



Rafael Flores
Senior Vice President
& Chief Nuclear Officer
rafael.flores@luminant.com

Luminant Power
P O Box 1002
6322 North FM 56
Glen Rose, TX 76043

T 254 897 5590
C 817 559 0403
F 254 897 6652

CP-201300170
TXX-13028

Ref. # 10CFR50.73

March 7, 2013

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT (CPNPP)
DOCKET NO. 50-446
UNIT 2 HOT SHUTDOWN PANEL TRANSFER SWITCH INOPERABLE
DUE TO WIRING ERROR
LICENSEE EVENT REPORT 446/13-001-00

Dear Sir or Madam:

Pursuant to 10CFR50.73(a)(2)(i)(B), Luminant Generation Company LLC (Luminant Power) hereby submits enclosed Licensee Event Report (LER) 446/13-001-00, "Unit 2 Hot Shutdown Panel Transfer Switch Inoperable due to Wiring Error" for Comanche Peak Nuclear Power Plant (CPNPP) Unit 2.

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

Should you have any questions, please contact Tim Hope at (254) 897-6370.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By: 
Fred W. Madden
Director, Oversight & Regulatory Affairs

A member of the STARS Alliance

Callaway · Comanche Peak · Diablo Canyon · Palo Verde · San Onofre · South Texas Project · Wolf Creek

IER
NRC

Enclosure

c - E. E. Collins, Region IV
B. K. Singal, NRR
Resident Inspectors, Comanche Peak

NRC FORM 366
(10-2010)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104

EXPIRES:10/31/2013

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 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 F53), 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, NEOB-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.

1. FACILITY NAME

Comanche Peak Nuclear Power Plant (CPNPP) Unit 2

2. DOCKET NUMBER

05000446

3. PAGE

1 OF 5

4. TITLE

UNIT 2 HOT SHUTDOWN PANEL TRANSFER SWITCH INOPERABLE DUE TO WIRING ERROR

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER
01	06	2013	13	001	00	03	07	2013	FACILITY NAME	DOCUMENT NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
10. POWER LEVEL 100	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> VOLUNTARY LER						

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Timothy A. Hope, Manager, Nuclear Licensing

TELEPHONE NUMBER (Include Area Code)

254-897-6370

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED
☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)
 ☒ NO
15. EXPECTED SUBMISSION DATE

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On January 6, 2013, Comanche Peak Nuclear Power Plant (CPNPP) Unit 2 was in Mode 1 operating at 100% power. At 0345 hours while performing surveillance testing on the Hot Shutdown Panel (HSP), the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) steam supply valve control transfer switch was placed in the HSP position. During the test, the steam supply valve for the TDAFWP pump opened when it should have remained closed. Therefore, the TDAFWP steam supply control transfer switch was declared inoperable. This condition existed for greater than the allowable Technical Specification (TS) required action completion of time of 30 days for TS 3.3.4, Remote Shutdown System.

The cause of this event was the new circuit wiring at the Unit 2 HSP was landed on incorrect terminals. This error was not found during the verification of termination of the new circuit wiring. The post work testing requirements were ineffective in the discovery of the error.

Immediate corrective actions included correct termination of the cables and completion of the surveillance testing of the HSP. As a part of the CPNPP Corrective Action Program, procedures will be revised to ensure that the conduct of field work and inspection of cable terminations is correct and post work testing training will ensure that all aspects of the modified circuit are tested.

All times in this report are approximate and Central Time unless noted otherwise.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME Comanche Peak Nuclear Power Plant Unit 2	2. DOCKET 05000 - 446	6. LER NUMBER			3. PAGE 2 OF 5
		YEAR	SEQUENTIAL NUMBER	REV NO.	
		2013	001	00	

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

I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION:

10CFR50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications."

B. PLANT CONDITION PRIOR TO EVENT:

On January 6, 2013, CPNPP Unit 2 was in Mode 1 operating at 100% power.

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 structures, systems, or components that 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 January 6, 2013, Comanche Peak Nuclear Power Plant (CPNPP) Unit 2 was in Mode 1 operating at 100% power. At 0345 hours while performing surveillance testing on the Hot Shutdown Panel (HSP), the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) steam supply valve control transfer switch [EIS: (BA)(P)(V)(HIS)] was placed in the HSP position. During the test, the steam supply valve for the TDAFWP pump opened when it should have remained closed. Therefore, the TDAFWP steam supply control transfer switch was declared inoperable.

The circuit for one of the TDAFWP steam supply valves was being modified to assure that, in the scenarios that credit the TDAFWP, the valve would not be unintentionally kept closed by an external hot short. When the valve is needed to open, power needs to be removed from the circuit. The new cable installation was partially completed prior to the start of the Unit 2 refueling outage (2RF13) when two cables were pulled to a cable tray above the HSP on September 19, 2012. The two cables were properly labeled and waiting for termination during 2RF13.

During 2RF13, preparations were made to the two new cables for termination in the HSP cabinet. During this preparation the two cables were unlabeled at the same time while being moved inside the HSP cabinet. Once the new cables were inside the cabinet the new conductors were mislabeled and terminated on October 8, 2012. Quality control inspections did not determine that the new conductors were terminated incorrectly, since the mislabeled conductors were on the correct termination for the label of the cable.

The testing requirements of the modification were to functional stroke the TDAFWP steam supply valve and perform cable continuity checks. The scope of the modification was to replace existing cable with new cable that was designed to prevent a hot short from occurring. The post work test specified for this modification was to stroke the TDAFWP steam admission valve. The valve was only stroked from the control room control station. This test was performed during 2RF13 prior to entering Mode 3 on October 31, 2012. This method of testing did not test all portions of the control circuit where cable and wiring was replaced. Consequently an error in wiring in a portion of the circuit not used to stroke the valve was not detected by the post work test.

On January 9, 2013, it was determined that the two new conductors had been mislabeled and landed on their opposite terminals. The conductors were correctly relabeled and terminated in accordance with the modification. This corrected the condition and the surveillance testing on the HSP was completed with satisfactory results and the TDAFWP steam supply control transfer switch was declared operable.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME Comanche Peak Nuclear Power Plant Unit 2	2. DOCKET 05000 - 446	6. LER NUMBER			3. PAGE 3 OF 5
		YEAR	SEQUENTIAL NUMBER	REV NO.	
		2013	001	00	

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

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

The inoperable condition was discovered by Operations (Utility, Licensed) personnel during performance of surveillance testing on the Hot Shutdown Panel.

II. COMPONENT OR SYSTEM FAILURES

A. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable – No component or system failures were identified during this event.

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

Not applicable – No component or system failures were identified during this event.

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

Not applicable – No component or system failures were identified during this event.

D. FAILED COMPONENT INFORMATION

Not applicable – No component or system failures were identified during this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Not applicable – No safety system responses occurred as a result of this event.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

The Remote Shutdown System is required to be operable in Modes 1, 2, and 3. CPNPP Unit 2 entered Mode 3 on October 31, 2012, and the issue was corrected on January 9, 2013. Therefore the Unit 2 Remote Shutdown System was inoperable for 70 days.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The TDAFWP steam supply valves are normally closed, and fail open on loss of air or electrical power. The valves are required to open in the fire scenarios which credit the TDAFWP. The TDAFWP is the credited AFWP for fires in Fire Areas SB and SD where both the train A and B Motor Driven Auxiliary Feedwater Pumps (MDAFWPs) are potentially lost.

The circuit for one of the TDAFWP steam supply valves was modified to assure that, in the scenarios that credit the TDAFWP, the valve would not be unintentionally kept closed by an external hot short. When the valve is needed to open, power needs to be removed from the circuit.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME Comanche Peak Nuclear Power Plant Unit 2	2. DOCKET 05000 - 446	6. LER NUMBER			3. PAGE 4 OF 5
		YEAR	SEQUENTIAL NUMBER	REV NO.	
		2013	001	00	

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

The controls at the Hot Shutdown Panel include controls for both the TDAFWP and the MDAFWPs. For a fire in the control room or cable spreading room utilizing the alternate system, the train A MDAFWP is the credited auxiliary feedwater pump. Given the wiring problem on one of the TDAFWP steam supply valves, the consequence would be to open the valve upon control transfer to the Hot Shutdown Panel. This would start the TDAFWP. Due to potential circuit interactions in the Control Room/Cable Spread Room (CR/CSR), it is postulated that the TDAFWP will start in a fire scenario. The operations fire response procedures direct the operator to take a pre-emptive action to trip the TDAFWP prior to CR/CSR evacuation and also direct a follow up action to manually trip the TDAFWP locally later in the scenario. The wiring error had no effect on the fire safe shutdown analysis since the necessary actions to mitigate the open valve are taken already. It is noted that once the TDAFWP is tripped, it cannot spuriously restart without manual intervention to reset the trip/throttle valve.

Based on the above, there were no actual safety consequences and the health and safety of the public was not affected and this event has been evaluated to not meet the definition of a safety system functional failure per 10CFR50.73(a)(2)(V).

IV. CAUSE OF THE EVENT

The modification procedure for cable termination was less than adequate. The procedure does not address the removal and replacement of labels or verification of labels. If labels are removed and reinstalled there is no verification of their restoration or tracking of cable identity while a label is removed.

If there is no specific control of the labels or specific verification on the cable/conductor identity by a continuity check in conjunction with labeling, there is no other check or inspection that can detect an incorrect label. The incorrect label cannot be detected by only a visual examination in all cases.

The quality of the cable termination procedure and the low priority given to maintaining a quality procedure is apparent from the procedures age, the delay experienced in updating the procedure and the work group's incomplete implementation of the procedure. This increased the potential for human performance errors during the use of this procedure and when a wiring error occurred it allowed the error to go undetected by installation craft.

There was a lack of understanding of Control Circuit testing when wiring is disturbed. The person that established the post work test did not understand that the scope of testing should include a functional test of all devices of the control circuit in the path of the replaced conductors. The stated test focused on the function of the end device and not the function of the control circuit switches.

V. CORRECTIVE ACTIONS

Troubleshooting was completed and the surveillance testing on the HSP was completed with satisfactory results and the TDAFWP steam supply control transfer switch was declared operable.

Electrical safety related modifications installed under the modification procedure for cable termination since October 2009 were reviewed and verified to have adequate post modification tests to verify function of the disturbed circuits. Modifications to the hot shutdown panels completed in the previous Unit 1 and Unit 2 refueling outages were reviewed for adequacy of post work testing.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME Comanche Peak Nuclear Power Plant Unit 2	2. DOCKET 05000 - 446	6. LER NUMBER			3. PAGE 5 OF 5
		YEAR	SEQUENTIAL NUMBER	REV NO.	
		2013	001	00	

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

Modifications that will be implemented in the upcoming Unit 1 refueling outage have been reviewed and revised to ensure proper control of cable/conductor labeling and the adequacy of post modification testing for verifying the function of the disturbed circuits.

As a part of the CPNPP Corrective Action Program, procedures will be revised to ensure positive control of labels for cables. Procedures will require a continuity check to verify cable/conductor ends when labels are placed on an unlabeled cable if the labels are removed or become detached. Post work testing training will be conducted to ensure that all aspects of testing of disturbed circuits for electrical modifications are addressed.

VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar reportable events at CPNPP in the last three years.