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CP-201101540  
TXX-11134

Ref. # 10CFR50.73

December 19, 2011

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT  
DOCKET NOS. 50-445 and 50-446  
LICENSEE EVENT REPORT 445/11-003-00, UNSUITABLE  
MATERIAL ON CONTAINMENT AIRLOCK

Dear Sir or Madam:

Enclosed is Licensee Event Report (LER) 445/11-003-00, "Unsuitable Material on Containment Airlock," for Comanche Peak Nuclear Power Plant (CPNPP) Units 1 and 2.

This letter contains no new regulatory commitments regarding CPNPP Units 1 and 2.

Should you have any questions concerning this submittal, please contact Mr. Tim Hope, Manager, Nuclear Licensing, at (254) 897-6370.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

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

Enclosure - LER 1-11-003-00 Unsuitable Material on Containment Airlock

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

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 [infocollect@nrc.gov](mailto:infocollect@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 1

## 2. DOCKET NUMBER

05000 445

## 3. PAGE

1 OF 6

## 4. TITLE

Unsuitable Material on Containment Airlock

## 5. EVENT DATE

MONTH	DAY	YEAR
10	18	11

## 6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO.
2011	003	00

## 7. REPORT DATE

MONTH	DAY	YEAR
12	19	11

## 8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCUMENT NUMBER
N/A	
FACILITY NAME CPNPP Unit 2	DOCUMENT NUMBER 05000 446

## 9. OPERATING MODE

5

## 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 checked="" 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 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)             | VOLUNTARY LER                                 |

## 10. POWER LEVEL

0

## 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 October 18, 2011 Unit 1 was in Mode 5 for the 1RF15 refueling outage and Unit 2 was in Mode 1 at 100% power. At 1545 hours, an installed valve on the containment side of the Unit 1 personnel airlock hydraulic system was determined to have an aluminum body. Aluminum is a restricted/limited material in containment because it is not compatible with accident conditions. The aluminum valve body could potentially lose pressure integrity during a LOCA with containment spray actuation. Subsequently, on October 19 at 2002, two pressure gauges on the Unit 1 personnel airlocks and two pressure gauges on Unit 2 personnel airlocks, located inside the Reactor Containment Buildings, were also found to have an external epoxy coated aluminum casing and pressure boundary parts which have not been completely verified to be resistant to containment spray. The pressure gauges in all 4 airlocks have been isolated by closed ASME Class 2 isolation valves. The cause of this event was an inadequate design change for the airlocks. Corrective actions include encasing the personnel airlock hydraulic system valve inside containment to prevent exposure of the valve body to the sodium hydroxide in the containment spray and removing and replacing the airlock pressure gauges inside containment with stainless steel plugs. All times in this report are approximate and Central Time unless noted otherwise.

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

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2011	003	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 50.72(b)(3)(ii)(B) as an unanalyzed condition that significantly degrades plant safety.

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

On October 18, 2011 at 1545 hours, Comanche Peak Nuclear Power Plant (CPNPP) Unit 1 was in Mode 5 and 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**

This condition occurred since original licensing and startup of Units 1 and 2.

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

On September 14, 2011, at approximately 1600, during performance of a self-assessment for 50.59 reviews, the assessor (Utility, Non-licensed) reviewed an open technical evaluation replacement item (TERI) on the personnel airlock. Since the evaluation was open, the assessor provided feedback to Procurement Engineering regarding a potential issue with the material of an installed valve on the containment side of the hydraulic system for the personnel airlock (1BS-0053). The Master Equipment List was checked and it indicated that the installed valve was of an appropriate material. Therefore, a Condition Report was not initiated at that point.

On October 3, 2011, at approximately 1421 subsequent to examination with an alloy analyzer of the actual installed valve, it was determined that the Unit 1 hydraulic valve for the containment side of the personnel airlock [EIS: (NH)(AL)(V)] has an aluminum body which is not appropriate for use in containment. The containment personnel airlock hydraulic system on Unit 2 is different than Unit 1, and since this valve is not part of the Unit 2 containment boundary, this was considered a Unit 1 issue only. This valve is currently installed in Unit 1, location 1BS-0053, CNTMT PERS AIRLOCK 1-01 INT DOOR SWING DUAL FCV. On October 18, at approximately 1545, while Unit 1 was in mode 5 prior to startup from the 1RF15 refueling outage, it was determined that the valve may not complete the 30 day mission time for containment isolation and the event was determined to be reportable per 50.72(b)(3)(ii)(B) as an unanalyzed condition that significantly degrades plant safety (NRC event 47352). At that time, Unit 1 was in Mode 5 and Operability of the Personnel airlock was not required. The airlock hydraulic system achieves containment integrity by being a closed system

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

inside containment. A loss of pressure boundary integrity of 1BS-0053 would open the hydraulic system to containment and would no longer meet General Design Criteria 57 (GDC-57) for a closed system.

As a compensatory measure, the personnel airlock hydraulic system valve (1BS-0053) inside containment was encased in stainless steel and filled with an approved sealant (to prevent exposure of the valve body to the sodium hydroxide in the containment spray) prior to entering Mode 4 during startup (when the personnel airlock is required to be operable). This protection of the valve body will assure that the mission time for containment isolation would be met.

On October 19, 2011, at approximately 1100, an extent of condition review of the components and appurtenances associated with the Personnel airlock and Emergency airlock for both Unit 1 and 2 was completed. Two pressure gauges on the Unit 1 Personnel and Emergency airlocks (1-PI-AL012 and 1-PI-AL027) and two pressure gauges on Unit 2 Personnel and Emergency airlocks (2-PI-AL012 and 2-PI-AL027), located inside the Reactor Containment Buildings, were found to have an external epoxy coated aluminum casing. The casing is not a pressure boundary part; however, failure of the casing would expose the internals to containment spray. The pressure sensing element and brazing material used to connect the sensing element to the gauge process connection is being evaluated. The pressure gauges in all 4 airlocks have been isolated by closed ASME Class 2 isolation valves. On October 19, at approximately 2002, it was determined that pressure instrumentation may not complete the mission time for containment isolation and the event was determined to be reportable per 50.72(b)(3)(ii)(B) as an unanalyzed condition that significantly degrades plant safety (NRC event 47357). Exposure of these pressure instruments to Design Basis Accident environment (Containment Spray containing sodium hydroxide) could compromise their integrity. This loss of integrity would violate the redundancy of the Containment pressure boundary integrity of the Reactor Buildings. The outer isolation barrier would still provide isolation from the safeguards building.

The pressure gauges in all 4 airlocks have been isolated by closed ASME Class 2 isolation valves to restore the redundancy of the Containment personnel airlock and Operability. Subsequently, the airlock pressure gauges inside containment were removed and replaced with a stainless steel plug to prevent a loss of the redundancy of the containment pressure boundary during and after a LOCA.

Based on subsequent conclusion that the containment airlock was inoperable due to the inner door materials, this condition is reportable per 10CFR50.73(a)(2)(i)(B) as a condition that was prohibited by the plant's TS for exceeding the Completion Times and 50.72(b)(3)(ii)(B) as an unanalyzed condition that significantly degrades plant safety.

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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**

During performance of a self-assessment for 50.59 reviews, the assessor (Utility, Non-licensed) reviewed an open TERI evaluation on the personnel airlock. Since the evaluation was open, the assessor provided feedback to Procurement Engineering. This feedback led to the review that identified an issue with the valve material of the existing installed valve. The valve has an aluminum body and is not appropriate for use in containment. This valve is currently installed in Unit 1, location 1BS-0053, CNTMT PERS AIRLOCK 1-01 INT DOOR SWING DUAL FCV. The extent of condition review for the issue found that two pressure gauges on the Unit 1 personnel airlocks (1-PI-AL012 and 1-PI-AL027) and two pressure gauges on Unit 2 personnel airlocks (2-PI-AL012 and 2-PI-AL027), located inside the Reactor Containment Buildings, were found to have materials which may be unsuitable for the application.

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

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

**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 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.

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

The identified conditions are legacy issues. The inappropriate valve material condition existed since 1990 in Unit 1. The pressure instrumentation potentially inappropriate material issue has existed in the CPNPP design since licensing of Unit 1 (February 8, 1990) and Unit 2 (February 2, 1993).

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

The Unit 1 airlock valve's safety function is to provide containment pressure boundary integrity as part of a closed system inside containment.

The Unit 1 airlock hydraulic system penetrates the containment pressure boundary. The airlock hydraulic system achieves containment integrity by being a closed system. A loss of pressure boundary integrity of 1BS-0053 would open the hydraulic system to containment and would no longer meet General Design Criteria 57 (GDC-57) for a closed system. This valve can be isolated by closing 1BS-0038 and 1BS-0037 outside containment. These containment isolation valves are normally maintained closed except when the airlocks are in use. If they were open at the time of the accident, it is likely that they would be accessible and be closed by an operator prior to 15 days.

The function of the pressure instruments on Units 1 and 2 are to indicate differential pressure across the doors during manual operation of the airlock.

Exposure of these pressure instruments to Design Basis Accident environment (Containment Spray containing sodium hydroxide) would compromise their integrity as they are principally constructed of materials which may be unsuitable for the application. This loss of integrity would violate the redundancy of the Containment pressure boundary integrity of the Reactor Buildings. The outer isolation barrier would still provide isolation from the safeguards building.

In either scenario described above, approximately 15 days after a LOCA event, the containment radiological and pressure conditions would significantly be reduced. Out-leakage from the pressure instrumentation would be mitigated by the outer airlock boundary. Out-leakage from the Unit 1 airlock hydraulic valve would not be expected because containment pressure would have to be sufficient to evacuate the hydraulic fluid past the closed containment isolation valves and overcome the static head pressure in the hydraulic reservoir. Any out-leakage would still be filtered through the plant ESF ventilation system.

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).

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**IV. CAUSE OF THE EVENT**

The personnel airlock valve and pressure gauges material was installed during original construction and discovered as a result of a licensee self-assessment. In 1990, it was discovered that the Unit 1 personnel airlock (PAL) was not being tested or operated in accordance with the design and technical specifications. The ASME isolation valves were being operated normally open instead of normally closed. The corrective action changed the design of the hydraulic system from Non-Nuclear Safety to ANSI Safety Class 2 and allowed the ASME isolation valves to remain normally open. Review of the design specification for the PAL indicates specific material requirements were not applied to components/subcomponents outside of the ASME boundary, such as is the case with 1BS-0053. This condition was caused by a failure to properly assess the ANSI Safety Class 2 reclassification of aluminum containing components inside containment.

**V. CORRECTIVE ACTIONS**

As a compensatory measure, the personnel airlock hydraulic system valve (1BS-0053) inside containment was encased in stainless steel to prevent exposure of the valve body to the sodium hydroxide in the containment spray. In accordance with the CPNPP Corrective Action Program, the airlock pressure gauges inside containment have been removed and replaced with a stainless steel plug to prevent a loss of the redundancy of the containment pressure boundary during and after a LOCA. Permanent corrective action will assure these parts are replaced with those made of suitable materials.

**VI. PREVIOUS SIMILAR EVENTS**

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