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CP-201500048
TXX-15008

10 CFR 50.73

January 19, 2015

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT (CPNPP)
DOCKET NO. 50-445
LICENSEE EVENT REPORT 445/14-003-00, SAFETY CHILLER INOPERABLE FOR LONGER
THAN ALLOWED BY TECHNICAL SPECIFICATIONS

Dear Sir or Madam:

Enclosed is Licensee Event Report (LER) 445/14-003-00, "Safety Chiller Inoperable For Longer Than Allowed by Technical Specifications," for Comanche Peak Nuclear Power Plant (CPNPP) Unit 1.

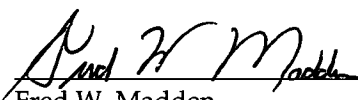
This communication contains no new licensing basis commitment regarding CPNPP Units 1 and 2.

Should you have any questions, please contact Mr. Jimmy Seawright at (254) 897-0140.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By: 
Fred W. Madden
Director, External Affairs

Enclosure

c - Marc L. Dapas, Region IV
Balwant K. Singal, NRR
Resident Inspectors, Comanche Peak

IE22
NRR



LICENSEE EVENT REPORT (LER)

(See Page 2 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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

2. DOCKET NUMBER

05000

445

3. PAGE

1 OF 5

4. TITLE

Safety Chiller Inoperable for Longer Than Allowed by Technical Specifications

5. EVENT DATE

MONTH	DAY	YEAR
11	20	2014

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO.
14	003	00

7. REPORT DATE

MONTH	DAY	YEAR
1	19	2015

8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCKET NUMBER
	05000
FACILITY NAME	DOCKET NUMBER
	05000

9. OPERATING MODE

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

1	<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)
100	<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 checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

Timothy A. Hope, Manager, Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

(254) 897-0140

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
X	KM	CHU		Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO15. EXPECTED
SUBMISSION
DATE

MONTH	DAY	YEAR

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

On August 28 2014, the condenser pressure on the Unit 1, train A Safety Chiller was determined to be 20 psig and rising. On November 20, 2014, a past operability review was completed that determined the Unit 1, train A Safety Chiller was inoperable for approximately 192 hours from August 21, 2014 to August 29, 2014, which exceeded the 72 hour completion time of Technical Specification 3.7.19. The cause of this event was the pressure switch on the safety chilled water purge system failed to actuate a purge valve to remove non-condensable gases from the Safety Chiller. Corrective actions included replacement of the purge high pressure switch and revising the maintenance procedures to require a verification of the purge unit function on start-up of the chiller prior to declaring the chiller operable.

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

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Comanche Peak	05000 445	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 5
		14	- 003	- 00	

NARRATIVE**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" as a result of the train A Safety Chiller exceeding its LCO completion times, and 10CFR50.73(a)(2)(v)(D) "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident" as a result of certain train B supported equipment being out of service for planned work during the train A Safety Chiller period of inoperability.

B. PLANT CONDITION PRIOR TO THE EVENT

During this time period, Comanche Peak Nuclear Power Plant (CPNPP) Unit 1 was operating in Mode 1, stable at or near 100% power. The train A Safety Chiller was aligned for normal operations with no plant protection system actuation signals present.

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 July 28, 2014, the Unit 1, train A Safety Chiller [EIS:(KM)(CHU)] Refrigerant Low Pressure was recorded at 8" Hg, the high end of the vacuum pressure range. The chiller was determined to be Operable, and a troubleshooting work order was initiated.

On August 7, 2014, the trouble shooting plan determined that the purge unit pressure switch was not closing at the switch setpoint. If the pressure switch contacts do not close, then air collected in the purge unit will not be vented. The Unit 1, train A Safety Chiller was determined to be operable since there were no significant air leaks that would require the purge unit to cycle on a continual basis. Plans were made to replace the switch in the upcoming refueling outage in October.

On August 15, 2014, the Unit 1, train A Safety Chiller High Refrigerant Pressure Indicator went high out of specification. Subsequent to August 15, 2014, readings varied from 16 to 18 psig. It was determined that the Safety Chiller would continue to operate as required at this elevated pressure and support the mission time.

On August 28 2014, at 1508 the condenser pressure on the Unit 1, train A Safety Chiller was determined to be 20 psig and rising. The chiller trip setpoint is 45 PSIG. At 2215 on August 28, 2014, the Unit 1, train A Safety Chiller was determined to be inoperable.

On August 29, 2014, at 0137 a work order was written to vent non-condensable gases, adjust the purge unit, and replace the pressure switch. At 1230, the Unit 1, train A Safety Chiller was determined to be operable.

On November 20, 2014, a past operability review was completed that determined the Unit 1, train A Safety Chiller was inoperable for approximately 192 hours from August 21, 2014 to August 29, 2014, which exceeded the 72 hour completion time of Technical Specification 3.7.19.

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

Maintenance personnel (Utility, Non-licensed) determined that the purge unit was not working and noted that there was air in the condenser which was affecting condenser and evaporator pressures.

II. COMPONENT OR SYSTEM FAILURES

The pressure switch on the safety chilled water purge system failed.

A. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

The contact for the pressure switch did not change state when the set point was reached.

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

Maintenance personnel determined that when the switch would actuate at the set point pressure the actuation of the micro-switch could be heard. When the micro-switch was actuated, the contact state remained in the open configuration which did not allow the purge solenoid valve to open and vent out the non-condensable gases from the condenser.

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

The pressure switch on the safety chilled water purge system actuates a purge valve to remove non-condensable gases from the Safety Chillers to maintain optimum efficiency of the chillers. The Safety Chillers provide cooling for the safety chilled water system which, in turn, provides essential chilled water to the emergency fan coil units (EFCUs) during normal and accident conditions. EFCUs are provided in the motor-driven ESF pump rooms (i.e., Centrifugal Charging Pump rooms, Safety Injection Pump rooms, Residual Heat Removal (RHR) Pump rooms, Containment Spray Pump rooms, motor-driven Auxiliary Feedwater (AFW) Pump rooms), in the Spent Fuel Pool Cooling Pump rooms, in the Component Cooling Water (CCW) Pump rooms, in the UPS Rooms, and in the Class 1E electrical switchgear rooms. The system is designed to provide chilled water to maintain the ambient air temperature within the design limits of the essential equipment served by the system.

D. FAILED COMPONENT INFORMATION

Manufacturer: Penn/Johnson Controls

Model/Part Number: P70EA-9 (York Part Number 025-17676-000)

Type of Pressure Switch: Mechanical with a NC and a NO set of electrical contacts

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 THE SAFETY SYSTEM TRAIN INOPERABILITY

The Unit 1, train A Safety Chiller was inoperable from August 21, 2014 to August 29, 2014.

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C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The Unit 1 train A Safety Chiller was determined to be inoperable from August 21, 2014 to August 29, 2014. During that time, the train B Safety Chilled Water System was operable.

Since the Safety Chillers provide a support function for many safety systems and the impact of a loss of the Unit 1, train A Safety Chiller could have cascaded to these safety systems, a review of Station Log entries was conducted for possible affected safety systems supported by the train B Safety Chiller during the period from August 21, 2014 to August 29, 2014 (while the train A Safety Chiller was inoperable). The review indicated that there were three occasions where train B safety equipment was declared inoperable that was supported by room coolers from the train B safety chilled water, two occasions on 8/23/2014 and a third time on 8/28/2014. All three occasions were noted as planned entries into TS Limiting Conditions for Operation.

The following train B equipment was out of service and inoperable during this period.

Train B Equipment	Date	Duration
Component Cooling Water System (TS 3.7.7)	August 23, 2014	12 minutes
Station Service Water (TS 3.7.8)	August 23, 2014	12 minutes
Emergency Diesel Generator (TS 3.8.1)	August 23, 2014	12 minutes
Containment Spray System (TS 3.6.6)	August 23, 2014	1 hours and 32 minutes
Motor Driven Auxiliary Feedwater Pump	August 28, 2014	3 hours and 40 minutes

These planned evolutions are considered safety system functional failures per 10CFR50.73(a)(2)(v)(D) since the train A Safety Chiller was considered inoperable and thus, the supported systems would likewise be affected. However, the train B equipment evolutions were conducted per established procedures, promptly, and without evident delay. Since the evolutions were under Operations control and virtually certain of successful completion, the above activities could have been terminated and the train B equipment returned to service as needed to fulfill a safety function.

Other train B or common system/area TS entries observed during the subject period were not impacted by the inoperability of the Safety Chiller.

There were no failures or degraded conditions of any train B or common equipment, other than noted above, that, when combined with the inoperability of the train A Safety Chiller, would have resulted in a complete loss of a specified safety function.

The Safety Significance of the identified condition is low, since the train B Safety Chiller cooling function remained available during the subject period from 8/21/2014 through 8/29/2014, and no interim actions were required during the planned evolutions to reduce the effect on Nuclear Safety.

An evaluation was completed to document the risk increase for the Comanche Peak Nuclear Power Plant (CPNPP) associated with the Unit 1 train A Safety Chiller air intrusion and automatic purge unit failure event. The risk evaluation for the Unit 1 train A Safety Chiller inoperability focused on the increase in risk, in terms of Δ CDF and Δ LERF, for the times that the Safety Chiller would have failed to run for a 24 hours period (equal to the PRA mission time). The failure was conservatively assumed to be whenever the condenser pressure was greater than 17 psi.

The risk evaluation demonstrated that the increase in plant risk was not risk significant for the times the condenser pressure exceeded 17 psi as the results did not exceed the industry accepted thresholds for risk significance from the PSA Applications Guide of $1\text{E-}06$ for Δ CDF and $1\text{E-}07$ for Δ LERF.

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IV. CAUSE OF THE EVENT

The purge high pressure switch on the Unit 1 train A Safety Chiller did not perform as required which prevented the chiller from purging non-condensables gases (air) from the condenser. The significance of post maintenance entrained air, the elevated condenser pressure, and a failed purge unit was not recognized to be a degraded condition that required monitoring or compensatory actions to maintain the equipment in an operable condition. Post maintenance entrained air combined with in-leakage of air caused an air pocket in the condenser to continue to expand and increasingly blanket component cooling water tubes that impacted the heat exchange capacity of the condenser.

The understanding of the failure of the purge unit on a refrigerant cooling system is unique to the Safety Chiller system. Other than the Safety Chillers, there are no other safety related chillers with purge units. Other safety related cooling units are high pressure systems which do not operate any portion of the system under vacuum where in-leakage could occur.

V. CORRECTIVE ACTIONS

The purge high pressure switch was replaced and a manual purge was performed. This returned the purge unit to full functionality. Maintenance procedures are being changed to require a verification of the purge unit function on start-up of the chiller prior to declaring the chiller operable. Improved monitoring, updating design bases documents with the purge unit functions, adding preventative maintenance for the pressure switch, and other programmatic enhancements related to the Safety Chillers are also being adopted as part of the corrective action program.

VI. PREVIOUS SIMILAR EVENTS

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