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April 25, 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
EVENT OR CONDITION THAT COULD HAVE PREVENTED FULFILLMENT
OF THE SAFETY FUNCTION OF STRUCTURES OR SYSTEMS
LICENSEE EVENT REPORT 91-012-00


Gentlemen:

Enclosed is Licensee Event Report 91-012-00 for Comanche Peak Steam Electric Station Unit 1, "Potential Gas Binding of Centrifugal Charging Pumps due to Voids in the Boric Acid Gravity Feed Line."

Sincerely,

William J. Cahill, Jr.

By:


W. G. Guidemond
Manager, Site Licensing

JAA/bm

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

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PDR ADOCK 05000445
S PDR

400 North Olive Street L.B. 81 Dallas, Texas 75201

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NRC FORM 988 <h2 style="text-align: center;">LICENSEE EVENT REPORT (LER)</h2>	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.
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Facility Name (1) COMANCHE PEAK - UNIT 1	Docket Number (2) 0151010141415	Page (3) 1 OF 016
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Title (4)
POTENTIAL GAS BINDING OF CENTRIFUGAL CHARGING PUMPS DUE TO VOIDS IN THE BORIC ACID GRAVITY FEED LINE

Event Date (6)			LER Number (8)		Report Date (7)			Other Facilities Involved (8)		
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Numbers
03	26	91	91	0112	0	03	25	91	N/A	015101010111
									N/A	015101010111

Operating Mode (9) 5	This report is submitted pursuant to the requirements of 10 CFR § (Check one or more of the following): (11)									
Power Level (10) 01010	<input type="checkbox"/> 20.402(b) <input type="checkbox"/> 20.405(a)(1)(i) <input type="checkbox"/> 20.405(a)(1)(ii) <input type="checkbox"/> 20.405(a)(1)(iii) <input type="checkbox"/> 20.405(a)(1)(iv) <input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c) <input type="checkbox"/> 50.36(a)(1) <input type="checkbox"/> 50.36(a)(2) <input type="checkbox"/> 50.73(a)(2)(i) <input type="checkbox"/> 50.73(a)(2)(ii) <input type="checkbox"/> 50.73(a)(2)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv) <input type="checkbox"/> 50.73(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(vi) <input type="checkbox"/> 50.73(a)(2)(vii)(A) <input type="checkbox"/> 50.73(a)(2)(vii)(B) <input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 79.71(b) <input type="checkbox"/> 79.71(c) Other (Specify in Abstract below and in Text, NRC Form 988A)						

Licensee Contact For This LER (12) Name T. A. HOPE			Telephone Number 8117 819171-16131710		
Compliance Supervisor COMPLIANCE SUPERVISOR			Area Code 8117		

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

Cause	System	Component	Manufacturer	Responsible To NRCDS	Cause	System	Component	Manufacturer	Responsible To NRCDS

Supplemental Report Expected (14)				Expected Submission Date (15)	Month	Day	Year	
<input type="checkbox"/> Yes (If yes, complete Expected Submission Date)				<input checked="" type="checkbox"/> No				

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

Ultrasonic examination of the Chemical and Volume Control System (CVCS) suction piping was performed on March 4, through March 15, 1991. These examinations revealed voids in the alternate boration line and the gravity feed line from the Boric Acid Storage Tank (BAT). Engineering evaluation shows that voids in the alternate boration line would not affect operability of the Centrifugal Charging Pumps (CCPs). However, engineering evaluation indicates that the void in the gravity feed line from the BAT could cause damage to or gas binding of the CCPs.

The potential root cause was identified as hydrogen coming out of solution, in the lower pressure CCP suction header. Corrective actions include daily venting of the gravity feed line and further monitoring for hydrogen accumulation. Based on the results of this monitoring, venting requirements will be established.

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: 90.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-690), 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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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 alone could have prevented the fulfillment of the safety function of structures or systems that are needed to shutdown the reactor and maintain it in a safe condition, or mitigate the consequences of an accident.

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On March 26, 1991, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 5, Cold Shutdown, with the Reactor Coolant System (RCS) (EIS:(AB)) at a temperature of 130 degrees Fahrenheit and pressure of approximately 300 pounds per square inch-gage.

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 directly to the event.

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

On October 29, 1990, Westinghouse sent a letter to CPSES regarding the formation and venting of hydrogen in the Chemical and Volume Control System (CVCS) (EIS:(CB)) in response to Nuclear Regulatory Commission (NRC) Information Notice (IN) 90-64, "Potential for Common-Mode Failure of High Pressure Safety Injection Pumps or Release of Reactor Coolant Outside Containment During a Loss-of-Coolant Accident." In this letter Westinghouse, identified locations in the CVCS suction piping where gases would tend to accumulate. Westinghouse recommended ultrasonic examination to monitor the rate at which gas accumulates in these locations.

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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-630), 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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Text (If more space is required, use additional NRC Form 366A's) (1.7)					
<p>From March 4, 1991, through March 15, 1991, ultrasonic examination of various locations of the CVCS suction piping was performed. Locations examined included the 8 inch diameter suction header; the Positive Displacement Charging Pump (PDP) (EISS:(P)(CB)) suction line; the Centrifugal Charging Pump (CCP)-02 (EISS:(P)(CB)) miniflow line; and all of the vertical piping connected to the 8 inch diameter suction header, including alternate boration, boric acid filter, chemical feed, and the gravity feed line from the Boric Acid Storage Tank (BAT) (EISS:(TK)(CB)).</p> <p>The ultrasonic examinations revealed voids in two locations, the 2 inch diameter alternate boration line and the 3 inch diameter gravity feed line from the BAT. The size of the void identified in the alternate boration line was determined to be relatively small. Engineering evaluation shows that a void in this line would not cause any significant degradation in CCP or PDP performance, or affect operability of the Emergency Core Cooling System (ECCS) (EISS:(BQ)). The size of the void found in the BAT gravity feed line was much larger. Engineering evaluation indicates that this void could potentially cause damage to or gas binding of the CCPs when the BAT gravity feed line is used for boration, forcing the gas bubble into the suction header, or when pressure conditions change causing expansion of the bubble into the suction header.</p> <p>On March 26, 1991, this event was recorded via the appropriate administrative procedure. The reportability of this event was uncertain at first, however, after further evaluation it was determined to be reportable at 1645 on March 28, 1991. At 1840 on March 28, 1991, the NRC Operations Center was notified via the Event Notification System.</p> <p>E. <u>THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE OR PROCEDURAL ERROR</u></p> <p>Ultrasonic examination of various locations of the CVCS suction piping was performed due to concerns expressed by Westinghouse in their October 29, 1990, letter. As a result of the examinations, conducted from March 4, 1991, through March 15, 1991, voids in two locations of CVCS suction piping were identified.</p>					

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Facility Name (1) COMANCHE PEAK - UNIT 1	Docket Number (2) 05000445911	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3">LER Number (6)</th> <th colspan="3">Page (3)</th> </tr> <tr> <th>Year</th> <th>Sequential Number</th> <th>Revision Number</th> <th></th> <th></th> <th></th> </tr> <tr> <td style="text-align: center;">91</td> <td style="text-align: center;">012</td> <td style="text-align: center;">010</td> <td style="text-align: center;">014</td> <td style="text-align: center;">OF</td> <td style="text-align: center;">016</td> </tr> </table>	LER Number (6)			Page (3)			Year	Sequential Number	Revision Number				91	012	010	014	OF	016
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Text (If more space is required, use additional NRC Form 366A's) (17)

II. COMPONENT OR SYSTEM FAILURES

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

Not applicable - there were no component failures associated with this event.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable - there were no component failures associated with this event.

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

Not applicable - there were no component failures associated with this event.

D. FAILED COMPONENT INFORMATION

Not applicable - there were no component failures associated with this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Not applicable - there were no component failures associated with this event.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Not applicable - there were no safety systems which were rendered inoperable due to a failure.

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

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.

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C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The operability of two independent ECCS subsystems, as required by Technical Specifications 3/4.5.2, ensures that sufficient emergency core cooling capability will be available in the event of a Loss of Coolant Accident assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators (EIS:(ACC)(BP)) is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits.

During this event the potential for gas binding of the CCPs existed due to void accumulation in the CVCS suction piping. This increased the probability of a common-mode failure of both independent ECCS subsystems.

IV. CAUSE OF THE EVENT

ROOT CAUSE

Evaluation of this event has identified the potential root cause to be hydrogen coming out of solution in the lower pressure CCP suction header and collecting in the vertical piping. This phenomenon is not present under current plant conditions (Mode 5), and therefore cannot be verified until normal RCS hydrogen concentration is re-established.

V. CORRECTIVE ACTIONS

A. IMMEDIATE

The gravity feed line from the BAT was vented. Administrative controls were established to vent this line daily.

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 B. <u>CORRECTIVE ACTIONS TAKEN TO PREVENT RECURRENCE</u>							
<u>ROOT CAUSE</u>							
Evaluation of this event has identified the potential root cause to be hydrogen coming out of solution in the lower pressure CCP suction header and collecting in the vertical piping.							
<u>CORRECTIVE ACTION</u>							
The gravity feed line from the BAT will be monitored for hydrogen accumulation upon return to normal hydrogen concentration in the RCS. Based on the results of this monitoring, venting requirements will be established.							
 VI. <u>PREVIOUS SIMILAR EVENTS</u>							
On October 4, 1990, NRC IN 90-64 was issued. During evaluation of IN 90-64 it was concluded that a design error existed that could result in the common-mode failure of the CCPs due to gas binding (the CCP suction piping, high point, solenoid-operated isolation vent valves (SOIV) (EHS:(FSV)(CB)) were oriented in the wrong direction). This condition was addressed in Licensee Event Report (LER) 90-035.							
As a result of the October 29, 1990, letter from Westinghouse addressing the SOIV orientation, various locations in the CVCS suction piping were identified as having the potential for gas to accumulate. The subsequent ultrasonic examinations are the subject of this LER (91-012).							
 VII. <u>ADDITIONAL INFORMATION</u>							
The times listed in the report are approximate and Central Standard Time.							