

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Washington Nuclear Plant - Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 1 9 7										PAGE (3) 1 OF 0 4			
TITLE (4) Reactor Protection System Low Level Actuation During Shutdown Cooling System Lineup Change - Personnel Error/Inadequate Design																							
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	1	8	8	8	8	0	1	1	0	0	0	5	3	1	8	8	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(c)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)									
		20.405(a)(1)(i)				50.36(c)(1)				<input type="checkbox"/> 50.73(a)(2)(v)				73.71(c)									
		20.405(a)(1)(ii)				50.36(c)(2)				<input type="checkbox"/> 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)				<input type="checkbox"/> 50.73(a)(2)(viii)(A)													
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				<input type="checkbox"/> 50.73(a)(2)(viii)(B)													
		20.405(a)(1)(v)				50.73(a)(2)(iii)				<input type="checkbox"/> 50.73(a)(2)(x)													
LICENSEE CONTACT FOR THIS LER (12)																							
NAME W.S. Davison, Compliance Engineer														TELEPHONE NUMBER AREA CODE 5 1 0 1 9 3 7 1 7 1 - 2 1 5 1 0 1									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																							
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPDs		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPDs													
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)

At 1840 hours on May 1, 1988, a Reactor Protection System (RPS) actuation occurred as a result of a Reactor Pressure Vessel (RPV) low water level of +13 inches. During a routine shift of the Residual Heat Removal (RHR) Shutdown Cooling (SDC) system lineup, both the RHR SDC Loop "B" suction and the Suppression Pool suction were inadvertently open at the same time which established an uncontrolled drain path from the RPV to the Suppression Pool. This allowed approximately 10,000 gallons of water to drain from the RPV until automatic closure of the RHR SDC isolation valves terminated the low RPV level excursion at -19 inches. Plant operators took prompt action to restore RPV level to greater than +13 inches at 1847 hours using the Control Rod Drive and Condensate Systems. The causes were determined to be personnel error and insufficient depth of design in that previous procedure precautions and administrative controls were believed adequate and, consequently, no interlock was installed to prevent the two suction valves from being open at the same time in this sequence. Corrective actions include 1) counseling the individual involved, and 2) providing an interlock to prevent the opening of the Suppression Pool suction valve with the associated RHR SDC suction valve open.

All automatic safety system responses occurred as designed and operator actions to recover RPV level were prompt and correct. The primary safety concern during shutdown conditions is the potential for uncovering of the fuel. The top of active fuel is located at -161 inches. Since the level transient was terminated at -19 inches, more than adequate vessel water inventory remained to assure fuel coverage. This event posed no threat to the safety of Plant personnel or the public.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Plant Conditions

- a) Power Level - 0%
- b) Plant Mode - 4 (Cold Shutdown)

Event Description

At 1840 hours on May 1, 1988, a Reactor Protection System (RPS) actuation occurred as a result of a Reactor Pressure Vessel (RPV) low water level. Approximately 10,000 gallons of RPV water inventory was inadvertently drained to the Suppression Pool during a routine shift of Shutdown Cooling (SDC) from Residual Heat Removal (RHR) Loop "B" to Loop "A".

Initial conditions prior to the event were; Reactor Plant in Cold Shutdown Mode 4, depressurized, temperature control band 140°F to 160°F. RHR pump 1B (RHR-P-1B) was operating in shutdown cooling and RHR-P-1A was in standby (lined up for Emergency Core Cooling System [ECCS] actuation). Reactor Recirculation pump 1A (RRC-P-1A) was operating at 15 Hz and RRC-P-1B was secured.

At 1839 hours, after reviewing the operating procedure, the Control Room Operator (CRO) secured RHR-P-1B and closed the Reactor suction valve RHR-V-6B. Prior to RHR-V-6B stroking completely closed, the CRO opened the Suppression Pool suction valve (RHR-V-4B) to place RHR-P-1B in standby ECCS lineup. These two valves both have stroke times in the range of 120 seconds. Consequently, for approximately 40 seconds, both the Reactor suction and the Suppression pool suction were open, allowing approximately 10,000 gallons of water to gravity drain from the RPV to the Suppression Pool via the RHR suction lines until the RHR SDC isolation valves (RHR-V-8 and 9) automatically closed. At 1840 hours 7 seconds, RPV level reached +13 inches resulting in an automatic Low RPV Level RPS actuation and automatic isolation of the RHR Reactor suction isolation valves RHR-V-8 and RHR-V-9. The closure of the Reactor suction isolation valves terminated the RPV Low Level transient at 1840 hours 42 seconds. The lowest RPV level reached was -19 inches.

Immediate Corrective Action

The CRO took immediate action to stop the water loss by closing RHR-V-8 and RHR-V-9, however, these valves were already closing from the automatic isolation signals at RPV Level-3. Plant Procedures were then followed to restore RPV water level, resulting in +13 inches being regained at 1847 hours using the Control Rod Drive (CRD) and Condensate Systems. Operator recovery action was prompt and correct.

Further Evaluation

1. The causes of this event are personnel error and insufficient depth of design. The CRO failed to recognize the actual Plant condition (i.e., that Reactor suction valve RHR-V-6B was not fully closed prior to opening Suppression Pool suction valve RHR-V-4B), contrary to the approved operating procedure for the system which provided precaution notes to prevent these valves from being open simultaneously, and contrary to a "permanent operator aid" caution label on the control panel.

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

The potential for this drain path to exist was recognized as a result of a previous event (LER 85-30), and corrective actions implemented consisted of adding precautions to the operating procedure and installation of a red plastic caution label on the control board adjacent to the RHR-V-4A and RHR-V-4B operating switches. It was believed at that time that those corrective actions were sufficient such that no interlock was designed to prevent the Reactor and Suppression Pool suction valves from being open at the same time in this sequence to inadvertently drain the Reactor Pressure vessel.

However, as a result of Operations performance expectations not being met and an increased sensitivity in the area of root cause analysis, it is now recognized that an interlock in the system is necessary to prevent this event from recurring.

2. The following actions occurred as designed upon reaching RPV Level-3 (+13 inches):

- RPV Low Level-3 RPS actuation - the only actual operation of components that occurred were logic relay actuation and repositioning of control valves for the reactor scram function of the CRD System. No control rods were actually repositioned since they had been previously inserted fully into the core.
- Nuclear Steam Supply Shutoff System (NS4) Groups 5 and 6 received an isolation signal. The only valves which were not in their isolation position functioned correctly to close (i.e., RHR-V-8 and RHR-V-9).
- Reactor Recirculation pumps received a signal to transfer to 15 Hz operation. This shift did not occur as neither pump was operating from the 60 Hz power supply.
- A Low RPV Level-3 Confirmation Signal was generated for the Automatic Depressurization System.

Further Corrective Action

1. The Control Room Operator involved in this event was counseled.
2. An interim corrective action was taken to deviate the RHR system operating procedure to require that RHR-V-4A(B) be de-energized, and caution-tagged closed whenever the applicable RHR pump is in the Shutdown Cooling mode.
3. A design change is in the process of being implemented which removes the seal-in feature from RHR-V-4A and 4B open control circuit, and adds an interlock between RHR-V-6A/B and RHR-V-4A/B to eliminate concurrent cycling of the valves.
4. Plant procedures were revised to require independent signoffs during Alternate and Remote Shutdown Panel testing of RHR-V-4 and RHR-V-6.

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

Safety Significance

All automatic safety system responses occurred as designed and operator actions to recover RPV level were prompt and correct. The primary safety concern during shutdown conditions is the potential for uncovering of the fuel. The top of active fuel is located at -161 inches. Since the level transient was terminated at -19 inches, more than adequate vessel water inventory remained to assure fuel coverage. This event posed no threat to the safety of Plant personnel or the public.

Similar Events

LER 85-30

EIIS InformationText ReferenceEIIS Reference

	System	Component
Reactor Protection System (RPS)	JC	- - - - -
Residual Heat Removal (RHR) System	BO	- - - - -
RHR-P-1A/1B	BO	P
RRC-P-1A	AD	P
RHR-V-6B	BO	ISV
RHR-V-4B	BO	ISV
RHR-V-8/9	BO	ISV
Control Rod Drive (CRD) System	AA	- - - - -
Condensate System	SD	- - - - -
Nuclear Steam Supply Shutoff System (NS ⁴)	BD	- - - - -
Automatic Depressurization System (ADS)	SB	- - - - -

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

Docket No. 50-397

May 31, 1988

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 88-011

Dear Sir:

Transmitted herewith is Licensee Event Report No. 88-011 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,



C.M. Powers (M/D 927M)
WNP-2 Plant Manager

CMP:lg

Enclosure:
Licensee Event Report No. 88-011

cc: Mr. John B. Martin, NRC - Region V
Mr. C.J. Bosted, NRC Site (M/D 901A)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI
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