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William J. Cahill, Jr.
Executive Vice President

December 5, 1990

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NO. 50-445
MANUAL OR AUTOMATIC ACTUATION OF ANY ENGINEERED SAFETY FEATURE
LICENSEE EVENT REPORT 90-038-00

Gentlemen:

Enclosed is Licensee Event Report 90-038-00 for Comanche Peak Steam Electric Station Unit 1, "Gas Channel Alarm Initiated a Containment Ventilation Isolation Due to Stagnant Air Pockets in Containment."

Sincerely,

William J. Cahill, Jr.

William J. Cahill, Jr.

By: Roger D. Walker
Roger D. Walker
Manager of Nuclear Licensing

DEN/daj

Enclosure

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

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Enclosure to TXX-901021

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

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.

LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
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Title (4)

GAS CHANNEL ALARM INITIATED A CONTAINMENT VENTILATION ISOLATION DUE TO STAGNANT AIR POCKETS IN CONTAINMENT

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 1	0 5	9 0	9 0	- 0 3 8	- 0 0	1 2	0 5	9 0	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

Operating Mode (9)	5
Power Level (10)	0 0 0

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

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

Licensee Contact For This LER (12)

Name	Telephone Number Area Code
T. A. HOPE — COMPLIANCE SUPERVISOR	8 1 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 November 5, 1990, Comanche Peak Steam Electric Station Unit 1 was in Mode 5, Cold Shutdown, with a containment purge in progress. The Containment Air Cooling and Recirculation System (CACRS) fans were running, recirculating air inside containment. Approximately three hours after shifting the CACRS fans, a Containment Airborne Contamination High Radiation alarm was received which initiated a Containment Ventilation Isolation. The increase in Noble Gas activity was attributed to stagnant air pockets in containment that were subsequently mixed when the CACRS fans were shifted, causing an increase in detected airborne activity. The root cause was determined to be a phenomenon in which stagnant air with a higher Noble Gas content existed during a containment purge along with having the high alarm set point on the gaseous monitor set too conservatively for the existing conditions. Corrective actions are to revise containment purge procedures to ensure a good mixing of the containment atmosphere prior to purging and to review the guidelines for radioactive effluent releases, to ensure that set points are not set so conservatively that automatic safety functions are actuated unnecessarily.

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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 event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System.

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On November 5, 1990, just prior to the condition Comanche Peak Steam Electric Station Unit 1 was in Mode 5, Cold Shutdown, with reactor coolant temperature approximately 123 degrees Farenheit. The Containment Air Cooling and Recirculation System (CACRS) fans 1 and 2 (EIIS:(BK)(FAN)) were operating, recirculating air inside containment. Personnel air lock (PAL) doors (EIIS:(NH)(AL)) were open and a containment purge was in progress.

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

At 2344, November 4, 1990, with the plant in Mode 5, a containment purge was started. This was the initial purge prior to containment entry. At 0034, November 5, 1990, both PAL doors were opened. At 1913, two CACRS fans were switched, shutting down fan 3 and starting up fan 2 in accordance with the equipment rotation procedure. An increase in airborne contamination levels was detected by the containment Particulate, Iodine, Gaseous (PIG) Monitor gaseous monitoring channels (EIIS:(IK)(RA)). The PIG gas channel showed an increase due to Noble

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Gases. The Noble Gases were from fission product buildup inside containment during the operating cycle. After entering Mode 5, the PIG gas channel Containment Airborne Contamination High Radiation (High Alarm) set point was lowered from 2.00E-4 microcuries per milliliter (μCi/ml) to 1.26E-4 μCi/ml due to lower radiation background levels. The Offsite Dose Calculation Manual (ODCM) calculated High Alarm set point for this release was 1.82E-2 μCi/ml, over 144 times greater than the actual High Alarm set point. The lower set point was chosen as a conservative measure to ensure that any change in airborne contamination levels would alert the operator. The set point is derived from administrative procedures that specify the set point to be three times a ten minute trend of containment atmosphere gaseous activity. The Containment Airborne Contamination High Radiation Alert Alarm (Alert Alarm) is set at 80 percent of the High Alarm.

Approximately two hours after the CACRS fans were switched, an Alert Alarm was received from the PIG gas channel. A Radiation Protection technician (utility, non-licensed) was contacted and the channel was monitored. The Radiation Protection technician and the Shift Supervisor (utility, licensed) concluded that the Noble Gases were from stagnant pockets of air that were mixed when the CACRS fans were shifted at 1913 and that no work was in progress that would release radioactive gas. At 2159, a High Alarm on the PIG gas channel was received and a Containment Ventilation Isolation (CVI) occurred as designed. At 2220 hours, both CACRS fans were shutdown, a containment evacuation was ordered, and a containment preaccess filter unit was started. At 2245 the containment PAL doors were shut. All CACRS fans were started at 2310 and the High Alarm cleared. At 2359 the Nuclear Regulatory Commission was notified of the event via the Emergency Notification System pursuant to 10CFR50.72(b)(2)(ii). At 0010, November 6, 1990, normal access to containment was restored, but one Personnel Airlock door was maintained shut. At 0407, CVI was reset and the containment purge was commenced.

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

A Containment Airborne Contamination High Radiation alarm was received from a PIG gas channel followed by a CVI.

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II. COMPONENT OR SYSTEM FAILURES

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

No failed components contributed to this event.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

No failed components contributed to this event.

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

No failed components contributed to this event.

D. FAILED COMPONENT INFORMATION

No failed components contributed to this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

A CVI occurred when a Containment Airborne Contamination High Radiation alarm was received from a PIG gas channel. Operators verified that the CVI occurred as designed.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

No safety system trains were inoperable as a result of this event.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The increased airborne contamination level detected by the PIG gas channel was due to stagnate air in containment that was mixed when CACRS fans were shifted. The detector set point for the High Alarm (CVI actuation) had been moved to a conservative set point. The PIG is not required to provide a CVI function in Mode 5. No maintenance or operation had occurred that could have caused the increased Noble Gas reading. At no time during the event were any release limits violated. No significant exposure was received by anyone inside containment during this event. At no time during this period did an actual condition exist that threatened the health or safety of the public.

IV. CAUSE OF THE EVENT

ROOT CAUSE

1. The root cause was determined to be a phenomenon in which stagnant air with a higher Noble Gas content existed during a containment purge. The phenomenon was discovered when CACRS fans were switched and the stagnant air was moved to the air stream of the PIG gaseous radiation detector causing an increase in detected airborne contamination which actuated the CVI.

2. The high alarm set point on the gaseous monitor was set too conservatively for the existing conditions.

GENERIC CONSIDERATIONS

Radiation monitor set points must be set conservatively to quickly identify problems before they escalate, yet set points must not be set so conservatively that automatic protective functions are challenged unnecessarily.

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V. CORRECTIVE ACTIONS

CORRECTIVE ACTIONS TO PREVENT RECURRENCE

ROOT CAUSE

1. The root cause was determined to be a phenomenon in which stagnant air with a higher Noble Gas content existed during a containment purge. The phenomenon was discovered when CACRS fans were switched and the stagnant air was moved to the air stream of the PIG gaseous radiation detector causing an increase in detected airborne contamination which actuated the CVI.

CORRECTIVE ACTION

The containment ventilation procedure is being revised to eliminate the possibility of this event from occuring by securing a purge whenever CACRS fans are shifted and allowing gas channel readings to stabilize before reinitiating the purge.

2. The High Alarm set point on the gaseous monitor was set too conservatively for the existing conditions.

CORRECTIVE ACTION

The administrative procedure for radioactive effluent releases, which provides guidance on radioactive effluent monitor set points, is being reviewed to ensure that set points are not set so conservatively that automatic safety functions are actuated unnecessarily. This review will take into account the changes made to the containment ventillation procedure prescribed in above.

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CORREC :VE ACTION

The administrative procedure for radioactive effluent releases, which provides guidance on radioactive effluent monitor set points, is being reviewed to ensure that set points are not set so conservatively that automatic safety functions are actuated unnecessarily.

VI. PREVIOUS SIMILAR EVENTS

There have been no previous similar events reported pursuant to 10CFR50.73.

VII. ADDITIONAL INFORMATION

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