report 90-029-00 for Comanche Peak Steam Electric Station Unit 1, "Turbine Trip/Reactor Trip Caused by Failure of Personnel to Assure Drain Path is Available."

Sincerely,

A handwritten signature in dark ink, appearing to be "W. J. Cahill, Jr.", written in a cursive style.

For William J. Cahill, Jr.

JRW/daj

Enclosure

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

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NRC FORM 366		U.S. NUCLEAR REGULATORY COMMISSION				APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92			
LICENSEE EVENT REPORT (LER)						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. 20556, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC. 20503.			
Facility Name (1) COMANCHE PEAK - UNIT 1						Docket Number (2) 015101010141415		Page (3) 1 OF 1017	
Title (4) TURBINE TRIP/REACTOR TRIP CAUSED BY FAILURE OF PERSONNEL TO ASSURE DRAIN PATH IS AVAILABLE									
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
09	10	90	90	0219	010	10	10	90	N/A / 015101010111
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) 01912		<input type="checkbox"/> 20.402(b)		<input type="checkbox"/> 20.405(e)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)		<input type="checkbox"/> 73.71(b)	
		<input type="checkbox"/> 20.405(a)(1)(i)		<input type="checkbox"/> 50.36(c)(1)		<input type="checkbox"/> 50.73(a)(2)(v)		<input type="checkbox"/> 73.71(c)	
		<input type="checkbox"/> 20.405(a)(1)(ii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(vii)		Other (Specify in Abstract below and in Text, NRC Form 366A)	
		<input type="checkbox"/> 20.405(a)(1)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)			
		<input type="checkbox"/> 20.405(a)(1)(iv)		<input type="checkbox"/> 50.73(a)(2)(ii)		<input type="checkbox"/> 50.73(a)(2)(vii)(B)			
		<input type="checkbox"/> 20.405(a)(1)(v)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)			
Licensee Contact For This LER (12)									
Name G. P. McGEE						Telephone Number 81117 819171-15141717			
Area Code 81117						Area Code 819171-15141717			
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
B	SIN	IL11IS	MI01410	N					
Supplemental Report Expected (14)									
<input type="checkbox"/> Yes (If yes, complete Expected Submission Date)						<input checked="" type="checkbox"/> No		Expected Submission Date (15)	
Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)									
<p>On September 10, 1990, at 0917 CDT, Comanche Peak Steam Electric Station Unit 1 experienced a reactor trip from Mode 1, Power Operations. The reactor trip was caused by a turbine trip which resulted from a high level condition in the B Moisture Separator Reheater (MSR). The high level in the MSR occurred when an operator attempted to restore a separator drain tank drain valve to service while the drain valve was still isolated. The event was caused by the failure of operators to adequately verify component status prior to returning the component to service. Corrective actions taken include review of the lessons learned package by operators and individual counseling.</p>									

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I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

Any event or condition that results in the manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On September 10, 1990, at 0900, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operations, with reactor power at 92%.

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

The normal drain valve (1-LV-2712) (EISS:(SN)(LCV)) for the 1B Moisture Separator Reheater (MSR) separator drain tank (EISS:(SN)(TK)) was isolated for maintenance.

Level Switch 1-LS-275 (EISS:(SN)(LIS)) which initiates a high level alarm for the 1B MSR separator drain tank was inoperable. This was not discovered until after the event.

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

The separator drain tank receives drainage from the moisture separator section of the MSR. The separator drain tank is provided with a normal and an alternate drain path. Each drain path contains a pneumatically operated drain valve controlled by a controller in the control room. The controller allows the drain valve to be positioned either manually, at the controller, or automatically in response to a signal generated by a level transmitter on the separator drain tank. The drain paths and associated instrumentation and control systems are independent of each other and normally only one drain path is in service.

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Facility Name (1) COMANCHE PEAK - UNIT 1	Docket Number (2) 015101010141415	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3">LER Number (6)</th> <th colspan="3">Page (3)</th> </tr> <tr> <th>Year</th> <th>Sequential Number</th> <th>Revision Number</th> <th></th> <th></th> <th></th> </tr> <tr> <td style="text-align: center;">910</td> <td style="text-align: center;">- 01219</td> <td style="text-align: center;">- 010</td> <td style="text-align: center;">013</td> <td style="text-align: center;">OF</td> <td style="text-align: center;">017</td> </tr> </table>	LER Number (6)			Page (3)			Year	Sequential Number	Revision Number				910	- 01219	- 010	013	OF	017
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On August 28, 1990 a clearance was established to investigate apparent blockage in the normal drain line from the separator drain tank serving the B MSR. The clearance tagged shut the isolation valves upstream and downstream of the normal drain valve (1-LV-2712). The alternate drain path was utilized while the clearance on the normal drain path was in effect.

On September 10, 1990, during the turnover from midnight shift to day shift the off-going Balance of Plant Reactor Operator (BOP RO) (utility licensed) discussed the status of 1-LV-2712 with both the on-coming Unit Supervisor (utility licensed) and the on-coming BOP RO. These discussions included reports from I&C technicians that a leak repair to an instrument line to the level sensor which controlled 1-LV-2712 had been completed. The BOP RO relief check-list stated that the controller for 1-LV-2712 "might work". Based on the above described discussions and check list, the on-coming Unit Supervisor and BOP RO mistakenly assumed that all problems with 1-LV-2712 had been corrected and the normal drain path valve lineup had been restored.

At approximately 0910, in response to questioning by the Unit Supervisor, the BOP RO began attempting to transfer from the alternate drain path to the normal drain path. However, 1-LV-2712 was still isolated. At 0915 a MSR B Flooded alarm (EHS:(SN)(ALM)) occurred. (This alarm was not preceded by a Separator Drain tank high level alarm as would normally be expected). In response to the alarm the BOP RO attempted to reduce level by manually opening the alternate drain valve. Approximately 20 seconds after the MSR B Flooded alarm the turbine tripped due to high level in MSR B. Since power was above the P-9 set point, the turbine trip caused a reactor trip. As a result of the trip, a momentary (approximately 0.3 sec.) lo-lo level condition occurred in the steam generators causing the motor driven auxiliary feed pumps to start. Due to the short duration of the lo-lo level signal the isolation valves for the steam generator blowdown and sampling lines did not close automatically. Operators responded to the trip in accordance with established emergency operating procedures and the plant was stabilized in mode 3. At 1022 the NRC was notified of the event via the Emergency Notification System in accordance with 10CFR50.72.

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<p>E. <u>THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE OR PROCEDURAL ERROR</u></p> <p>The failure of the operators to accurately determine the status of 1-LV-2712, the inadequate written and verbal communications during turnover, and the inoperability of level switch 1-LS-2715 were all identified during the post trip review process.</p> <p>II. <u>COMPONENT OR SYSTEM FAILURES</u></p> <p>A. <u>FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT</u></p> <p>Level switch 1-LS-2715, which provides a high level alarm for the MSR B separator drain tank, failed to actuate. Had this alarm actuated the BOP RO would have been provided with an earlier warning of rising level in the separator drain tank.</p> <p>B. <u>CAUSE OF EACH COMPONENT OR SYSTEM FAILURE</u></p> <p>Failed microswitch within the level switch.</p> <p>C. <u>SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURE OF COMPONENTS WITH MULTIPLE FUNCTIONS</u></p> <p>There were no failed components with multiple functions that affected this event.</p> <p>D. <u>FAILED COMPONENT INFORMATION</u></p> <p>Manufacturer: Magnetrol</p> <p>Model No: B-751-X-MPG</p>								

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III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

The Reactor Protection System (EISS:(JC)) and Auxiliary Feedwater System (EISS:(BA)) actuated during the event. All associated components within these systems functioned as designed. The steam generator blowdown and sampling isolation valves were verified to be operating properly. A technical evaluation demonstrated that the response of the system to such a short duration signal is within design requirements.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

There were no safety systems which were inoperable during this event.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

This event is bounded by the FSAR Section 15.2.3 analysis of a turbine trip. The results of this analysis demonstrate that the turbine trip transient presents no hazard to the integrity of the reactor coolant system, main steam system, or the core.

IV. CAUSE OF THE EVENT

A. ROOT CAUSE

The on-coming operators did not take adequate measures (such as reviewing the clearance records) to ensure that 1-LV-2712 was ready to be returned to service. This is considered a cognitive error.

B. CONTRIBUTING FACTORS

1. The inoperable separator drain tank hi level alarm level switch precluded advance warning of the rising level in the separator drain tank.

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<ol style="list-style-type: none"> 2. Inadequate written and verbal communications between the off-going operators and the on-coming operators contributed to the on-coming operators assumption that 1-LV-2712 was ready to be returned to service. <p>V. <u>CORRECTIVE ACTIONS</u></p> <p>A. <u>IMMEDIATE</u></p> <ol style="list-style-type: none"> 1. The operators responded to the trip per the Emergency Operating Procedures and stabilized the plant in Mode 3. 2. The normal drain valve 1-LV-2712 and its associated flow path were restored to service. 3. Level switch 1-LS-2715 was repaired and restored to service. <p>B. <u>CORRECTIVE ACTIONS TO PREVENT RECURRENCE</u></p> <p><u>Root Cause</u></p> <p>Failure of on-coming operators to adequately ensure that 1-LV-2712 was ready to be returned to service:</p> <p>A lessons learned package identifying the cause of the event was routed to all operators. Additionally, the BOP RO and the Unit Supervisor were individually counselled concerning the event.</p> <p><u>General</u></p> <p>Each Shift Supervisor was counselled by the Manager of Shift Operations concerning this and other recent reactor trips and their causes.</p> <p><u>Contributing Factor 1</u></p> <p>Separator drain tank hi level alarm inoperable:</p>			

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A review of outstanding work items (work orders and work requests) on secondary plant level control systems was conducted to identify those items important to plant reliability. The outstanding work items were prioritized accordingly.

Contributing Factor 2

Inadequate written and verbal communications between off-going and on-coming operators:

The above noted lessons learned package also identified inadequate written and verbal communications as contributing to the event. The lessons learned package emphasized the operator's responsibilities in the turnover process and provided an example of more appropriate wording for the BOP RO relief checklist.

VI. PREVIOUS SIMILAR EVENTS

CPSES Licensee Event Reports 90-008-00 and 90-014-00 document events in which inadequate reviews of work orders resulted in safety related components being considered operable prior to completion of post work testing. Corrective actions for these previous events included counselling of personnel and modifications to the program for tracking Technical Specification Action requirements. Since these previous events involved inadequate review of work orders rather than failure to review clearance documentation, and since the components involved in this event were not governed by Technical Specifications, the corrective actions for the previous events were not specifically applicable to the cause of this event. However, since all three events involved inadequate determination by operators of the status of components during or following maintenance on the components, the Operations Department has initiated a review of the events to assess the need for further action.

VII. ADDITIONAL INFORMATION

The times listed in the report are Central Daylight Savings Time (CDT).