

# ENERGY NORTHWEST

P.O. Box 968 ■ Richland, Washington 99352-0968

March 2, 2000  
GO2-00-042

Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21,  
LICENSEE EVENT REPORT NO. 2000-002-00**

Transmitted herewith is Licensee Event Report No. 2000-002-00 for WNP-2. This report is submitted pursuant to 10 CFR 50.73. The enclosed report discusses items of reportability and corrective action taken.

Should you have any questions or desire additional information regarding this matter, please call me or Mr. PJ Inserra at (509) 377-4147.

Respectfully,



RL Webring  
Vice President, Operations Support/PIO  
Mail Drop PE08

Attachment

cc: EW Merschhoff - NRC-RIV  
JS Cushing - NRC-NRR  
INPO Records Center  
NRC Sr. Resident Inspector - 927N (2)  
DL Williams - BPA/1399  
TC Poindexter - Winston & Strawn

JE22

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1) <p align="center"><b>WNP-2</b></p>	DOCKET NUMBER (2) <p align="center"><b>50-397</b></p>	PAGE (3) <p align="center"><b>1 OF 3</b></p>
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TITLE (4)  
**Potential for a Water Hammer Condition in Reactor Core Isolation Cooling System**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	02	2000	2000	002	00	3	2	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL	100%	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)		
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER		
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)				
		20.405(a)(1)(iv)		X 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 R. E. Brownlee, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (509) 377-2085
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED	MONTH	DAY	YEAR
<input checked="" type="checkbox"/>	YES (If yes, completed EXPECTED SUBMISSION DATE).				07	31	2000

**ABSTRACT:**

On February 2, 2000 at 1134 hours, with the plant in Mode 1 at 100% power, it was determined that the plant was in a condition that was outside of the design basis. During accident or transient scenarios, or Appendix R fire scenarios which may require the Reactor Core Isolation Cooling (RCIC) System to cycle on and off to maintain reactor vessel water level, restart of the RCIC System in conjunction with a failure of the water leg or "keep-fill" pump (RCIC-P-3) could create a water hammer in RCIC System piping. The potential water hammer might jeopardize the integrity of the reactor coolant pressure boundary or primary containment isolation barriers associated with the RCIC System, as well as result in the potential loss of safe shutdown equipment from pipe whip, jets, and flooding.

Immediate corrective actions included the performance of an assessment that concluded that the RCIC System, reactor coolant pressure boundary, safe shutdown systems, and primary containment integrity were operable but non-conforming to "single failure" design criteria. Furthermore, to eliminate the possibility of water hammer, plant operating procedures have been revised to inhibit RCIC System operation during accident or transient scenarios if a loss of RCIC water leg pump is identified, or if a RCIC water leg pump low discharge pressure condition exists.

The cause of this event is yet to be determined, but appears to be associated with the original design of the plant. This issue is being addressed by the General Electric (GE) Company and discussed with the BWR Owners Group (BWROG).

**LICENSEE EVENT REPORT (LER)**

**Potential for Water Hammer Condition in Reactor Core Isolation Cooling System**

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		00	002	00	

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

ABSTRACT (CONTINUED):

Pending further information from GE and the BWROG, it is presently concluded that there are minimal safety consequences associated with this event. As previously stated, the RCIC System, reactor coolant pressure boundary, safe shutdown systems, and primary containment integrity were assessed to be operable but non-conforming to "single failure" design criteria.

This event was previously reported on February 2, 2000 as a 1-hour non-emergency report in accordance with 10CFR50.72(b)(1)(ii)(B).

A supplement to this Licensee Event Report will be issued in order to update the staff on the cause of this event and on any necessary additional corrective actions determined to be necessary.

Event Description

On February 2, 2000 at 1134 hours, with the plant in Mode 1 at 100% power, it was determined that the plant was in a condition that was outside of the design basis. The Reactor Core Isolation Cooling (RCIC) System [BN] is equipped with a water leg or "keep-fill" pump which is designed to maintain the RCIC System full of water at all times to prevent water-hammer. However, the RCIC water leg pump is not single failure proof. During accident or transient scenarios, or Appendix R fire scenarios which may require the RCIC System to cycle on and off to maintain reactor vessel water level, restart of the RCIC System in conjunction with a failure of the water leg pump, or low water leg pump discharge pressure, could create a water hammer in the RCIC piping system. The potential water hammer might jeopardize the integrity of the reactor coolant pressure boundary or primary containment isolation barriers associated with the RCIC System, as well as result in the potential loss of safe shutdown equipment from pipe whip, jets, and flooding.

Immediate Corrective Action

Immediate corrective actions included the performance of an assessment that concluded the RCIC System, reactor coolant pressure boundary, safe shutdown systems, and primary containment integrity were operable but non-conforming to "single failure" design criteria. In addition, discussions were initiated with subject experts at GE on the generic implications of this issue, and the issue is being discussed with the BWROG. Furthermore, to eliminate the possibility of water hammer, plant operating procedures have been revised to inhibit RCIC System operation during accident or transient scenarios if a loss of RCIC water leg pump is identified, or if a RCIC water leg pump low discharge pressure condition exists. Fire tours have also been initiated to ensure a fire does not render the RCIC water leg pump inoperable should the RCIC System be used for plant safe shutdown.

Further Evaluation

The existing RCIC System is designed to automatically start if reactor water level decreases to the low level signal setpoint (Level 2) and automatically stop at the high water level signal setpoint (Level 8). If the reactor water level again decreases to low level signal setpoint, the RCIC System will restart. When RCIC first initiates, a lube oil cooling valve (RCIC-V-46) automatically opens but does not receive a signal to close when RCIC automatically stops. The open valve provides a drain

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path that will depressurize the system. The restart of the RCIC System on reaching Level 2 in conjunction with a postulated failure of the water leg pump could create a water hammer in the RCIC piping system. The water hammer could jeopardize the integrity of the reactor coolant pressure boundary or primary containment, cause flooding, or result in the inability to safely shutdown during accident/transient scenarios or during an Appendix R fire.

The original RCIC System design did not include automatic restart after trip at high water level (Level 8). At the Level 8 trip, the RCIC System was tripped and required local reset of the turbine steam inlet control valve before restart could occur. This original design was revised in 1982 following BWROG/GE design change recommendations as a result of the Three Mile Island incident.

Root Cause

The cause of this event is yet to be determined, but appears to be associated with the original design of the plant. A supplement to this Licensee Event Report will be issued in order to update the staff on the cause of this event.

Further Corrective Action

Further corrective actions will be developed after obtaining the results of a review of this issue by GE and the BWROG. Specific information regarding further corrective actions will be provided to the staff in a supplement to this LER.

Assessment of Safety Consequences

Pending further information from GE and the BWROG, it is presently concluded that there are minimal safety consequences associated with this event. The RCIC System, reactor coolant pressure boundary, safe shutdown systems, and primary containment integrity are operable but non-conforming to "single failure" design criteria. Plant operating procedures have been revised to inhibit RCIC System operation during accident or transient scenarios if a loss of RCIC water leg pump is identified, or if a RCIC water leg pump low discharge pressure condition exists. Operators have been trained on the revised procedures. In addition, because the RCIC water leg pump is not protected from the effects of fire, compensatory actions consisting of hourly fire tours are now in place. Lastly, the water leg pump is considered reliable, as it is supplied with safety-related power, and receives a high level of monitoring and preventative maintenance.

Similar Events

There have been no previous similar events at WNP-2.