

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9110240027 DOC.DATE: 91/10/11 NOTARIZED: NO DOCKET #  
 FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397  
 AUTH.NAME AUTHOR AFFILIATION  
 FULLER,R.E. Washington Public Power Supply System  
 BAKER,J.W. Washington Public Power Supply System  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-025-00:on 910911,train A of containment atmosphere control sys rendered inoperable for more than 30-day limit permitted by TS.Caused by loss of oil from recombiner blower.Train A & recombiner blower repaired.W/911011 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6  
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

Docket No. 50-397

October 11, 1991  
602-91-185

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

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 91-025

Dear Sir:

Transmitted herewith is Licensee Event Report No. 91-025 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,



J. W. Baker  
WNP-2 Plant Manager

Enclosure:  
Licensee Event Report No. 91-025

cc: Mr. John B. Martin, NRC - Region V  
Mr. C. Sorensen, NRC Resident Inspector (M/D 901A)  
INPO Records Center - Atlanta, GA  
Ms. Dottie Sherman, ANI  
Mr. D. L. Williams, BPA (M/D 399)  
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EXPIRES: 4/30/92

## LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)

Washington Nuclear Plant - Unit 2

DOCKET NUMBER (2)

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PAGE (3)

TITLE (4) TRAIN OF THE CONTAINMENT ATMOSPHERE CONTROL SYSTEM RENDERED INOPERABLE LONGER THAN ALLOWED BY THE TECHNICAL SPECIFICATIONS DUE TO LOSS OF OIL IN HYDROGEN RECOMBINER BLOWER

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 NUMBER(S)
0	9	1	1	9	1	0	2	5		0 5 0 0 0
0	9	1	1	9	1	0	2	5		0 5 0 0 0
OPERATING MODE (9)		4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
POWER LEVEL (10)		0, 0, 0	20.402(b)			20.405(e)			50.73(a)(2)(iv)	73.71(b)
			20.405(a)(1)(i)			50.38(c)(1)			50.73(a)(2)(v)	73.71(c)
			20.405(a)(1)(ii)			50.38(c)(2)			50.73(a)(2)(vii)	
			20.405(a)(1)(iii)		X	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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

R. E. Fuller, Compliance Engineer

TELEPHONE NUMBER

AREA CODE

5 0 9 3 7 1 7 1 4 1 4 8

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	B	B	A	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

YES (If yes, complete EXPECTED SUBMISSION DATE)

X NO

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

On September 11, 1991, a Plant Technical Engineer determined that Train A of the Containment Atmosphere Control (CAC) System, i.e., hydrogen recombiner, had been inoperable longer than the 30 days allowed by the Technical Specifications due to a loss of the oil from the recombiner blower caused by a drain plug vibrating free. Based on immediate failure of the recombiner blower during a surveillance test, it was concluded that the plug vibrated free during the previous surveillance test. This resulted in approximately four months of Plant operation with one train of the CAC System inoperable.

The immediate corrective action was to repair the inoperable CAC Train A and lockwire the drain plugs in the Train A recombiner blower.

The root cause for failure of the CAC train was less than adequate procedures for reassembly of the blower.

Corrective actions include: 1) lockwires have been installed on the drain plugs to the Train B hydrogen recombiner blower, 2) change the appropriate procedures to require the drain plugs in each recombiner blower to be properly torqued, lockwired, and verified, and 3) a Maintenance and Operations Bulletin will be issued advising use of positive locking ability on critical pipe plugs of vibrating equipment.

The safety significance of this event is negligible because CAC Train B was operable and only one train is required to mitigate the consequences of a postulated design basis accident.

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 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)

Plant Conditions

Power Level - 0%  
Plant Mode - 4

Event Description

On September 11, 1991, a Plant Technical Engineer determined that Train A of the Containment Atmosphere Control (CAC) System had been inoperable longer than the 30 days allowed by the Technical Specifications due to a loss of the oil caused by a loss of a drain plug in the recombiner blower during the previous surveillance test. This was based on a surveillance test performed on September 3, 1991, in which the hydrogen recombiner blower to Train A failed almost immediately after initiation. The previous surveillance test on December 8, 1990, was successful and provided no indication of any abnormalities in Train A. The Plant was shutdown for the Refueling outage on April 12, 1991, which resulted in Plant operation for approximately four months with one CAC train inoperable.

On September 3, 1991, the CAC hydrogen recombiner functional test for Train A was initiated. Following an approximate 30-minute preheat cycle, the hydrogen recombiner blower, CAC-FN-1A, received an auto-start signal. The System Engineer indicated that approximately six seconds later the blower motor tripped on a low flow signal. There is a six (6) second time delay for the low flow trip signal to allow the blower to establish an adequate flow rate. The blower motor drew excessive current, representative of a locked-rotor condition.

At 1435 hours on September 3, 1991, the CAC hydrogen recombiner Train A, CAC-HR-1A, was declared inoperable. CAC Train A inoperability was discovered while in Plant condition Mode 4, in which there is no Technical Specification requirement for the CAC System to be operable.

On September 4, 1991, the hydrogen recombiner blower, CAC-FN-1A, was removed from the CAC Train A skid (CAC-HR-1A). A bottom oil drain plug to the blower housing was found lying at the bottom of the blower-motor assembly container. Approximately 25 ounces of oil had drained out of the blower housing into the blower-motor assembly container. The container drains into the container drain piping that connects to the Residual Heat Removal (RHR) System via a loop seal, which ultimately drains to the Suppression Pool via RHR-V-134A. Some oil was removed from the loop seal by blowing pressurized air through the loop seal to an external drain. Some oil remains on the inside surface to the drain piping and some, very little, may have reached the Suppression Pool. However, the quantity of oil that remains is considered to have no effect on the performance of the CAC System or any other Plant safety related equipment or structures.

After uncoupling the motor from the blower, the motor was found to turn freely, but the blower was seized. Disassembly of the blower revealed the bearing surfaces were galled and had become overheated.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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

Evaluation by the Plant Technical Engineer determined that CAC-FN- 1A had probably been in an inoperable condition following the last surveillance in December, 1990. The evaluation concluded that the drain plug vibrated free during the December 8, 1990 surveillance resulting in loss of oil and subsequent galling and overheating of the bearing surfaces, which caused bearing seizure on cool down from the surveillance. This conclusion was based on the fact that the Plant Technical Engineer witnessed the Train A blower motor receive a trip signal from the low flow monitor several seconds after the motor start signal was initiated. This time delay is consistent with the six (6) second time delay for the low flow trip signal discussed above. The apparent instantaneous motor trip following timing out of the time delay switch indicates that the motor reached locked-rotor current within the time delay period. Undamaged bearing surfaces, even with no oil film, would take much longer to cause complete seizure of the blower, which is powered by a 12-hp motor. This further indicates that the bearing surfaces of the blower were in a seized condition prior to the start of the surveillance. Therefore, loss of oil from the blower occurred during the previous surveillance test as a result of the drain plug vibrating free, rendering Train A of the CAC System incapable of performing its safety function since December 8, 1990.

Immediate Corrective Actions

The immediate corrective action was to initiate repair of Train A of the CAC System and to lockwire all drain plugs in the blower housing to prevent recurrence.

Further Evaluation and Corrective ActionA. Further Evaluation

1. This event is reportable per 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the Plant's Technical Specifications. Based on the determination that Train A of the CAC system was inoperable from December 8, 1990 to September 3, 1991, and the Plant was in Mode 1 until April 12, 1991, the Plant exceeded the Technical Specification Action requirements to restore the inoperable train of the CAC System within 30 days, or be in at least Hot Shutdown within the next 12 hours by approximately 4 months.
2. There were no other structures, components, or systems inoperable prior to the event which contributed to the event.
3. The root cause for failure of the CAC train was that the procedures for reassembly of the blower were less than adequate because torquing requirements and verification were not specified to ensure the drain plugs do not vibrate loose during operation.

LICENSEE EVENT REPORT (LER)  
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

3.1 The hydrogen recombiner blower is a straight, two-lobe, rotary compressor (Roots Blower) that normally experiences significant vibration versus blade-type fans. The CAC skid was provided by Air Products and Chemical Company who obtained the recombiner blower, Model 3006/Series 30, Serial Number 147, from Schwitzer Division of Wallace Murry Corporation. Blower reassembly procedures did not provide torque requirements for the drain plugs or independent verification. Consequently, the skill of the craft was relied upon to provide proper torquing and verification. The reassembly procedures were inadequate for this application because the container around the blower-motor assembly precludes post-operation visual inspection for loosening drain plugs, leaking oil, oil level, or freedom of rotation. Generally, all other Plant safety related equipment is accessible to periodic inspection for the conditions described above.

3.2 Water was introduced into the Train A recombiner blower during the R-5 outage when the CAC skid drain valve to the Suppression Pool, RHR-V-134A, was left open while the Residual Heat Removal (RHR) System was discharging into the Suppression Pool. Enough RHR discharge pressure was developed to force water back into the CAC skid drain lines and fill the CAC recombiner blower-motor container and blower-motor with water. The blower-motor was subsequently removed, cleaned, and reinstalled. Cleaning of the blower required draining the oil by removing one or more of the three drain plugs. After reinstallation, the system was operated for a period of 8 hours to assure operability. The as-found condition of the drain plugs in the Train A blower was not documented. The maintenance procedure for the blower did not require a specific torque value for the drain plugs, but instead relied on the skill of the craft to apply the appropriate torque.

Prior to R-5, there had been no operability problems with the CAC recombiner blower in either train. The blower-motor assembly in Train B of the CAC System was removed for the first time since both CAC skids were considered operable in December, 1983. The drain plugs were inspected and lockwires installed on all of the drain plugs as was done for the Train A blower. The drain plugs in the Train B blower were found to be tight. Circumstantial evidence indicates that the drain plug that fell out of the Train A blower was reinstalled with less than adequate torque during reassembly in R-5.

**B. Further Corrective Action**

1. Lockwires have been installed on the drain plugs of the hydrogen recombiner blower to Train B of the CAC System.
2. Change the appropriate procedures to require the drain plugs in each recombiner blower to be properly torqued, lockwired, and verified.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

3. A Maintenance and Operation Bulletin will be issued to appraise craft and System Engineers of the necessity to ensure positive locking ability for critical pipe plugs in vibrating equipment.

Safety Significance

The safety significance of this event is negligible because CAC Train B was operable and only one train is required to mitigate the consequences of a design basis accident. Also, no event occurred during the period of CAC System inoperability that required the CAC System to perform its safety function.

Similar Events

There were no similar events.

EIIS InformationText ReferenceSystemEIIS Reference  
Component

Wetwell	NH	
Drywell	NH	
Residual Heat Removal System	BO	
Suppression Pool System	BT	
Reactor Containment	NH	
Containment Atmosphere Control System	BB	
Hydrogen Recombiner Blower (CAC-FN-1A, CAC-FN-1B)	BB	BLO
Flow Monitor	BB	FI
Residual Heat Removal Valve (RHR-V-134A)	BO	V