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Group Vice President

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


SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
CONDITION PROHIBITED BY TECHNICAL SPECIFICATIONS
LICENSEE EVENT REPORT 91-029-00

Gentlemen:

Enclosed is Licensee Event Report 91-029-00 for Comanche Peak Steam Electric Station Unit 1, "Technical Specification Violation Due to Steam Supply Valves to the Turbine Driven Auxiliary Feedwater Pump Being Isolated in Mode 3".

Sincerely,

William J. Cahill, Jr.

By: 
William G. Guldmond
Manager, Site Licensing

NH/tg

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (2)

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NRC FORM 366A		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC, 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.	
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I. DESCRIPTION OF THE REPORTABLE EVENT**A. REPORTABLE EVENT CLASSIFICATION**

Any operation or condition prohibited by the plant's Technical Specifications (T/S).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On December 4, 1991, at 1530 Comanche Peak Steam Electric Station (CPSES) Unit 1 had just completed its first refueling and had been shutdown for approximately 60 days. The Unit was in Mode 3, coolant temperature was approximately 370 degrees (°) Fahrenheit (F) and increasing to prepare for plant operation.

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.

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

During the Fall, 1991 refueling outage, clearances were hung that required the handswitches for the steam supply valves to the Turbine Driven Auxiliary Feedwater (TDAFW) Pump (EHS:(P)(BA)) to be positioned in pull-to-lock. All clearances that affected these handswitches were released by 1003 on December 4. The handswitch positions were left in pull-to-lock, thus defeating the automatic function of these valves (EHS:(V)(BA)). There are two steam supply valves supplying steam to the TDAFW Pump. Each valve has a corresponding handswitch on a Main Control Board (EHS:(MCBD)(BA)) in the Control Room. The handswitch positions are close, auto, and open. When the handle is taken to pull-to-lock the valve is closed and all automatic functions are defeated. The TDAFW Pump and associated flow paths are required in Modes 1, 2, and 3. There is, however, a T/S 4.0.4 exception for the TDAFW Pump surveillance test when entering Mode 3, because the surveillance requires steam header pressure to be greater than 532 PSIG. There is not, however, a T/S 3.0.4 exception for the TDAFW Pump.

<small>NRC FORM 305A</small>		<small>U.S. NUCLEAR REGULATORY COMMISSION</small>		<small>APPROVED OMB NO. 3150-0104</small> <small>EXPIRED: 4/30/92</small> <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.</small>	
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<p> The Limiting Condition for Operation (LCO) and surveillance requirements as applied to Mode change and the operability of the TDAFW Pump lead to misinterpretation of the T/S by two operating shifts. Normally, a system must be proven operable by performing a surveillance test to demonstrate that it can perform its intended safety function prior to changing to the Mode the LCO becomes applicable. A T/S 4.0.4 exception allows the Mode change without performing the surveillance only when specifically stated in the surveillance requirement. A T/S 3.0.4 exception allows the Mode change without meeting the requirements of an LCO prior to changing to the Mode the LCO becomes applicable. The Unit Supervisor (utility, licensed) and Reactor Operator (utility, licensed) misinterpreted the T/S 4.0.4 exception, believing the TDAFW Pump was not expected to be in standby readiness until sufficient steam pressure was available to test it. The previous operating crew drew the same conclusion and signed off the step in the operating procedure stating that the AFW System was aligned in standby, when in fact, only the Motor Driven Auxiliary Feedwater (MDAFW) Pumps (EIS:(P)(BA)) were aligned properly. Both crews knew the steam supply valves were shut and made the conscious decision to leave them shut. This misinterpretation was caused by the operating crews believing (and is usually true) that equipment is operable when the surveillance test is performed satisfactorily. The crews knew that the TDAFW Pump surveillance could only be performed when the secondary steam supply pressure was greater than 532 PSIG; therefore, it was incorrectly assumed that the TDAFW train must not be required for operation until the surveillance test was completed. As a result, the crews assumed that the LCO for AFW had a 3.0.4 exception when, in fact, it did not. Operators failed to realize that the 4.0.4 exception was for the TDAFW Pump test only, that there was no 3.0.4 exception for the TDAFW Pump, and that the entire Auxiliary Feedwater (AFW) System (EIS:(BA)) needed to be in alignment for standby readiness and not just the MDAFW Pumps and associated flow paths. </p> <p> The Unit Supervisor and Reactor Operator incorrectly assumed that the proper valve lineup for the TDAFW Pump was not required until the surveillance test was run. The position of these handswitches was being tracked by the administrative tracking system for Mode required equipment and systems. Mode 3 was entered at 1333 on December 4 with the auxiliary feedwater pump turbine steam supply valve handswitches in pull-to-lock. The Shift Supervisor (utility, licensed), who knew the handswitches needed to be in auto, discovered the discrepancy at 1530 while making a Main Control Board walkdown. The switches were immediately placed in the auto position. </p>					

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The AFW System Operability Surveillance Test on the TDAFW Pump was completed and the pump confirmed operable at 0534 on December 7, 1991.

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

The handswitches for the steam supply valves to the TDAFW Pump were found in the pull-to-lock position by the Shift Supervisor during a control board walkdown.

II. COMPONENT OR SYSTEM FAILURES

A. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

There were no failed components that contributed to the event.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

There were no failed components that contributed to the event.

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

There were no failed components that contributed to the event.

D. FAILED COMPONENT INFORMATION

There were no failed components that contributed to the event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

There was no safety system responses that occurred as a result of this event.

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B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Mode 3 was entered at 1333 on December 4. The handswitches were discovered in pull-to-lock at 1530 and were immediately placed in auto (standby readiness); therefore, the TDAFW train was inoperable for approximately 1 hour, 57 minutes. However, during this time, early in Mode 3, there was insufficient steam pressure to allow the TDAFW Pump to produce its rated flow.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The AFW System is designed to provide a supply of high-pressure feedwater to the secondary side of the Steam Generators (SG) (EIS:(SD)(SB)) to ensure the Reactor Coolant System (RCS) (EIS:(AB)) can be cooled to <350°F following a total loss of Main Feedwater (EIS:(SJ)). Three AFW pumps and associated flow paths are required to be operable in Modes 1, 2, and 3. Immediately after entering Mode 3, however, there is insufficient steam header pressure to drive the TDAFW Pump to produce its rated flow and pressure. Both MDAFW Pumps were operating to supply feedwater to all four SGs during this event. In addition, the unit had just been refueled and shutdown for 60 days, thus very little decay heat was being produced. While in this condition, sufficient heat removal capability was available through the SGs to cool the RCS to <350°F, should a loss of feedwater occur. Because of these factors, at no time during this period did an actual condition exist that threatened the health or safety of the public.

The root cause of this event was the failure to realize that the T/S 4.0.4 exception was for the TDAFW Pump test only, and not for AFW System alignment for standby readiness; therefore, it is unlikely that this condition would exist when the secondary steam supply pressure is >532 psig.

IV. CAUSE OF THE EVENTS**ROOT CAUSE**

Cognitive error by Operators assuming that there was a 3.0.4 exception to the LCO requiring the TDAFW Pump and associated flow path be operable when entering Mode 3 from Mode 4.

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Operators failed to realize that the 4.0.4 exception was for the TDAFW Pump test only, that there was no 3.0.4 exception for the TDAFW Pump, and that the entire AFW System needed to be in alignment for standby readiness and not just the MDAFW Pumps.

CONTRIBUTING FACTOR

The requirement for the TDAFW Pump and associated flow path to be operable prior to entering Mode 3 from Mode 4 is unusual and contrary to the normal handling of plant equipment.

This misinterpretation was caused by the Operators believing (and is usually true) that equipment is operable when the surveillance test is performed satisfactorily. The Operators knew that the TDAFW Pump surveillance could only be performed when the secondary steam supply pressure was greater than 532 PSIG; therefore, it was incorrectly assumed that the TDAFW train must not be required for operation until the surveillance test was completed. As a result, the Operators assumed that the LCO for AFW had a 3.0.4 exception when, in fact, it did not.

V. CORRECTIVE ACTIONS

A. IMMEDIATE CORRECTIVE ACTIONS

Upon discovery, the handswitches were placed in the auto (standby readiness) position.

B. CORRECTIVE ACTIONS TO PREVENT RECURRENCE

ROOT CAUSE

Cognitive error by Operators assuming that there was a 3.0.4 exception to the LCO requiring the TDAFW Pump and associated flow path be operable.

CORRECTIVE ACTIONS

1. The personnel involved were coached by the Operations Manager on the event.

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- Enhanced training will be provided to licensed operators on the requirements of T/S sections 3.0 and 4.0 as it applies to the AFW System.

CONTRIBUTING FACTOR

The requirement for the TDAFW Pump and associated flow path to be operable prior to entering Mode 3 from Mode 4 without performing the surveillance test is unusual and contrary to the normal handling of plant equipment.

CORRECTIVE ACTIONS

- Enhance procedures to clearly identify AFW operability requirements when entering Mode 3 from Mode 4.

VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar events reported which occurred due to a lack of understanding by operators of T/S 3.0.4 or 4.0.4.

VII. ADDITIONAL INFORMATION

The times listed in the report are approximate and Central Standard Time.