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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-006-00:on 940330,dicovered broken weld betwwen flag termanal & Negative post of HPCS battery HPCS-B1-DG3.Caused by poor equipment design.Damaged battery cell replaced. W/940429 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

April 29, 1994
G02-94-098

NCR 294-0245

Docket No. 50-397

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

Subject: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21
LICENSEE EVENT REPORT NO. 94-006-00

Transmitted herewith is Licensee Event Report No. 94-006-00 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.

Should you have any questions or desire additional information, please call me or D.A. Swank at (509) 377-4563.

Sincerely,

J.V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

JVP/KBL/my
Enclosure

cc: LJ Callan - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
NS Reynolds, Winston & Strawn
R Barr, NRC Sr. Resident Inspector (Mail Drop 927N, 2 Copies)
INPO Records Center - Atlanta, GA
DL Williams, BPA (Mail Drop 399)

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	1 OF 5

TITLE (4)
BROKEN HPCS-B1-DG3 BATTERY FLAG TERMINAL WELD

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(S)
0 3	3 0	9 4	9 4	-- 0 0 6	-- 0	0 4	2 9	9 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10): 8 4 .5

20.402(b)	20.405(C)	50.73(a)(2)(iv)	77.71(b)
20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.73(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
Kurt B. Lewis, Licensing Engineer	AREA CODE 5 0 9 3 7 7 - 4 1 4 5

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
MO	EC B	BA TT RY	C 1 73	No					

SUPPLEMENTAL REPORT EXPECTED (14)

	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO			

ABSTRACT (16)

On March 30, 1994, at 1330 hours, with the plant at 84.5% power, a system engineer walking down the High Pressure Core Spray system (HPCS) discovered a broken weld between the flag terminal and the negative post of HPCS battery HPCS-B1-DG3 cell #58. This flag terminal joins the HPCS battery feeder cable to its associated post.

At 1415 hours, main control room personnel declared the HPCS system inoperable. At 1526 hours, control room personnel notified the NRC via ENS of the event. Immediate corrective action consisted of replacing the damaged battery cell.

The probable cause for this event was poor equipment design of the HPCS battery enclosure. The enclosure hampers personnel from effectively performing associated maintenance activities. Further corrective action includes improving the design of the battery enclosure.

This event had no safety significance. After HPCS battery cell replacement, engineering and electrical maintenance personnel tested the damaged cell and determined that the cell was able to perform its safety function in its as-found condition. The HPCS system was inoperable for less than twenty-four hours during replacement of the battery cell and verification of replacement-cell operability.

Plant Conditions

Power Level - 84.5%
Plant Mode - 1 (Power)

Event Description

On March 30, 1994, at 1330 hours, with the plant at 84.5% power, a system engineer walking down the HPCS system discovered a broken weld between the flag terminal and the negative post of battery HPCS-B1-DG3 cell #58. This flag terminal joins the HPCS battery feeder cable to its associated post. At 1415 hours, the HPCS system was declared inoperable. At 1526 hours, the NRC was notified via ENS of the problem.

Immediate Corrective Action

Immediate corrective action consisted of replacing the damaged battery cell. On March 31, 1994, at 0228 hours, after the damaged cell was replaced and the replacement surveilled, Operations declared the battery operable. Upon completion of testing of Emergency Diesel Generator HPCS-GEN-DG3 and High Pressure Core Spray Pump HPCS-P-1, Operations declared them operable.

Further Evaluation, Root Cause, and Corrective Action

Further Evaluation

1. There were no other structures, systems, or components inoperable at the time that contributed to this event.

2. On March 30, 1994, the system engineer who discovered the problem telephoned the battery manufacturer. The manufacturer was not able to confirm that the battery would supply its required load during an accident. The manufacturer recommended replacing cell #58 of the HPCS-B1-DG3 battery.

3. On April 6, 1994, a review of databases including the INPO Network, Washington Public Power Supply System Operating Experience Reviews (OER), Problem Evaluation Requests (PERs), and the Nuclear Plant Reliability Data System (NPDRS) identified no similar problems with this particular type of battery.

4. A review of prior work documents and interviews with electrical maintenance staff determined that the flag terminal (with the broken weld) on HPCS battery cell #58 had been identified as being loose in May 1993 by an electrical craftsman performing work on the HPCS battery. The craftsman noted the condition in the work package Comments section. However, the craftsman did not verbally communicate this fact to the electrical supervisor designated to review the completed package. The supervisor who reviewed the work package incorrectly believed that the condition had been corrected and did not act on the technician's note.

5. On April 19, 1994, plant personnel tested the damaged flag terminal and its associated cell to confirm that the cell was capable of sustaining its design load profile for two hours. Test results demonstrated that the cell would have performed its design safety function in its as-found condition.

6. On April 21, 1994, plant personnel performed a pull-test on the damaged flag terminal. The pull-test indicated a capacity which exceeded the maximum expected tensile force resulting from a Safe Shutdown Earthquake. Thus, the flag terminal was capable of performing its intended safety function in its as-found condition.

Root Cause

The probable cause for the broken weld was a battery equipment enclosure design that makes work on the HPCS battery difficult. This results in the need for extra care when working around the HPCS battery. The enclosure could have caused a person climbing into or working within the enclosure to make accidental contact with the battery cable and damage the flag terminal.

The cause of the condition going uncorrected since May 1993 was less than thorough communication of the problem by the craftsman and a less than thorough review of the work package by the supervisor.

Further Corrective Action

1. On April 20, 1994, the Electrical Department Supervisor counseled the craftsman and his immediate supervisor involved with the May 1993 HPCS battery work package. Counseling consisted of emphasizing the severity of the event and the lessons learned. During the counseling, the Electrical Department Supervisor emphasized the need for a questioning attitude and thorough communication.

2. On April 20, 1994, the Electrical Department Supervisor conducted an electrical shop meeting. During the meeting, the expectations for thorough reviews of work packages and resolution of related comments were emphasized.

3. On April 28, 1994, the Electrical Shop Supervisor conducted an electrical shop meeting. During the meeting, the need for personnel to use caution when they work within the HPCS battery enclosure was re-emphasized.

4. A plant modification will be implemented to improve the design of the HPCS battery enclosure by Refueling Outage R-10.

Safety Significance

High Pressure Core Spray Pump HPCS-P-1 maintains reactor water inventory after a small-break Loss Of Coolant Accident (LOCA). Medium voltage critical bus SM-4 powers the HPCS pump motor. Medium voltage noncritical bus SM-2 normally powers critical bus SM-4. When SM-2 is unavailable, Emergency Diesel Generator HPCS-GEN-DG3 supplies emergency backup power to bus SM-4. In part, the 58 cell 125 vdc HPCS-B1-DG3 battery and its companion charger supply direct current to the HPCS-GEN-DG3 field flash circuit.

As previously described, load profile testing and pull-testing on the damaged flag terminal and its associated cell demonstrated that the cell would have been able to perform its safety function in its as-found condition. Offsite power remained available throughout the time required for battery cell replacement. Thus, HPCS was capable of performing its safety function using offsite power at all times, and using emergency power except during battery cell replacement. Further, during the time that the HPCS system was inoperable during HPCS battery cell replacement, the Reactor Core Isolation Cooling system (RCIC) was available as an alternate high-pressure injection system. Similarly, the Automatic Depressurization system (ADS) was available to emergency depressurize the reactor, and the Residual Heat Removal system (RHR) and the Low Pressure Core Spray system (LPCS) were available to provide low-pressure injection and spray to the reactor. Therefore, this event had no safety significance.

Similar Events

There are no LERs describing battery terminal connection problems that are similar to this event.

EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
HPCS System	BG	
HPCS Battery HPCS-B1-DG3		BTRY
HPCS Emergency Diesel Generator HPCS-GEN-DG3		DG
High Pressure Core Spray Pump HPCS-P-1		P
Critical Bus SM-4		BU
Noncritical Bus SM-2		BU
Reactor Core Isolation Cooling System (RCIC)	BN	
Automatic Depressurization System (ADS)	SB	
Residual Heat Removal System (RHR)	BO	
Low Pressure Core Spray System (LPCS)	BM	