TU ELECTRIC

Log # TXX-91036
File # 10200
Ref. # 50.73(a)(2)(i)

February 14, 1991

William J. Cahill, Jr.
Executive Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
OPERATION PROHIBITED BY TECHNICAL SPECIFICATIONS
LICENSEE EVENT REPORT 90-036-01

Gentlemen:

Enclosed is Licensee Event Report 90-036-01 for Comanche Peak Steam Electric Station Unit 1, "Personnel Error Resulting in Failure to Comply With Technical Specification Action Requirements."

Sincerely,

William J. Cahill, Jr.

JAA/bm

Enclosure

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

IE22
1/1

Enclosure to TXX-91036

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Title (4)

PERSONNEL ERROR RESULTING IN FAILURE TO COMPLY WITH TECHNICAL SPECIFICATION ACTION REQUIREMENTS

Event Date (5)			LER Number (6)			Report Date (7)			Other Facilities Involved (8)	
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Numbers
1 0	1 5	9 0	9 0	- 0 3 6	- 0 1	0 2	1 4	9 1	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

Operating Mode (9): 1

Power Level (10): 0 6 5

This report is submitted pursuant to the requirements of 10 CFR §: (Check one or more of the following) (11)

- 20.402(b)
- 20.405(a)(1)(i)
- 20.405(a)(1)(ii)
- 20.405(a)(1)(iii)
- 20.405(a)(1)(iv)
- 20.405(a)(1)(v)
- 20.405(c)
- 50.36(c)(1)
- 50.36(c)(2)
- X 50.73(a)(2)(i)
- 50.73(a)(2)(ii)
- 50.73(a)(2)(iii)
- 50.73(a)(2)(iv)
- 50.73(a)(2)(v)
- 50.73(a)(2)(vii)
- 50.73(a)(2)(viii)(A)
- 50.73(a)(2)(viii)(B)
- 50.73(a)(2)(x)
- 73.71(b)
- 73.71(c)
- Other (Specify in Abstract below and in Text, NRC Form 366A)

Licensee Contact For This LER (12)

Name	Telephone Number
T. A. HOPE, SUPERVISOR, COMPLIANCE	Area Code 8 1 7 — 8 9 7 - 1 6 3 7 0

Complete One Line For Each Component Failure Described in This Report (13)

Cause	System	Component	Manufacturer	Reportable To NPRDS		Cause	System	Component	Manufacturer	Reportable To NPRDS	

Supplemental Report Expected (14)

- ☐ Yes (If yes, complete Expected Submission Date)
- X No

Expected Submission Date (15): Month | Day | Year

Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On October 15, 1990, Comanche Peak Steam Electric Station Unit 1 was in Mode 1, Power Operation, with the reactor at 65 percent of rated thermal power. While performing a routine system/area walkdown, the system engineer for the Primary Plant Ventilation System discovered that one of two Train B Engineered Safety Features (ESF) filtration units was out of service. The unit remained out of service until October 23, 1990, when Control Room personnel again discovered the condition while attempting to perform required surveillance testing. It was determined that the ESF filtration unit inoperability exceeded the time limit prescribed by the associated Technical Specification. The cause of the event was determined to be personnel error. Corrective action includes event review and a system design modification.

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Text (If more space is required, use additional NRC Form 366A's) (17)

I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

Any operation prohibited by the plant's Technical Specifications.

B. PLANT OPERATING CONDITIONS BEFORE THE EVENT

On October 15, 1990, at approximately 1000 CDT (Discovery date), Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operation, with the reactor at 65 percent of rated thermal power.

On October 31, 1990 (Reportability date), CPSES Unit 1 was in Mode 1 with reactor power at approximately 100 percent.

Between October 15 and October 31 the plant was operated continuously in Mode 1 with reactor power between 64 percent and 100 percent.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

On October 15, 1990, the Hi-Hi temperature switch on one of two Train B Primary Plant Ventilation System (PPVS) (EIIS:(VL)) Engineered Safety Features (ESF) filtration unit heaters (EIIS:(EHTR)) was found in the tripped position. The switch (EIIS:(VL)(TS)) trips when the heater reaches the Hi-Hi temperature setpoint, turning off both heaters in the unit and preventing the associated exhaust fan (EIIS:(VL)(FAN)) from starting. The switch must be manually reset before the exhaust fan may be restarted.

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

At approximately 1000 CDT on October 15, 1990, while performing a system/area walkdown, a system engineer (contractor, non-licensed) observed a lighted control board annunciator window indicating a problem with the PPVS exhaust filtration units. The system engineer consulted with the PPVS system engineer (utility, non-licensed), and after reviewing the related drawings, the two system engineers requested permission to examine the relays in the associated auxiliary relay rack to verify the cause of the alarm. The system engineers discovered one relay actuated, indicating a heater trip on one of two Train B ESF filtration units.

The system engineers informed the Reactor Operator (utility, licensed) that the heater was tripped, that the exhaust fan would not start until the Hi-Hi temperature switch was manually reset, and that the filtration unit should be considered inoperable. The system engineers then initiated a work request to troubleshoot and reset the switch.

On October 23, 1990, Control Room personnel were performing surveillance testing to demonstrate operability of the PPVS ESF filtration units. The exhaust fan in the filtration unit with the tripped heater switch would not start. The crew ascertained the source of the problem and dispatched an Auxiliary Operator (utility, non-licensed) to reset the switch. The switch was reset at about 0100 CDT, the fan was immediately started for the surveillance run, and testing activities were successfully completed.

A short time later, the work order initiated by the system engineers on October 15 to reset the tripped Hi-Hi temperature switch was processed through the Control Room. The Shift Supervisor (utility, licensed), aware of the previous problem encountered during testing of the ESF filtration unit, queried for details of the work order and the effect that the condition had had on component and system operability. Initial review indicated that one Train B PPVS ESF filtration unit had been out of service for at least seven days and fifteen hours. The related Technical Specification requires the restoration of an inoperable ESF filtration train to operable status within 7 days or a reduction of plant operational mode. On October 31, 1990, the event was determined to be reportable pursuant to 10CFR50.73.

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II. COMPONENT OR SYSTEM FAILURES

A. FAILED COMPONENT INFORMATION

Not applicable - there were no component failures directly related to this event. The event is the result of less than adequate personnel performance. The inoperability of the PPVS ESF filtration unit established the conditions under which the personnel error was committed, but the inoperability of the unit was not the initiating event.

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

Not applicable - there were no component failures directly related to this event.

C. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable - there were no component failures directly related to this event.

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

Not applicable - there were no component failures directly related to this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Not applicable - there were no safety system responses associated with this event.

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B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

One of two Train B ESF filtration units was incapable of performing its intended function from discovery on October 15, 1990, at 1000 CDT, until being returned to service on October 23, 1990, at 0100 CDT, a period of at least 7 days and 15 hours. Review of the Unit Log revealed that the filtration unit was last operated on October 4, 1990. This is considered to be the most probable date for actuation of the Hi-Hi temperature switch.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The ESF Atmospheric Filtration System consists of four primary plant ESF exhaust filtration units, two per train, which are required to operate after a licensing basis accident to maintain greater than -0.05 inches water gauge pressure in the primary plant pressure envelope (consisting of the auxiliary building, the fuel building, and parts of the safeguards building), and to remove radioiodines from exhaust air directed to the plant vent stacks.

Filtration Units 01 and 02 were originally the only two filtration units designed as ESF units (refer to Figure 1). Filtration Units 15 and 16 were upgraded to ESF design criteria in 1988. These units are identical except for the following: filtration units 01 and 02 are provided with an exhaust register which removes air from its respective room. This register, added as part of the ESF upgrade of filtration units 15 and 16, functions to exhaust excess heat generated by the two fan motors and heaters in each ventilation equipment room while running both filtration units per train in post-accident configuration.

Each ESF filtration unit is equipped with two High Efficiency Particulate Air (HEPA) filters and one carbon adsorber filter. The carbon adsorber filter functions to remove gaseous radioiodines from the exhaust air following a licensing basis accident. To protect the carbon adsorber beds from degradation, each ESF filtration unit contains two heater banks which energize upon fan start to reduce the relative humidity of the exhaust air to 70 percent. The heater banks in the ESF exhaust filtration units are controlled by four temperature switches. Two are designated as Hi temperature (automatic reset) switches and two are Hi-Hi temperature (manual reset) switches.

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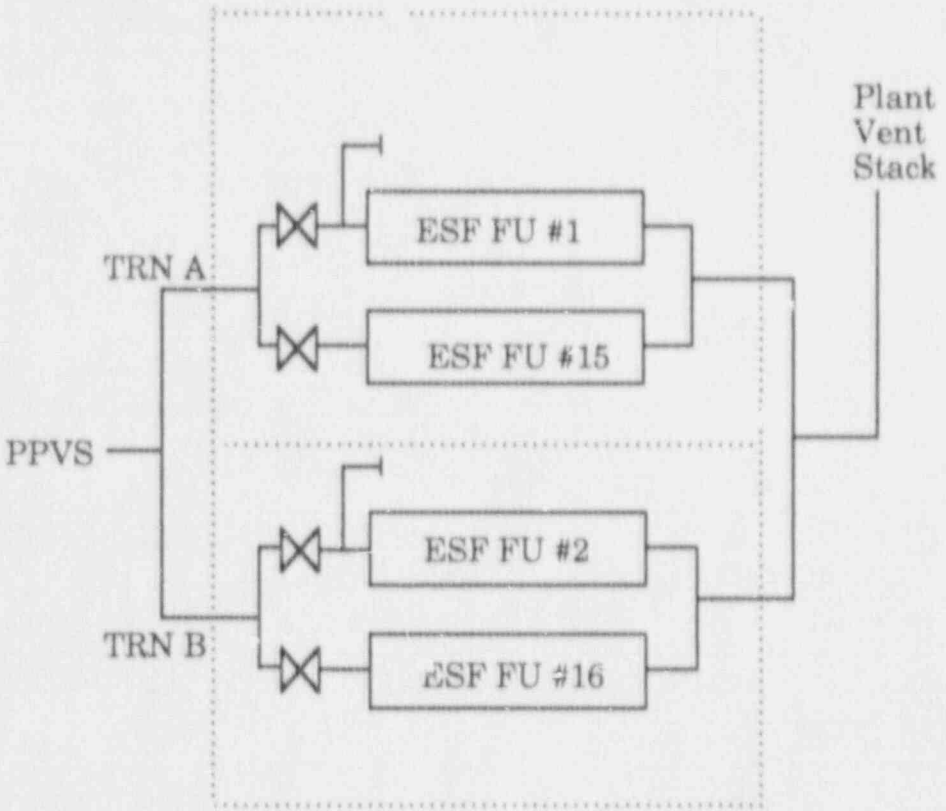

Figure 1

The Hi temperature switches function to cycle the heaters on and off to maintain exhaust air temperature at 185 degrees F. The Hi-Hi temperature switch will trip the heaters off when the exhaust air temperature exceeds 215 degrees F. A heater trip on Hi-Hi temperature will trip the exhaust fan for that filtration unit. The Hi-Hi temperature switches must be manually reset at the filtration unit by removing a panel and pushing a plunger-like switch.

An evaluation was performed to access the potential impact of operation with one of the two Train related ESF filtration units out of service. Operation in this configuration was evaluated to determine the effects on system capability for maintaining required negative building pressures, adequate filtration capacity, satisfactory vent stack monitoring flow, and adequate equipment room cooling.

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The original system design consisted of a single ESF filtration unit and fan per train. Additional ESF filtration capacity was added to aid in attaining the desired negative building pressures; the upgrade was not related to filter cleanup capacities or other system design criteria. Subsequent testing has demonstrated the capability of a single ESF filtration unit for maintaining the required building pressures. A review of the applicable design calculation indicates that the additional equipment room cooling capacity provided by the suction registers associated with ESF filtration units 01 and 02 is required only with two fan motors and heaters running in each room. With only one unit in service, exhaust flow through the suction register is not required to satisfy the cooling requirements in the room.

It is concluded that operation with one unit of PPVS ESF exhaust filtration unavailable does not represent a reduction in the capability of the system to perform its intended safety function. The event did not adversely affect the safe operation of CPSES Unit 1 or the health and safety of the public.

IV. CAUSE OF THE EVENT

ROOT CAUSE NO. 1

The Reactor Operator failed to take the proper action when provided information concerning equipment operability. Although aware that the PPVS ESF filtration unit was rendered inoperable by the heater trip, the reactor operator failed to notify the Unit Supervisor or Shift Supervisor, or to appropriately document the condition.

ROOT CAUSE NO. 2

Contrary to the requirements of station procedures, the system engineers did not inform the shift supervisor upon discovery of a problem they believed to affect operability of an ESF component, but rather informed the reactor operator.

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CONTRIBUTING FACTORS

The associated annunciator receives inputs from twelve non-ESF fans, four ESF fans, and four ESF filtration unit heaters. The large number of differing causes for this alarm dilutes the effectiveness at alerting operators to problems with the safety-related fans and filtration unit heaters. In addition, the alarm procedure associated with this annunciator did not contain sufficient information to allow the operator to determine the source of the input to the alarm. Nor did the procedure contain clear guidance to advise Control Room personnel that with the heater tripped the unit is inoperable.

During the period prior to October 15, one non-ESF filtration unit fan was out of service for an extended period and other non-ESF filtration units were out of service for brief periods. Due to the extended presence of the illuminated annunciator window, diminished sensitivity to the presence of the alarm led to the failure by successive operating crews to identify the cause of the alarm prior to discovery by the system engineer on October 15.

V. CORRECTIVE ACTIONS

Corrective Action for Root Causes: In addition to individual counselling, the results of the incident investigation will be placed in the Operations and the System Engineering Lessons Learned Notebooks to reinforce the need for accurate communication when reporting plant problems.

Corrective Action for the Contributing Factor: A design modification has been initiated to reroute all ESF alarm inputs to a separate window. The alarm procedure was revised to provide specific instructions for identification of an ESF heater trip, and an explanation of the effects on filtration unit operability was added. In addition to normal reviews performed during shift turnover, random reviews of the annunciator panels were initiated by plant management, and an item was placed in the Shift Orders to heighten the Operators' awareness to the ventilation panel alarms. Operator performance and sensitivity to annunciators has been satisfactorily demonstrated.

A review of the annunciator alarms within the horseshoe area was initiated to verify that Technical Specification requirements were adequately addressed. Due to the higher degree of familiarity with systems which annunciate in the horseshoe area, it was

determined that existing procedures adequately address these issues. A review of other alarm procedures associated with ventilation systems will be performed to verify that Technical Specifications and potential effects on equipment operability are adequately addressed.

Additional Corrective Actions: During event investigation it was determined that certain information contained in the alarm procedure was no longer applicable. A change was initiated to correct and clarify the information in the alarm procedure.

VI. PREVIOUS SIMILAR EVENTS

CPSES Licensee Event Reports (LERs) 90-012-00 and 90-022-00 describe reportable events resulting from failure to comply with Technical Specification action requirements. However, the details of the events described in those LERs and the resultant corrective actions are sufficiently different from the details of this event to conclude that the previous corrective actions could not be expected to have prevented the error described in this report.