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SUBJECT: LER 92-044-00:on 921208,HPCS sys pump suction valve switchover occurred,due to spurious actuation of either one or both CST pipe break detectors.Engineering will evaluate replacement of detectors & alternate design.W/930106 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

January 6, 1993
G02-93-004

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. 92-044

Transmitted herewith is Licensee Event Report No. 92-044 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR 50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Sincerely,

J. W. Baker
WNP-2 Plant Manager (Mail Drop 927M)

JWB/CDM/cgeh
Enclosure

cc: Mr. J. B. Martin, NRC - Region V
Mr. R. Barr, NRC Resident Inspector (Mail Drop 901A, 2 Copies)
INPO Records Center - Atlanta, GA
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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)
HIGH PRESSURE CORE SPRAY (HPCS) SYSTEM PUMP SUCTION VALVE AUTOMATIC SWITCHOVER ACTUATION

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)
1 2	0 8	9 2	9 2	-- 0 4 4	-- 0 0	1 2	3 0	9 2		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)			
1	20.402(b)	20.405(C)	X 50.73(a)(2)(iv)	77.71(b)
POWER LEVEL (10)	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.73(c)
1 0 0	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
C. D. Mackaman, Compliance Engineer	AREA CODE 5 0 9 3 7 7 - 4 1 5 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	

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

ABSTRACT (16)

At 00:41 on December 8, 1992, with the Plant operating at 100% power, a High Pressure Core Spray (HPCS) System pump suction valve switchover occurred. The switchover actuation consists of the automatic closure of Condensate Storage Tank Suction Valve HPCS-V-1, and the opening of Suppression Pool Suction Valve HPCS-V-15.

At the time of the suction valve switchover, the Plant Control Room Operators received a momentary "HPCS SUCTION SWITCHOVER CST LEVEL LOW" annunciator. The closure of HPCS-V-1 and opening of HPCS-V-15 was by Plant design. After verifying that no actual high Suppression Pool or low Condensate Storage Tank Level condition existed, the Plant Control Room Operators restored the system to the pre-event line-up as an immediate corrective action at 01:12.

The root cause of this event is indeterminate. However, it is suspected that the cause was the spurious actuation of either one or both Condensate Storage Tank pipe break detectors (HPCS-LS-3A/3B). The detectors were found with excessive setpoint drift, and may be susceptible to radio frequency interference (RFI). As corrective actions, the interval for calibration of HPCS-LS-3A/3B will be reduced from 18 months to one month to limit the setpoint drift. In addition, Engineering will evaluate replacement of the existing detectors with an alternative design to eliminate the setpoint drift. Maintenance will investigate the susceptibility of the detectors to RFI.

This event posed no threat to the health and safety of either the public or Plant personnel.

Plant Conditions

Power Level - 100%
Plant Mode - 1 (Power)

Event Description

At 00:41 on December 8, 1992, with the Plant operating in Mode 1 at 100% power, a High Pressure Core Spray (HPCS) System pump suction valve switchover occurred. The Plant configuration at the time was such that the HPCS pump suction was lined up to the Condensate Storage Tanks, with suction valve HPCS-V-1 open (the normal line-up) and Suppression Pool Suction Valve HPCS-V-15 closed. The switchover actuation was the automatic closure of HPCS-V-1 and the opening of HPCS-V-15.

At the time of the suction valve switchover, a momentary "HPCS SUCTION SWITCHOVER CST LEVEL LOW" alarm was received by the Plant Control Room Operators. The alarm duration was very brief and cleared immediately, with no operator action. Although the switchover was unexpected, the closure of HPCS-V-1 and the opening of HPCS-V-15 was by Plant design. Initial investigation by the Operations crew was to validate the alarm. Review of the computer data for the Condensate Storage Tank and Suppression Pool levels indicated that both levels were within their acceptable bands, with no apparent level perturbations or trends. The Control Room Supervisor then dispatched an Equipment Operator to the level switches to determine the cause of the alarm. The Equipment Operator could not find any abnormal conditions, nor did there appear to be any ongoing maintenance or other activities in the area.

With the Condensate Storage Tank and Suppression Pool levels verified within their acceptable bands, the Plant Control Room Operators restored the HPCS system to the pre-event line-up (HPCS-V-15 was closed and HPCS-V-1 was re-opened) at 01:12.

In accordance with 10CFR 50.72(b)(2)(ii), this event was reported as an unplanned automatic ESF actuation to the NRC Operations Center via the Emergency Notification System at 01:26 on December 8, 1992.

Immediate Corrective Actions

Plant Control Room Operators realigned the HPCS pump suction valves to the normal pre-event line-up.

Further Evaluation and Corrective Action

Further Evaluation

This event is reportable under 10CFR 50.73(a)(2)(iv) as an event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature.

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

The "HPCS SUCTION SWITCHOVER CST LEVEL LOW" alarm and associated HPCS pump suction valve switchover circuitry are actuated by two Condensate Storage Tank low level switches (HPCS-LS-1A/1B) and two pipe break detectors (HPCS-LS-3A/3B) arranged in a one-out-of-one logic. The input from level switches HPCS-LS-1A/1B comes from two Magnetrol float switches, and the input from pipe break detectors HPCS-LS-3A/3B comes from two Fluid Components Incorporated (FCI) solid state electronic fluid flow detectors.

Post event calibration of HPCS-LS-1A/1B and HPCS-LS-3A/3B found HPCS-LS-1A & 1B to be within their normal calibration trip setpoint tolerances, requiring no adjustments. However, both HPCS-LS-3A & 3B were found to have drifted out of their normal calibration trip setpoint tolerances, requiring adjustments. HPCS-LS-3A had drifted +33.75% (toward the trip setpoint) and HPCS-LS-3B had drifted -46.25% (away from the trip setpoint). The normal calibration tolerance is +0/-12.5%. The trip setpoint drift of +33.75% meant that only a 53 millivolt signal would be required to cause HPCS-LS-3A to trip. This fact, and previous experience with field located solid state electronic components, prompted investigators to suspect that the actual mechanism for the spurious actuation was a lower than normal trip setpoint, in conjunction with RFI from a portable radio transmission in the area of the FCI detectors. Although no one was found in the area with a radio during the initial investigation by Operations, the susceptibility of the detectors to RFI will be further investigated. A supplemental LER will be submitted if the investigation provides conclusive evidence that RFI was the root cause.

A historical search was conducted to determine setpoint drift values for HPCS-LS-3A/3B during calibration intervals preceding this event. The only data available was for the intervals from the setpoint change calibration on September 8, 1991 to April 7, 1992, and April 7, 1992 to the post event calibration of December 8, 1992. Prior to this time PPM 10.27.23 did not require the "as found" data to be recorded. During the first seven month period, HPCS-LS-3A had drifted +11.25% and HPCS-LS-3B had drifted +68.75%, and during the subsequent eight month period, HPCS-LS-3A had drifted +33.25% and HPCS-LS-3B had drifted -46.25%. From this data it was concluded that the excessive setpoint drift is a recurring problem that should be resolved by Engineering, and the normal calibration interval of 18 months should be shortened to one month to limit the setpoint drift. The calibration interval may be extended after three months based upon evaluation of the monthly setpoint drift values.

The Root Cause for this event is indeterminate since a formal root cause analysis failed to provide a conclusive root cause for the HPCS pump suction valve switchover actuation.

Further Corrective Action

1. Reduce the interval for calibration of HPCS-LS-3A/3B from 18 months to one month. This will be completed by January 31, 1993. After three months at the monthly interval, Technical Staff will evaluate increasing the interval to six months.

2. Expedite evaluation of Technical Evaluation Request (TER) No. 92-0290, that recommended replacement of HPCS-LS-3A/3B with an alternative design to provide a more reliable and repeatable response time of less than or equal to one (1) second. The TER evaluation will be completed by February 28, 1993.

3. Maintenance will investigate the susceptibility of the FCI pipe break detectors to RFI from portable radio transmissions under MWR No. AP1526. This will be completed by January 31, 1993.

4. Amend the Root Cause Analysis and submit a supplemental LER if the Maintenance investigation provides conclusive evidence that RFI was the root cause. This will be completed by February 28, 1993.

Safety Significance

There is no safety significance associated with this event, as there was no actual Condensate Storage Tank or Suppression Pool level change. The HPCS system pump suction valve switchover operated as designed, with the safety function being continuously satisfied by either the Condensate Storage Tanks or the Suppression Pool as a water source. Accordingly, this event posed no threat to the health and safety of either the public or Plant personnel.

Similar Events

LER 90-011, "High Pressure Core Spray (HPCS) System Pump Suction Valve Switchover Actuation - Cause Unknown." The cause of this event was indeterminate, attributed to an apparent spurious transient. The Suppression Pool level switches, and Condensate Storage Tank level switches and pipe break detectors were calibrated and returned to service with no further corrective action identified.

EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
High Pressure Core Spray (HPCS)	BG	---
HPCS-V-1	BG	V
Suppression Pool	NH	---
Condensate Storage Tank	KA	TK
HPCS-LS-1A	BG	LIS
HPCS-LS-1B	BG	LIS
HPCS-LS-3A	BG	MS
HPCS-LS-3B	BG	MS