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 BAKER, J.W.    Washington Public Power Supply System  
 RECIP. NAME    RECIPIENT AFFILIATION

SUBJECT: LER 92-032-00: on 920702, unplanned ESF actuation occurred due to decrease in reactor water level resulting from voided feedwater piping. Cause under investigation. Corrective actions will be reported in supplemental LER.W/920803 ltr.

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August 3, 1992  
60-92-185

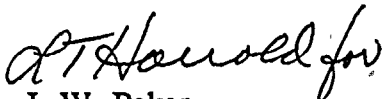
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**SUBJECT: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21  
LICENSEE EVENT REPORT NO. 92-032**

Transmitted herewith is Licensee Event Report No. 92-032 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.

Sincerely,



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

JWB/RJP/cgeh  
Enclosure

cc: Mr. J. B. Martin, NRC - Region V  
Mr. C. Sorensen, NRC Resident Inspector (Mail Drop 901A, 2 Copies)  
INPO Records Center - Atlanta, GA  
Mr. D. L. Williams, BPA (Mail Drop 399)

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# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Washington Nuclear Plant - Unit 2</b>	DOCKET NUMBER (2) 0   5   0   0   0   3   9   7	PAGE (3) 1   OF   6
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TITLE (4)  
**UNPLANNED MANUAL ESF ACTUATION DUE TO DECREASE IN REACTOR WATER LEVEL  
 RESULTING FROM VOIDED FEEDWATER PIPING**

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	7	02	92	032	00	0	8	03		05000	

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)	77.71(b)	
	20.405(a)(1)(i)	50.36(c)(1)	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 <b>M. P. Reis, Compliance Engineer</b>	TELEPHONE NUMBER 5   0   9   3   7   7   -   4   1   5   2

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) <input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH   DAY   YEAR 08   31   92
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ABSTRACT (16)

At approximately 1317 hours on July 2, 1992, with the plant in Cold Shutdown, reactor vessel water level decreased from normal operating range to approximately +18" when approximately 3400 gallons of water drained from the reactor vessel into a voided section of Feedwater System piping. This condition was initiated when a feedwater system valve was opened to perform maintenance. In response, control rod drive cooling flow to the vessel was increased, and Reactor Water Cleanup letdown flow was isolated. Vessel water level was recovered and stabilized following manual ESF initiation of injection from the Residual Heat Removal System and closure of RFW-V-65A.

The root cause of this event is currently under investigation. Corrective actions and the results of this root cause analysis will be reported in a supplemental LER. Submittal of this supplement is scheduled for August 31, 1992. The event was not safety significant, and did not involve failure of a plant component or system.

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		Year 92	Number 032	Rev. No. 00			
TITLE (4) UNPLANNED MANUAL ESF ACTUATION DUE TO DECREASE IN REACTOR WATER LEVEL RESULTING FROM VOIDED FEEDWATER PIPING					2	OF	6

### Plant Conditions

Power Level - 0%

Plant Mode - 4.

### Event Description

At approximately 1317 hours on July 2, 1992, Residual Heat Removal (RHR) pump RHR-P-2A was manually started in response to a decreasing reactor water level condition. This event is considered to be a challenge to an ESF component because RHR-P-2A was used to in a manner consistent with its intended ESF function as a Low Pressure Coolant Injection (LPCI) pump.

Prior to starting the pump, an annunciator indicating high differential flow in the Reactor Water Cleanup (RWCU) System was received in the Main Control Room at 1312 hours. Control Room operators recognized that reactor vessel water level was decreasing immediately after this annunciator was received. Receipt of the RWCU high differential flow annunciator and the coincident decrease in reactor vessel level were also immediately recognized to correspond with opening of valve RFW-V-65A.

RFW-V-65A is a 24" motor operated valve located at the inlet to the reactor pressure vessel for Main Feedwater Line "A" (see attached sketch). RFW-V-65A was in the process of being opened manually in order to support packing ring maintenance when the RWCU high differential flow annunciator was received. Electrical power to the motor operator had been tagged out under a clearance order in order to support maintenance activities.

Operators immediately responded to the decreasing vessel water level condition by increasing control rod drive (CRD) cooling flow from the CRD pumps. Concurrently, efforts were initiated to contact personnel working on RHR-V-65A in order to effect closure of this valve, and RWCU letdown flow was isolated in order to limit further inventory loss. The inventory loss, which was approximately 400 gpm, exceeded CRD pump cooling flow and vessel water level continued to decrease.

RHR pump RHR-P-2A was started at 1317 hours in preparation for injection from the suppression pool, and controlled injection was initiated at 1319 hours. Reactor vessel water level had dropped to approximately +18" by this time, but increased immediately following initiation of injection to between +30" and +45". Electrical power to the motor operator for valve RHR-V-65A was restored at 1324 hours, and the valve was subsequently closed from the Main Control Room.

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Reactor vessel water level was stabilized at +38" at 1324 hours. Injection from RHR-P-2A was secured at 1325 hours, and RHR-P-2A was returned to operation in the shutdown cooling mode. Suppression pool level, which had decreased to -0.73" during the event, was recovered to +0.2". CRD cooling flow and RWCU letdown flow were returned to normal values.

In accordance with 10CFR50.72(b)(2)(ii), this event was reported as an unplanned, manual ESF actuation to the NRC Operations Center via the Emergency Notification System at 1450 hours.

#### Immediate Corrective Actions

As an immediate corrective action, reactor vessel water level was restored within normal operating parameters.

#### Further Evaluation and Corrective Action

##### Further Evaluation

This event is considered reportable under 10CFR50.73(a)(2)(iv) as an unplanned manual actuation of an ESF component. RHR pump RHR-P-2A was started manually from the Main Control Room during this event, but did not receive an initiation signal from either the manual or automatic ESF actuation logic. This event is considered to be reportable as a challenge to an ESF component because the pump was used to in a manner that would normally be associated with its intended ESF design function.

An Incident Review Board was convened to investigate the cause of this event. The Board concluded that vessel water loss most probably resulted when flow from an RWCU return line that is connected to Main Feedwater System line "A" was drained into a voided section of feedwater piping. This conclusion is supported by the rate of vessel water loss, which coincides with the approximately 400 gpm flow rate for the RWCU system, plant evolutions that were in progress at the time the event was initiated, and observed irregularities associated with vessel water level when opening RFW-V-65A during a previous shift.

Unexpected, small reactor water level increases had been noted when RFW-V-65A was opened during the previous control room shift. Although boundary valves located upstream of RFW-V-65A (RFW-V-112A, RFW-V-112B, RFW-V-109) had been closed, inflow from the Condensate System was causing vessel water level to increase when RFW-V-65A was operated. In response to this situation, the boundary for work being performed on RFW-V-65A was extended back to valves located further upstream, on the suction side of the feedwater pumps (COND-V-146A, COND-V-146B, COND-V-144).

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Information regarding the observed vessel level increases was communicated to the next shift of control room operators. However, an opportunity to identify that valve position indication for RFW-V-109 was incorrect was missed when further investigation of this condition was not pursued.

With the plant in the configuration previously described, water trapped between RFW-V-65A and boundary valves located on the suction side of the feedwater pumps was able to drain past the feedwater pump seals via RFW-V-109 and the feedwater pump discharge check valves (RFW-V-101A, and RFW-V-101B), and into the condensate system.

Since the boundary for RFW-V-65A was moved approximately thirteen hours prior to initiation of this event, and the four feedwater pump seals each draw approximately three gpm, the voided section of piping behind RFW-V-65A valve could have held as much as 4680 gallons. This is greater than the approximately 3400 gallons of water that was added during recovery from this event.

The root cause of this event is currently under investigation and will be reported in a supplemental LER.

The condition described in this report did not involve any structures, components, or systems that were inoperable at the start of the event, nor did it involve failure of a plant component or system.

#### Further Corrective Action

Corrective actions and the results of the root cause analysis will be reported in a supplemental LER. Submittal of this supplement is scheduled for August 31, 1992.

#### Safety Significance

Personnel actions and safety system and component response were appropriate during recovery from this event. The reactor vessel level transient was terminated above the automatic initiation setpoints for RPS and ESF protective features. Consequently, this event was not safety significant since more than adequate reactor coolant inventory was available at all times to assure fuel coverage and core cooling capability. However, even if the reactor vessel water level decrease had been more significant, availability of ESF safety functions such as RWCU isolation, Low Pressure Core Spray (LPCS), and the Low Pressure Coolant Injection (LPCI) mode of Residual Heat Removal (RHR) System operation would have been adequate to ensure the safety of the plant and public.

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### Similar Events

Previous events involving a decrease in reactor vessel water level due to reactor coolant drainage during plant shutdown have been reported in LERs 84-090, 84-091, 85-030, 86-038, and 88-011. None of these events involved reactor coolant loss into voided piping resulting from valve leakage or reliance on incorrect valve position indication.

### EIIS Information

#### Text Reference

Condensate System/Valves  
Control Rod Drive (CRD) System/Pump  
Engineered Safety Features (ESF) System  
Main Feedwater System/Pump Seal, Valve  
  
High Pressure Coolant Injection (HPCI)  
System  
High Pressure Core Spray (HPCS)  
System/Pump  
Low Pressure Coolant Injection (LPCI)  
Low Pressure Core Spray (LPCS) System  
Main Control Room  
Reactor Protection System (RPS)  
Reactor Water Cleanup (RWCU) System  
Residual Heat Removal (RHR) System  
RFW-V-65A, RFW-V-109

#### EIIS Reference

<u>System</u>	<u>Component</u>
SD	V, FCV
AA	P
JE	--
SJ	P, SEAL, V, FCV
BJ	--
BG	P
BO	--
NA	--
JC	--
CE	--
BO	--
SJ	V, FCV

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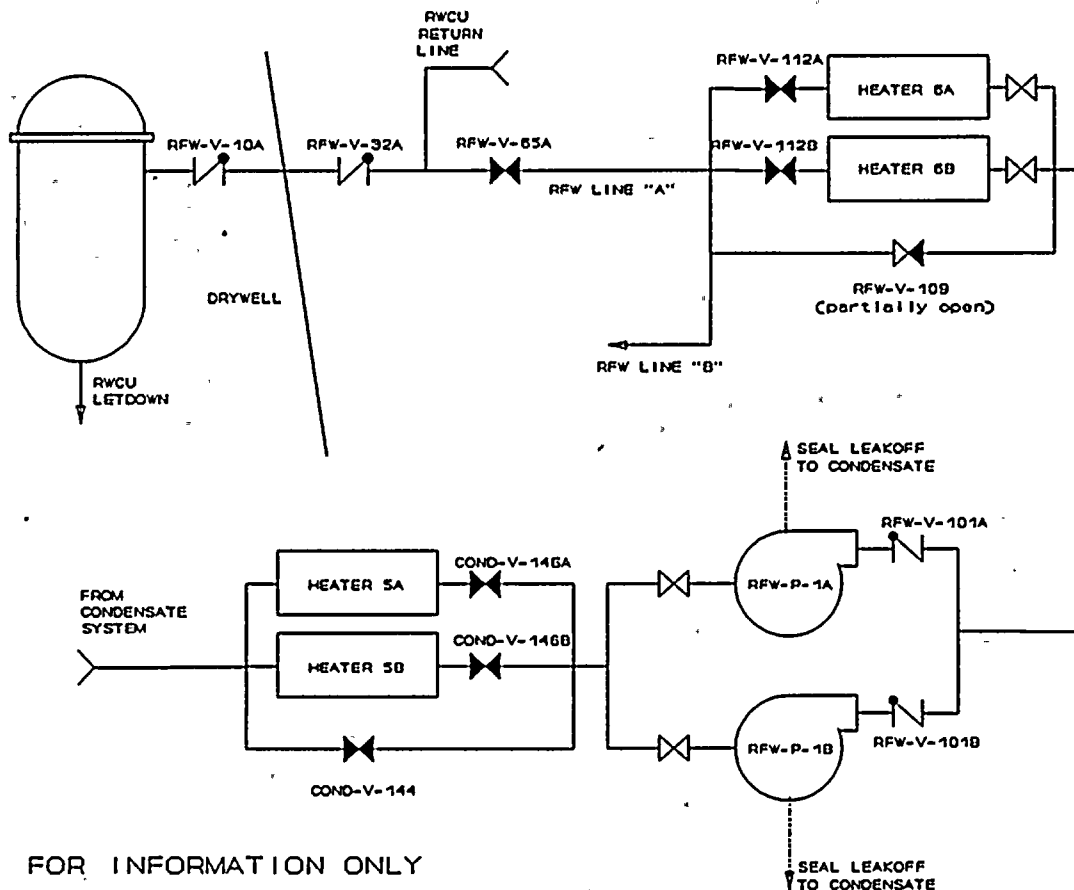
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TITLE (4)

UNPLANNED MANUAL ESF ACTUATION DUE TO DECREASE IN REACTOR WATER LEVEL RESULTING FROM VOIDED FEEDWATER PIPING



FOR INFORMATION ONLY

Feedwater System Valve Lineup