



Log # TXX-95137
File # 10200
Ref. # Voluntary

May 30, 1995

C. Lance Terry
Group Vice President

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

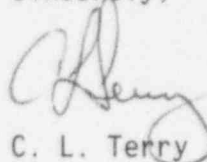
SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
REPORT OF EVENT WITH GENERIC INTEREST
LICENSEE EVENT REPORT 446/94-006-01

Gentlemen:

Enclosed is Supplement 1 to Licensee Event Report (LER) 94-006-01 for Comanche Peak Steam Electric Station, "Undervoltage Relays Were Found to be Out of Calibration Which Resulted in a Failure to Fully Satisfy Technical Specification Requirements."

Supplement 1 to the subject LER is being issued to provide information regarding CPSES Unit 1 Undervoltage relays, and additional corrective actions taken.

Sincerely,



C. L. Terry

OB:cc
Enclosure

cc: Mr. L. J. Callan, Region IV
Mr. D. F. Kirsch, Region IV
Resident Inspectors, CPSES

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S PDR

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. 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC. 20503.																									
Facility Name (1) COMANCHE PEAK-UNIT 2				Docket Number (2) 05000446																									
Title (A) UNDER VOLTAGE RELAYS WERE FOUND TO BE OUT OF CALIBRATION WHICH RESULTED IN A FAILURE TO FULLY SATISFY TECHNICAL SPECIFICATION REQUIREMENTS				Page (3) 1 OF 6																									
Event Date (5)		LER Number (6)		Report Date (7)																									
Month	Day	Year	Sequential Number	Revision Number	Month																								
05	26	94	006	011	05/30/95																								
Other Facilities Involved (8)		Facility Names																											
COMANCHE PEAK-UNIT 1		Docket Numbers																											
N/A		05000445																											
Operating Mode (B) 5		This report is submitted pursuant to the requirements of 10 CFR 43.44 (Check one or more of the following) (11)																											
Power Level (10) 01010		<table border="0" style="width:100%;"> <tr> <td><input type="checkbox"/> 20.402(b)</td> <td><input type="checkbox"/> 20.405(c)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)</td> <td><input type="checkbox"/> 73.71(b)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)</td> <td><input type="checkbox"/> 73.71(c)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(ii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> Other (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)(A)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iv)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> 20.405-a(1)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> <td></td> </tr> </table>				<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input 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 checked="" type="checkbox"/> 50.73(a)(2)(vi)	<input checked="" type="checkbox"/> 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)(vii)(A)		<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)		<input type="checkbox"/> 20.405-a(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	
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Name R. FLORES, SYSTEMS ENGINEERING MANAGER				Area Code Telephone Number 817-1897-155910																									
Complete One Line For Each Component Failure Described in This Report (13)																													
Cause	System	Component	Manufacturer	Reportable To NPRDS																									
				N																									
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																								
Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																													
<p>On May 26, 1994, Comanche Peak Steam Electric Station (CPSES) Unit 2 was in Mode 5, during its midcycle outage. During the performance of Unit 2 Train B undervoltage relay calibration and response time surveillance testing, the as found calibration data appeared to be outside the Technical Specification allowables. On March 14, 1995, Unit 1 was defueled and in its fourth refueling outage. While performing the Unit 1 Train A and Train B undervoltage relay calibration and response time surveillance testing, the same condition of the as found calibration data outside the Technical Specification allowables was observed, for the undervoltage relays (Train A anomaly was discovered on March 14, and Train B on March 22, 1995). The cause of these events was determined to be the methodology/instrumentation used to calibrate the Asea Brown Boveri relays, type ITE-27H and ITE-27N. Corrective actions were to adjust the relays, and provide additional guidance with respect to calibration. This voluntary report is being submitted due to recognition of the significance and generic interest of the event.</p>																													

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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.

Facility Name (1)

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COMANCHE PEAK-UNIT 2

05000446

Year

Sequential Number

Revision Number

94

- 006

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2

OF

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

I. DESCRIPTION OF THE REPORTABLE EVENT

A. EVENT CLASSIFICATION

This Licensee Event Report is submitted as a voluntary report.

B. PLANT OPERATING CONDITIONS BEFORE THE EVENT

On May 23 through 28, 1994, Comanche Peak Steam Electric Station (CPSES) Unit 2 was in Mode 5, Cold Shutdown. On March 14, 1995, through March 22, 1995, Unit 1 was defueled.

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 to the event.

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

On May 23, 1994, CPSES Unit 2 was in Mode 5, during its midcycle outage. Electrical Maintenance Technicians (utility, non-licensed) were conducting Train A undervoltage relay calibration and response time surveillance testing. Upon reviewing the as found calibration data, the technicians noted that 14 out of 16 relays were outside of their respective allowable Technical Specification values. The relay dropouts were found to be 1 to 3 volts outside expected values. The relays were adjusted to correct values. Following this discovery and correction, a comprehensive root cause evaluation was performed. It was concluded that the testing device used to calibrate the undervoltage relays did not provide accurate as-found data due to harmonic distortion, which effected peak values of the AC waveform.

During the time period of May 26, 27 and 28, 1994, TU Electric management opted to reverifify both Unit 2 Train A and Train B relays. The purpose of their reverification was to ascertain proper setting of the relays, utilizing a clean (low harmonic) AC power supply.

On May 28, 1994, during the reverification process, it appeared that 5 of the Unit 2 Train A relays (type ITE-27N and ITE-27H) were outside the Technical Specification values using the most conservative data.

NRC FORM 366A LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		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.																			
Facility Name (1) COMANCHE PEAK-UNIT 2	Docket Number (2) 015101010416	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3" style="text-align: center;">LER Number (6)</th> <th colspan="2" style="text-align: center;">Page (3)</th> </tr> <tr> <th style="width: 15%;">Year</th> <th style="width: 15%;">Sequential Number</th> <th style="width: 15%;">Revision Number</th> <th style="width: 15%;"></th> <th style="width: 15%;"></th> </tr> <tr> <td style="text-align: center;">94</td> <td style="text-align: center;">-</td> <td style="text-align: center;">006</td> <td style="text-align: center;">-</td> <td style="text-align: center;">01</td> </tr> </table>	LER Number (6)			Page (3)		Year	Sequential Number	Revision Number			94	-	006	-	01	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">3</td> <td style="width: 15%; text-align: center;">OF</td> <td style="width: 15%; text-align: center;">6</td> </tr> </table>	3	OF	6
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Year	Sequential Number	Revision Number																			
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3	OF	6																			
<p>Text (if more space is required, use additional NRC Form 366A's) (17)</p> <p>Following the discovery of Unit 2 Train A relays, which were not confirmed to be, but may have been outside of Technical Specification allowables, a voluntary Licensee Event Report (LER-446/94-006-00) was submitted due to recognition of the significance and generic interest of the event. Additionally, during the evaluation of this (Unit 2) finding, it was determined that the Unit 1 undervoltage relaying was not affected by the harmonic distortion problem. This determination was based on the conclusion that, the harmonic distortion increases with the quantity of equipment operating. However, Unit 1 calibrations were normally performed with both units in shut down, and harmonic distortion was not believed to impact the calibrations of the undervoltage relays. Additionally, the last calibration of Unit 1 relays had been performed with Unit 2 in operation, but using plant support power (which is a known source of "clean" power).</p> <p>On March 14, 1995, Unit 1 was defueled, during its fourth refueling outage. Electrical Maintenance Technicians (utility, non-licensed) were conducting Train A undervoltage relay calibration and response time surveillance testing. Upon reviewing the as found calibration data, the technicians noted 8 out of 16 relays were outside of their respective allowable Technical Specification values. The relay dropouts were found to be 1 to 2 volts outside the expected values. On March 22, 1995, Electrical Maintenance Technicians (utility, non-licensed) were performing the Train B undervoltage relay calibration and response time testing. Upon reviewing the as found calibration data, the technicians observed the same condition noted on the Train A testing, in that 8 of the 16 relays were outside of their respective allowable Technical Specification values. Although not outside the Technical Specification values, 3 additional relays were found to be outside their set point band. These relays dropouts were found to be 1 to 2 volts outside the expected values. The relays were adjusted to their correct values. Review of the root cause evaluation of the previous event on Unit 2 revealed no additional causes or new findings which would change the conclusions reached above.</p> <p>A voluntary report for both events is being submitted due to recognition of the significance and generic interest of the event.</p> <p>E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE OR PROCEDURAL ERROR</p> <p>The Electrical Maintenance Technicians discovered the conditions during the performance of routine surveillance testing.</p>																					

<small>NRC FORM 366A</small>		<small>U.S. NUCLEAR REGULATORY COMMISSION</small>		<small>APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92</small>																
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II. COMPONENT OR SYSTEM FAILURES

A. FAILED COMPONENT INFORMATION

Not applicable - there were no component failures associated with this event.

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

Not applicable - there were no component failures associated with this event.

C. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable - there were no component failures associated with this event.

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

Not applicable - there were no component failures associated with this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEMS RESPONSES THAT OCCURRED

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

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

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

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The safety function of the relays is to ensure that a nominal voltage is maintained at the motor loads, that motor terminal voltage is available during starting, and that motors do not stall during operation. Although the out-of-calibration conditions of the relays was found in Mode 5, the problem potentially existed in Modes 1 through Mode 4. A review of

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system grid voltage indicates that the lowest grid voltage recorded was not sufficiently low to cause actuation of the relays.

Additionally, the worst case theoretical as-found relay setting was still greater than the minimum required voltage for running or starting the motors, as required by design calculations.

It was concluded that the event did not adversely impact the safe operation of CPSES Unit 1 and Unit 2 or the health and safety of public. This is based on the review and evaluation of the dropout voltage and historical bus voltage information after the discovery.

IV. CAUSE OF THE EVENT

TU Electric's evaluation of the plant power source and the techniques used to perform the calibration of the undervoltage relays indicated that distortion of waveform coupled with tight tolerances requirements adversely affected the calibration of this type of relay.

Additionally, review of the vendor information related to these relays did not indicate the need for a special testing considerations while performing the calibration of these items. Therefore, the calibration procedures for these relays did not reflect specific testing equipment configurations required to minimize the effects of harmonic distortion on the calibration of these relays.

V. CORRECTIVE ACTIONS

The suspect undervoltage relays were verified using a clean AC power supply. The relays which were found to out of specification were recalibrated.

A procedure change was implemented to require the use of clean test source to perform the surveillance test for this type of relay in the future.

TU Electric has revised the setpoints for the Technical Specification related undervoltage relays to allow for a greater tolerance/calibration band.

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VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar events attributable to the cause of this event reported pursuant to 10CFR50.73.

VII. ADDITIONAL INFORMATION

Component Information:

Vendor: Asea Brown Boveri (ABB)
Relay Type: ITE-27H and ITE-27N