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SUBJECT: LER 90-017-00:on 900830,HPCS sys inoperability as result of 125-volt dc battery & DG fuel oil switch inoperability.

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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 1, 1990

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 90-017

Dear Sir:

Transmitted herewith is Licensee Event Report No. 90-017 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 (M/D 927M)
WNP-2 Plant Manager

JWB:lr

Enclosure:
Licensee Event Report No. 90-017

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)
NRC Resident Inspector - walk over copy

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH 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)
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	1 OF 0 6

TITLE (4) High Pressure Core Spray System Inoperability As a Result of 125 VDC Battery and Diesel Generator Fuel Oil Level Switch Inoperability

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 5 0 0 0
0 8	3 0	9 0	9 0	— 0 1 7	— 0 0	1 0	0 1	9 0		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 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)	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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
W. S. Davison, Compliance Engineer	AREA CODE 5 0 9 — 3 7 7 — 2 5 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) X 2 7 2 6

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
X	E J	B T R Y	G 1 7 3	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 1	1 5	9 1

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

Three related instances of inoperablility of the High Pressure Core Spray System (HPCS) occurred over a twenty day period. On August 30, 1990, at 1234 hours, during performance of weekly Technical Specification-required surveillance tests, High Pressure Core Spray System (HPCS) 125 VDC Battery cell number nine was discovered to contain a crack in the cell jar. The HPCS 125 VDC Battery was declared inoperable along with the HPCS System. On August 31, 1990, at 0515 hours, while the HPCS System was still inoperable, during performance of HPCS Diesel Generator (HPCS DG) operability surveillance tests, it was noted that DO-LS-21, fuel oil level switch for the HPCS fuel oil day tank (DO-TK-3C) was exhibiting questionable performance. As a result, at 1132 hours, the HPCS Diesel Generator was declared inoperable. On September 6, 1990, at 1350 hours, while performing the weekly Technical Specification battery checks, an electrical maintenance technician discovered that the HPCS 125 VDC Battery voltage was below the value allowed in Technical Specifications. The HPCS Battery and the HPCS System were declared inoperable. It was discovered that Battery voltage had been 0.75 VDC below the minimum value listed in Technical Specifications since August 31, 1990. On September 17, 1990, at 0957 hours, in preparation for the replacement of the cracked battery cell, the HPCS System was declared inoperable, however, the cell was not replaced that day. On September 18, 1990, at 1217 hours, again in preparation for the replacement of the cracked battery cell, the HPCS System was declared inoperable. At 1415 hours the HPCS System was declared operable after replacement of battery cell number nine.

Abstract (contd.)

The root cause analysis is still in progress at this time. Corrective actions which have been identified consist of required reading of the LER by licensed operators, providing written guidance to operations personnel concerning HPCS reportability and modification of the operator requalification training program to include information concerning HPCS reportability. This event posed no threat to the safety of Plant Personnel or the Public.

Plant Conditions

a) Plant Mode - 1 (Power Operation)
b) Power Level - 100%

Event Description

On August 30, 1990, at 1234 hours, during performance of weekly Technical Specification required surveillance tests, High Pressure Core Spray System (HPCS) 125 VDC Battery cell number nine was discovered to contain a crack in the cell jar. The HPCS 125 VDC Battery was declared inoperable along with the HPCS System and the LCO Action statements required by the WNP-2 Technical Specifications for the Emergency Core Cooling Systems (3.5.1) and Electrical Power Systems D.C. Sources - Operating (3.8.2) were entered. Evaluation was then started to plan a course of action. After review by the oncoming Shift Manager and consultation with the Plant Technical Compliance staff, the event was evaluated as reportable by telephone to the NRC per the requirement of 10CFR50.72(b)(2)(iii) within four hours of event discovery. A telephone call was then made to the NRC Bethesda Operations Center at 1832 hours, approximately six hours after event discovery. On August 31, 1990, at 1931 hours, HPCS Battery cell number nine was jumpered out of the battery and the Technical Specification Action statements were exited.

On August 31, 1990, at 0515 hours, during performance of HPCS Diesel Generator (HPCS DG) operability surveillance tests, it was noted that DO-LS-21, fuel oil level switch for the HPCS fuel oil day tank (DO-TK-3C) was exhibiting questionable performance. At 1132 hours, the HPCS Diesel Generator was declared inoperable and the LCO Action statement for the Technical Specification for Electrical Power Systems A.C. Sources - Operating (3.8.1.1) was entered. At 1349 hours, DO-LS-21 was tested and confirmed to operate properly. At 1709 hours, DO-LS-21 was restored to operable status after successful completion of the HPCS DG Semi-annual Operability Test. Cell number nine of the HPCS 125 VDC Battery was jumpered out, the HPCS DG and HPCS System were restored to operable status, and the Technical Specification LCO Action statements were exited at 1938 hours.

On September 6, 1990, at 1350 hours, while performing the weekly Technical Specification battery checks, an electrical maintenance technician discovered that the HPCS 125 VDC Battery voltage was below the value allowed in Technical Specifications. The HPCS Battery and the HPCS System were declared inoperable and the Technical Specification LCO Action statements for A.C. Sources - Operating (3.8.1.1), and ECCS Systems (3.5.1) were entered. At 1546 hours another weekly battery check surveillance was completed with the results that battery voltage was found to be within Technical Specification values. It was later discovered that a separate crew of electrical technicians, assigned to battery charging support, had discovered the low voltage condition and corrected it, prior to the check done at 1546 hours, by adjusting the HPCS Battery Charger. At 1546 hours, the HPCS Battery and the HPCS System were declared operable and the Technical Specification LCO Action statements were exited.

This incident involving inoperability of the HPCS System on September 6, 1990, was not reported by telephone to the NRC Bethesda Operations Center because it was realized that this event was not a new instance of inoperability, but a continuation of the occurrence of August 30, 1990. The discovery was made that the HPCS Battery voltage had been inadvertently reset to 0.75 VDC below the Technical Specification minimum value of 129 VDC on August 31, 1990, during the recovery from jumpering battery cell number nine. Thus, the HPCS Battery, HPCS Diesel Generator, and HPCS System had been continuously inoperable since August 30, 1990. This was, therefore, not a new instance of inoperability, but a continuation of the previous event and, as such, not a new reportable occurrence.

On September 17, 1990, at 0957 hours, in preparation for the replacement of the cracked battery cell, the HPCS System was declared inoperable and the Technical Specification LCO Action statements for ECCS Systems (3.5.1.c) and A.C. Sources - Operating (3.8.1.1.c, and 3.8.1.1.d) were entered. At 1003 hours, the 4160 VAC HPCS Emergency Power Distribution Bus (SM-4) was deenergized. After further evaluation, however, it was realized that LCO Action Statement 3.8.1.1.d. could not be met. This action statement requires that all systems, subsystems, trains, components, and devices that depend on the remaining operable diesel generators as a source of emergency power also be operable. This requirement could not be met because the A train of the Main Steam Leakage Control System (MSLC-A) was inoperable. At 1152 hours, the HPCS System was restored to operability. The NRC Bethesda Operations Center was notified of this event involving HPCS System inoperability at 1022 hours.

On September 18, 1990, at 1217 hours, in preparation for the replacement of the cracked battery cell, the HPCS System was declared inoperable and the 4160 VAC HPCS Emergency Power Distribution Bus (SM-4) was deenergized. The LCO Action Statements were entered for Electrical Power Systems A.C. Sources - Operating (3.8.1.1.c and 3.8.1.1.d), Electrical Power Systems D.C. Sources - Operating (3.8.2.1.b), ECCS Systems (3.5.1.c) and Electrical Power Systems Onsite Power Distribution Systems - Operating (3.8.3.1.a.2 and 3.8.3.1.b.2). After completion of the replacement of battery cell number nine, the HPCS System was declared operable at 1415 hours and the applicable LCO Action Statements were exited. This event was reported by telephone to the NRC Bethesda Operations Center at 1417 hours.

Immediate Corrective Action

During all four instances of HPCS System inoperability, the plant operators acted to appropriately place the plant in the condition specified by the Technical Specifications and to initiate timely action to return the HPCS System to operability.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This LER is written to document this series of events as reportable per the requirements of 10CFR50.73(a)(2)(v) as conditions " that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition"; and 10CFR50.73(a)(2)(i)(B), "Any operation or condition prohibited by the Plant's Technical Specifications". The inoperability of the HPCS system is a unique event at WNP-2. Unlike the other Emergency Core Cooling Systems, HPCS system inoperability is reportable even though all requirements of Technical Specification LCO Action Statements are being complied with. The HPCS System is a single train system that performs a safety function (e.g., high pressure injection). Because it is a "single train" Emergency Core Cooling System, a reportable conditions occurs any time it is unable to perform its safety function when it is required to be able to do so by plant conditions.

2. There were no structures, components or systems that were inoperable at the start of this event that contributed to the event.

3. The root causes of the four related instances of HPCS System inoperability (August 30, September 6, September 17, September 18) are equipment failure related and have not been completely determined as yet. The root cause effort is still in progress. The results will be reported in a supplemental LER.

B. Further Corrective Action

1. This LER will be required reading for all SRO Licensed operators and all Shift Technical Advisors (STAs) at WNP-2.

2. Written guidance will be provided by the Technical Staff Compliance group for the Operations Department concerning reportability of single train safety systems.

3. The operator requalification training program will be modified to specifically address Code of Federal Regulation single train (HPCS) operability reporting requirements and other appropriate regulatory compliance issues on an annual basis.

Safety Significance

There is no safety significance associated with this series of events. During the events, the requirements of the WNP-2 Technical Specifications were met with the single exception of the fact that HPCS Battery voltage was 0.75 volts below the minimum value for seven days. This small voltage difference is not normally able to even be read with installed meters and can only be seen when the weekly battery surveillance is performed using a portable precision meter. This small voltage difference did not represent a loss of any significance of the capability of the HPCS Battery to perform its safety function. The Technical Specification LCO actions for the involved events were correctly applied. They require ensuring the operability of the redundant ECCS Divisions 1 and 2, demonstrating the operability of the remaining Emergency Diesel Generators with periodic starts, and ensuring the operability of the Reactor Core Isolation Cooling system while the HPCS system is inoperable. The actions of the plant operators were prompt and correct to ensure the plant was maintained within the bounds of the Technical Specifications and; therefore, within the bounds of the operational safety analysis. Since no safety significance is associated with this event, it posed no threat to the health and safety of the public or plant personnel.

Similar Events

LER 90-04 documents a condition of HPCS System inoperability which occurred as a result of a failed HPCS Diesel Generator speed governor droop switch. Corrective actions consisted of installing a new droop switch.

LER 89-43 documents a condition of HPCS System inoperability which occurred as a result of the HPCS pump minimum flow control valves apparent inability to maintain sufficient flow of water through the pump when system flow was secured. Corrective actions consisted of performing a failure analysis to discover the cause of the low flow problem.

LER 89-030 documents a condition of HPCS System inoperability which occurred as a result of the failure of the Suppression Pool suction valve (HPCS-V-15) to fully open during performance of surveillance testing due to a manufacturing error associated with the motor operator. Corrective actions consisted of verification of operability of all similar design valves, revision of Plant procedures for maintenance and repair of Limitorque motor operators, revision of Plant procedures regarding valves found to be difficult to operate, and notification of Limitorque of a 10CFR21 report.

LER 85-22 documents a condition of HPCS System inoperability which occurred as a result of repair efforts for two HPCS initiation status lamps causing inoperability of the HPCS initiation logic. Corrective actions consisted of notification of all Plant Operators and Maintenance and Technical personnel that elementary drawings should be used for general information purposes only and not for troubleshooting.

EIIS Information

Text Reference	EIIS Reference	
	System	Component
High Pressure Core Spray System (HPCS)	BG	---
125 VDC Battery cell	EJ	BTRY
HPCS Battery	BG	BTRY
Emergency Core Cooling Systems	---	---
HPCS DG	EK	DG
DO-LS-21	DC	LIS
DO-TK-3C	DC	TK
HPCS Battery Charger	BG	BYC
SM-4	EA	BU
MSLC-A System	SB	---
HPCS Pump minimum flow control valve	BG	FCV
Suppression pool suction valves	NH	V