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CP-201100901  
Log # TXX-11084

Ref. # 10CFR50.73(a)(2)(i)(B)  
10CFR50.73(a)(2)(v)

August 22, 2011

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT  
DOCKET NO. 50-446  
UNIT 2 EDG 2-02 INOPERABLE DUE TO FUEL OIL LEAK  
LICENSEE EVENT REPORT 446/11-003-00

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) 446/11-003-00, "Unit 2 EDG 2-02 Inoperable Due to Fuel Oil Leak." This event did not affect the health and safety of the public or plant personnel.

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

Should you have any questions, please contact Ms. Tamera J. Ervin-Walker at (254)897-6902.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

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

TJEW  
Enclosure

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

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

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

IE22  
NRR

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](mailto: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****05000 446****3. PAGE**

1 OF 6

**4. TITLE**

UNIT 2 EDG 2-02 INOPERABLE DUE TO FUEL OIL LEAK

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
06	21	2011	2011	003	00	08	22	2011	FACILITY NAME	DOCUMENT NUMBER <b>05000</b>

**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) |
| <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 checked="" 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 checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | <input type="checkbox"/> VOLUNTARY LER        |

**10. POWER LEVEL**

100

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME

Timothy A. Hope, Nuclear Licensing Manager

TELEPHONE NUMBER (Include Area Code)

254-897-6370

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	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 April 15, 2011, Unit 2 was in Mode 6 for the 2RF12 refueling outage. At 1130 hours, a 12 drop per minute (dpm) fuel oil leak was discovered on the Train B Emergency Diesel Generator (EDG 2-02). The leak was not corrected during 2RF12 because the leak was believed to be through the pipe threads, it did not constitute a structural failure, and the size of the leak did not affect the operability of EDG 2-02. On May 10, 2011, a 24-hour run of EDG 2-02 was commenced at 2304 hours per Technical Specification (TS) requirements. At the start of the run, the fuel leak was 12 dpm. Over the course of the run, the leak worsened, until at the 13-hour point it exceeded one liter per minute (lpm). EDG 2-02 was secured and declared inoperable at 1326 on May 11, 2011. Repairs were completed at 0425 hours on May 12, 2011 and EDG 2-02 was declared operable. The cause of the event was fatigue failure caused by long-term vibration stresses. Corrective actions included inspecting EDGs 1-01, 1-02, and 2-01, and no other leaks were identified. 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 6
		YEAR 2011	SEQUENTIAL NUMBER -- 003--	REV NO. 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:**

This event is reportable per 10CFR50.73(a)(2)(i)(B) as a condition that was prohibited by the plant's TS and 10CFR50.73(a)(2)(v) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (B) Remove residual heat; or (D) Mitigate the consequences of an accident.

**B. PLANT CONDITION PRIOR TO EVENT:**

On May 11, 2011 at 1326, Comanche Peak Nuclear Power Plant (CPNPP) Unit 2 was in Mode 1 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**

During the period from April 15, 2011 to May 12, 2011, there were two occasions where both Unit 2 EDG trains were inoperable. This condition occurred from April 15, 2011 at 1130 to April 19, 2011 at 1733, and again on April 27, 2011 from 0923 to 1302.

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

On April 15, 2011, at 1130 hours, Unit 2 was in Mode 6, approximately two weeks into the twelfth refueling outage (2RF12), when a 12 drop-per-minute (dpm) fuel oil leak was discovered on a Schedule 80 carbon steel fuel oil crossover header of the Train B Emergency Diesel Generator (EDG 2-02) [EIS: (EK) (DG)]. No attempt was made to fix the leak at the time of discovery due to EDG 2-02 being under a Defense in Depth (DID) for work on the Unit 2 Train A EDG (EDG 2-01).

The EDG System Engineer (Utility, Non-licensed) evaluated the Schedule 80 carbon steel pipe leak and provided an operability determination. After a close visual inspection, the System Engineer determined the leak to be through the threads of the pipe fitting and that it did not constitute a structural failure. Furthermore, the 12 dpm leak did not impede the EDG 2-02 from accomplishing its designed function.

The EDG System Engineer provided the results of his evaluation as his input to an operability report. That report resulted in the Operations Department determining EDG 2-02 remained operable.

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

A Work Order (WO) was initiated on April 15, 2011 to repair the fuel oil leak. Work could not immediately start due to EDG 2-01 being out-of-service at the time. Repairs to EDG 2-02 would have rendered it inoperable for the duration of the repair.

This condition would have been prohibited by Technical Specifications (TS) 3.8.2, "AC Sources – Shutdown" since the LCO for Modes 5 and 6 requires one EDG to be operable.

Since it was concluded that the EDG 2-02 fuel leak did not affect its operability, addressing it was not an immediate high priority for the Outage Manager (Utility, Non-licensed). The repair of the fuel leak was placed on the Outage Control Center's (OCC's) emergent tracking board until a suitable outage work window became available. The WO was subsequently assigned a 2RF13 work code. That assignment effectively removed it from any future consideration by the at-power Work Schedulers.

At 2304 hours on May 10, 2011, a 24-hour run of EDG 2-02 was commenced to satisfy an 18-month TS Surveillance Requirement (SR). At the start of the run, the fuel leak was the previously recorded 12 dpm. Over the course of the run, the leak worsened, until at the 13-hour point it exceeded 1 liter per minute. EDG 2-02 was secured and deemed inoperable at 1326 on May 11, 2011. Repairs were completed at 0425 hours on May 12, 2011 and EDG 2-02 was declared operable.

Offsite power was never inoperable during this event.

Until the EDG 2-02 was declared inoperable during the 24-hour run of EDG at 2304 on May 10, 2011, the minor thread leak was not considered a challenge to the structural integrity of the pipe and the size of the leak, 12 dpm, did not impede the EDG 2-02 from accomplishing its designed function.

On June 21, 2011, based on subsequent conclusion that EDG 2-02 was inoperable since the leak was identified, this condition was determined to be reportable per 10CFR50.73(a)(2)(i)(B) as a condition that was prohibited by the plant's TS for exceeding the Completion Times. This event is also reportable under 10CFR50.73(a)(2)(v) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (B) Remove residual heat; or (D) Mitigate the consequences of an accident" for the period of time when both trains of EDGs were inoperable.

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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**

On April 15, 2011, at 1130, Unit 2 was in Mode 6, approximately two weeks into the twelfth refueling outage (2RF12), when a 12 drop-per-minute (dpm) fuel oil leak was discovered on a fuel oil crossover header of the EDG 2-02. No attempt was made to fix the leak at the time of discovery due to EDG 2-02 being under a DID for work on EDG 2-01.

At 2304 May 10, 2011, a 24-hour run of EDG 2-02 was commenced to satisfy an 18-month TS SR. At the start of the run, the fuel leak was the previously recorded 12 dpm. Over the course of the run, the leak worsened, until at the 13-hour point it exceeded 1 liter per minute. EDG 2-02 was secured and deemed inoperable at 1326 on May 11, 2011. Repairs were completed at 0425 hours on May 12, 2011 and EDG 2-02 was declared operable. Upon disassembly for repair, the Schedule 80 carbon steel fuel oil piping failed due to vibration induced stresses causing circumferential cracking at the leaking threaded connection.

**II. COMPONENT OR SYSTEM FAILURES****A. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE**

The cause of the EDG 2-02 fuel oil system failure was the failure of a fuel oil pipe due to fatigue failure because of long term vibrational stress.

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

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

**D. FAILED COMPONENT INFORMATION**

Not applicable – No component 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.

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

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

On April 15, 2011 at 1130 hours, Unit 2 was in Mode 6 and EDG 2-01 was inoperable. On April 15, 2011 at 1130 hours, Unit 2 was in Mode 6 when the fuel leak was discovered on EDG 2-02. If an event occurred and EDG 2-02 was required to start and run, the leak would have worsened as it did on May 11, 2011. Consequently, EDG 2-02 would not have the required amount of fuel to run seven days and therefore, would have been inoperable per TS. On April 19, 2011 at 1733 hours, EDG 2-01 was restored operable. As a result, from April 15 at 1130 to April 19 at 1733 hours, Unit 2 would have entered TS 3.8.2, "AC Sources – Shutdown," Condition B since one EDG is required to be operable and both EDGs were inoperable.

Unit 2 reached Mode 4 on April 24, 2011 at 0518 hours. However, with Unit 2 in MODE 4 and EDG 2-02 still inoperable Unit 2 would have entered TS 3.8.1, "AC Sources Operating" since two EDGs are required and EDG 2-02 is inoperable.

On April 27, 2011 from 0923 to 1302 hours, the 2-01 EDG was declared inoperable for a TS SR test while Unit 2 was in MODE 1. Since both EDGs were now inoperable during 0923 to 1302 hours, Unit 2 would have entered TS 3.8.1, Condition E for two EDGs inoperable.

Since EDG 2-01 was declared operable at April 27, 2011 at 1302 and EDG 2-02 was still inoperable, TS Condition E would have been exited and Condition B would have been entered since one EDG is inoperable in Mode 1.

EDG 2-02 was restored on May 12, 2011 at 0425 hours and Condition B would have been exited since both Unit 2 EDGs were operable.

**C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT**

The safety function of the CPNPP EDGs is to automatically start and provide power in emergency mode whenever an under-voltage condition is experienced on their respective emergency bus or an SI signal is received. As noted in the event description, the Unit 2 Train B EDG was subsequently considered inoperable from April 15, 2011 to May 12, 2011. During the period of time from April 15, 2011 to May 12, 2011, both of the required offsite power sources were operable and available and no events occurred requiring the EDGs to start and perform their safety function of providing power to the safety related buses. Based on the above, there were no actual safety consequences and the health and safety of the public was not affected.

During the period from April 15, 2011 to May 12, 2011, there were two occasions where both Unit 2 EDG trains were inoperable. This condition occurred from April 15, 2011 at 1130 to April 19, 2011 at 1733, and again on April 27, 2011 from 0923 to 1302. For the period of time that both Unit 2 EDGs were inoperable, the condition meets the definition of a safety system functional failure per 10CFR50.73(a)(2)(v).

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

However, during this period of time, the non-safety Alternate Power Diesel Generators were available and had the capacity and capability of supplying the necessary equipment for safe shutdown and long term cooling for Unit 2.

**IV. CAUSE OF THE EVENT**

The cause of the EDG 2-02 fuel oil piping failure was fatigue failure caused by long-term vibration stresses. In addition, it was not recognized that the leak was of a condition where subsequent degradation could occur and could impact the EDG's mission time. Therefore, the repair was not scheduled in an expeditious manner consistent with the EDG's safety significance.

**V. CORRECTIVE ACTIONS**

The EDG 2-02 crossover piping was repaired and the EDG 2-02 was declared operable. The other EDGs (EDG 1-01, 1-02, and 2-01) crossover piping and piping connections were inspected and no leaks were identified. Additionally, no other leaks of the Schedule 80 carbon steel crossover header piping were identified during inspections for the OPT-214 runs for the other EDGs. Further evaluation of flow induced vibration for the EDG fuel systems, including base excitation is being performed and tracked in the corrective action program. As part of the corrective action program, the process for conducting operability evaluations of similar degraded conditions is being reviewed for additional improvements.

**VI. PREVIOUS SIMILAR EVENTS**

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