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Ref: 10CFR50.73(a)(2)(iv)(A)

CPSES-200402777  
Log# TXX-04192

December 20, 2004

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

**SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)  
DOCKET NO. 50-446  
ACTUATION OF SPECIFIED SYSTEMS:  
EMERGENCY DIESEL GENERATOR AND TURBINE DRIVEN  
AUXILIARY FEEDWATER PUMP  
LICENSEE EVENT REPORT 446/04-002-00**

Gentlemen:

Enclosed is Licensee Event Report (LER) 04-002-00 for Comanche Peak Steam Electric Station Unit 2, "Auto Start of the CPSES Unit 2 Train B Emergency Diesel Generator and the Turbine Driven Auxiliary Feedwater Pump."

This communication contains no new licensing basis commitments regarding CPSES Units 1 and 2.

*JE22*

A member of the STARS (Strategic Teaming and Resource Sharing) Alliance

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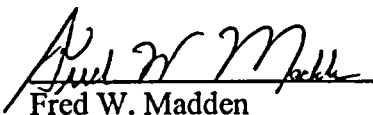
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Sincerely,

TXU Generation Company LP

By: TXU Generation Management Company LLC  
Its General Partner

Mike Blevins

By:   
Fred W. Madden  
Director, Regulatory Affairs

TJE/te

Enclosures

c - B. S. Mallett, Region IV  
W. D. Johnson, Region IV  
M. C. Thadani, NRR  
Resident Inspectors, CPSES

NRC FORM 366 (6-2004)		U.S. NUCLEAR REGULATORY COMMISSION				APPROVED BY OMB NO. 3150-0104			EXPIRES 06/30/2007				
LICENSEE EVENT REPORT (LER)											Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE0B-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.		
Facility Name (1) <b>COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2</b>						Docket Number (2) <b>05000446</b>			Page (3) <b>1 OF 6</b>				
Title (4) <b>ACTUATION OF SPECIFIED SYSTEM: EMERGENCY DIESEL GENERATOR AND TURBINE DRIVEN AUXILIARY FEEDWATER PUMP</b>													
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 Name	Docket Numbers			
10	19	04	04	002	00	12	20	04	N/A	05000			
Operating Mode (9)		This report is submitted pursuant to the requirements of 10 CFR : (Check all that apply) (11)											
1		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(i)(C)		50.73(a)(2)(vii)					
Power Level (10)		20.2201(d)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(A)					
100		20.2203(a)(1)		20.2203(a)(4)		50.73(a)(2)(ii)(B)		50.73(a)(2)(viii)(B)					
		20.2203(a)(2)(i)		50.36(c)(2)(i)(A)		50.73(a)(2)(iii)		50.73(a)(2)(ix)(A)					
		20.2203(a)(2)(ii)		50.36(c)(1)(ii)(A)		X 50.73(a)(2)(iv)(A)		50.72(a)(2)(x)					
		20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(v)(A)		73.71(a)(4)					
		20.2203(a)(2)(iv)		50.46(a)(3)(ii)		50.73(a)(2)(v)(B)		73.71(a)(5)					
		20.2203(a)(2)(v)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(C)		OTHER Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(B)		50.73(a)(2)(v)(D)							
Licensee Contact For This LER (12)													
Name <b>Timothy A. Hope - Regulatory Performance Manager</b>								Telephone Number (Include Area Code) <b>254-897-6370</b>					
Complete One Line For Each Component Failure Described in This Report (13)													
Cause	System	Component	Manufacturer	Reportable To EPIX		Cause	System	Component	Manufacturer	Reportable To EPIX			
				N									
Supplemental Report Expected (14)								EXPECTED SUBMISSION DATE (15)		Month	Day	Year	
YES (If YES, complete EXPECTED SUBMISSION DATE)				X		NO							
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)													
<p>On October 19, 2004, one of the two feeder lines to the CPSES 138 kV switchyard was out of service due to modifications on the CPSES switchyard circuit breaker relays and the associated feeder circuit breaker relays at a different switchyard. At approximately 0520 on the same day, the second feeder line to the CPSES 138 kV switchyard was unexpectedly lost causing the loss of all 138 kV power to the CPSES 138 kV switchyard. As expected, both Unit 2 6.9 kV safeguards electrical trains, Trains A and B lost power, a slow transfer to the alternate 6.9 kV Class 1E bus through the 345 kV switchyard source was initiated, both blackout sequencers started, and the Turbine Driven Auxiliary Feedwater Pump started as required. Due to the cold water effects as a result of the start of Auxiliary Feedwater, the turbine load was manually reduced by 20 MW to 1170 MWe. Additionally, the Unit 2 Train B Emergency Diesel Generator (EDG) started unexpectedly, but was not required to load because power was available from the CPSES 345 kV switchyard through the alternate 345/6.9 kV transformer. Investigation revealed that the unexpected start of the EDG was due to the erratic behavior of the Preferred Offsite Source Bus Undervoltage Agastat relay. Once the relay was replaced, the preferred 138/6.9 kV Class 1E source was returned to service at 2335 feeding both safeguards buses. All times in this report are approximate and Central Standard Time unless noted otherwise.</p>													

**LICENSEE EVENT REPORT (LER)**

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

**I. DESCRIPTION OF REPORTABLE EVENT****A. REPORTABLE EVENT CLASSIFICATION**

An event or condition that resulted in valid actuation of any system listed in 10CFR50.73 (a)(2)(iv)(B). Specifically, an EDG automatically started and the Turbine Driven Auxiliary Feedwater Pump started.

**B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT**

On October 19, 2004, prior to the event, Comanche Peak Steam Electric Station (CPSES) Unit 2 was in Mode 1 and at 100% Power Operations.

**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 other than the DeCordova feeder line to the CPSES 138 kV switchyard was out of service due to maintenance at the start of the event.

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

On October 19, 2004 and before 0520, the DeCordova feeder line to the CPSES 138 kV switchyard was out of service due to maintenance on the CPSES switchyard circuit breaker [EHS: (FD)(52)] and the associated DeCordova switchyard circuit breaker relays. The Stephenville feeder line was in service. The two feeder lines to the CPSES 138 kV switchyard are from DeCordova and Stephenville switchyards. All five feeder lines to the CPSES 345 kV switchyard were in service.

At approximately 0520 on the same day, a circuit breaker in the Stephenville 138 kV switchyard tripped and failed to reclose causing the loss of power to the CPSES 138 kV switchyard. Loss of power to the 138 kV switchyard caused the loss of offsite power to the Unit 2 138/6.9 kV Startup Transformer XST1.

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As expected, both Unit 2 6.9 kV safeguards electrical trains, Trains A and B, momentarily lost power due to the loss of the 138 kV switchyard to the Unit 2 Startup Transformer. A loss of normal power supply to the 6.9 kV AC safeguards buses results in a transfer to the alternate power supply, which also includes load shed of the bus and initiation of the blackout sequencer in order to reload the bus. Additionally, initiation of the blackout sequencer results in an automatic start of the Turbine Driven Auxiliary Feedwater Pump [EIIS: (BA)(P)]. If the transfer to the 6.9 kV Train A and B bus alternate power supply is successful, the respective EDGs will not start. In this event, a slow transfer to the alternate 6.9 kV Class 1E source was initiated and both blackout sequencers started, and the Turbine Driven Auxiliary Feedwater Pump started as required.

In response to the start of Turbine Driven Auxiliary Feedwater Pump and delivery of the relatively cold feedwater, the reactor operators (utility, Licensed) lowered power by 20 MW from 1190 MWe to 1170 MWe. Additionally, the Unit 2 Train B EDG [EIIS: (BK)(DG)] started unexpectedly, but was not required to load because the safeguards buses were re-energized following the slow transfer from the CPSES 345 kV switchyard. The bus undervoltage relays should have caused both Train A 2EA1-1 and Train B 2EA2-1 circuit breakers to open in less than or equal to one-half second. 2EA1-1 operated correctly, but 2EA2-1 did not open for approximately 30 seconds due to the failed Agastat relay. The DG output circuit breaker was prevented from closing due to the 2EA2-1 breaker still being shut, thereby preventing the alternate source breaker 2EA2-2 from closing first. The Unit 2 Train A equipment performed as required.

The Turbine Driven Auxiliary Feedwater Pump was promptly secured per site operating procedures.

The Stephenville line was returned to service at approximately 0606 on the same day, restoring power to the CPSES switchyard and XST1. Investigation revealed that the unexpected start of the EDG was due to the erratic behavior of the Preferred Offsite Source Bus Undervoltage Agastat relay. Once the relay was replaced, the preferred 138/6.9 kV Class 1E source was returned to service at 2335 feeding both safeguards buses.

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

Control board indicators and alarms alerted the Reactor Operator (Utility, Licensed) of a loss of power to transformer XST1, the Unit 2 Train B EDG auto start, and the Turbine Driven Auxiliary Feedwater Pump start.

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### II. COMPONENT OR SYSTEM FAILURES

#### A. FAILURE MODE, MECHANISM, AND EFFECTS OF EACH FAILED COMPONENT

The automatic start of the Unit 2 Train B EDG, in response to the bus transfer, was unexpected. Troubleshooting determined that the time delay relay 27BX-1/ST1 was operating erratically.

#### B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Performance of multiple tests on the time delay relay 27BX-1/ST1 determined that the time delay relay degraded to a point where repeatability was lost.

#### 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.

#### D. FAILED COMPONENT INFORMATION

Manufacturer: Tyco Electronics  
 Model No. E7012PA002  
 Agastat relay

### III. ANALYSIS OF THE EVENT

#### A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Both Unit 2 Trains A and B blackout sequencers started, the Turbine Driven Auxiliary Feedwater Pump started, and a slow transfer to the alternate 345/6.9 kV Class 1E power supply XST2 was initiated. The Unit 2 Train B EDG started, but did not load. The bus undervoltage relays should have caused both Train A 2EA1-1 and Train B 2EA2-1 circuit breakers to open in less than or equal to one-half second. 2EA1-1 operated correctly, but 2EA2-1 did not open for approximately 30 seconds due to the failed Agastat relay. The Unit 2 Train A equipment performed as required.

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**B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY**

Not applicable -- However, the offsite 138 kV switchyard was inoperable from 0520 to 0606.

**C. SAFETY CONSEQUENCES AND IMPLICATIONS**

Both Unit 2 Trains A and B blackout sequencers started which function to reload the associated 6.9 kV safeguards bus in a pre-established sequence following the undervoltage condition on the bus and re-energization from the alternate power source. When the time delay relay 27BX-1/ST1 was slow to time out at approximately 30 seconds instead of less than or equal to one-half second, as designed, the preferred 6.9 kV Train B feeder breaker did not open as expected and the Unit 2 Train B EDG started, but was not required to load because alternate 6.9 kV power was supplied from the CPSES 345 kV switchyard via the Startup Transformer XST2. As a result of the slow transfer to the alternate 6.9 kV source, the Unit 2 Train B safety bus lost power for approximately 30 seconds. The unanticipated start of the EDG is attributed to the delay in the tripping of the Train B 6.9 kV switchgear preferred feeder breaker during slow transfer of the Safeguards buses to their alternate source.

Because the Train A safeguards bus was unaffected by this event, this condition did not result in a safety system functional failure, under 10 CFR 50.73 (a)(2)(v). Furthermore, there was no disruption in the non-safeguards loads required for normal plant operations because normal plant operations are unaffected by the loss of the 138 kV switchyard. Therefore, this event did not adversely affect the safe operation of CPSES Unit 2 or the health and safety of the public.

The Turbine Driven Auxiliary Feedwater Pump start is bounded within the existing accident analysis.

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**IV. CAUSE OF THE EVENT**

The bus undervoltage relays should have caused both Train A 2EA1-1 and Train B 2EA2-1 circuit breakers to open in less than or equal to one-half second. 2EA1-1 operated correctly, but 2EA2-1 did not open for approximately 30 seconds. The Unit 2 Train B EDG started due to the bus undervoltage, but was not allowed to close its output breaker due to 2EA2-1 breaker remaining closed. TXU Power believes that the 27BX-1/ST1 undervoltage relay for 2EA2-1 was operating erratically causing the start of the Train B EDG.

The Turbine Driven Auxiliary Feedwater Pump started as designed.

**V. CORRECTIVE ACTIONS**

The relay 27BX-1/ST was replaced with a new relay. The new relay was tested and within design specifications and subsequently placed in service. The defective relay was sent off site for a more detailed failure analysis to provide further understanding of the failure mechanism and potential extent of conditions for other similar Agastat relays on site.

**VI. PREVIOUS SIMILAR EVENTS**

There was a previous event involving an Agastat relay on October 7, 2002. Specifically, LER 02-003-00 is related to the erratic behavior of an Agastat relay causing the unexpected auto start of the Unit 1 Train B EDG. Corrective actions from the previous 2002 event included development of a schedule to replace all of the 212 safety related relays and approximately 55% of the relays have been replaced. The schedule was based on availability and on risk of failure of these relays based on past calibration data and failure history.

This specific relay was scheduled to be tested and replaced, if required, on October 25, 2004 as a result of the previous event. This relay has been sent offsite for detailed failure analysis. The current completion date to replace the remaining safety related relays is December 31, 2005.