ENERGY NORTHWEST

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

March 1, 2000
GO2-00-041

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. 2000-001-00

Transmitted herewith is Licensee Event Report No. 2000-001-00 for WNP-2. This report is submitted pursuant to 10 CFR 50.73 and is the follow-up to Event Report Number 33651. The enclosed report discusses items of reportability, corrective action taken, and action to preclude recurrence.

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

Respectfully,

GO Smith
VP Generation/Plant General Manager
Mail Drop 927M

Attachment

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

IE22

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
WNP-2	50-397	1 OF 4

TITLE (4)

Condition that could have allowed fulfillment of a safety function beyond the Technical Specifications allowable limit

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	01	2000	2000	001	00	03	01	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE	1
POWER LEVEL	100

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)
	20.405(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v)(c)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)(B)		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 (Include Area Code)
F. A. Schill, Licensing Technical Specialist	(509) 377-2269

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
	YES (If yes, completed EXPECTED SUBMISSION DATE).	X NO				

ABSTRACT:

On February 1, 2000 with the plant in mode 1 at 100% power it was determined that the Main Steam Isolation Valves (MSIVs) [JM] would not have closed automatically in response to a condenser low vacuum condition within the value allowed by the Technical Specifications. This condition was discovered after performance of a channel functional test of main condenser vacuum-low instrumentation that functions to generate a signal to close the MSIVs. The setpoints for two pressure switches that monitor condenser vacuum were found to be out of tolerance in a non-conservative direction that exceeded the Technical Specifications allowable value of greater than or equal to 7.2 inches of mercury (Hg) vacuum. A review of the condition determined that the switches had been misadjusted during a previous calibration on November 10, 1999 and had remained out of tolerance since that time. Upon discovery of this condition, the pressure switches were adjusted to the nominal setpoint and the automatic MSIV closure on low condenser vacuum function was restored to actuate at the required value. This condition would have required the control room operators to manually close the MSIVs, according to procedure, when the automatic function did not occur at the expected condenser pressure. Considering the misadjusted setpoint, the automatic closure of the MSIVs would have occurred at 2.8 inches of Hg vacuum. Initiation of automatic MSIV closure at that pressure would have been adequate to prevent condenser over-pressurization. A positive condenser pressure could rupture the diaphragm that is installed to protect the turbine exhaust hood and prevent a potential radiation leakage path following an accident. Condenser vacuum has been maintained within the normal operating range throughout the current operating cycle.

Event Description

On February 1, 2000 with the plant in mode 1 at 100% power it was determined that the Main Steam Isolation Valves (MSIVs) [JM] would not have closed automatically within the value allowed by the Technical Specifications. This condition was discovered after performance of a channel functional test of the main condenser vacuum-low instrumentation to meet Surveillance Requirement (SR) 3.3.6.1.2 for Function 1.d of Table 3.3.6.1-1 of the WNP-2 Technical Specifications. The instrumentation functions to generate a close signal to the MSIVs upon sensing a low condenser vacuum condition. The setpoints for two pressure switches that perform the function were found to be 2.8 and 2.4 inches of mercury (Hg) vacuum. This setting exceeded the Technical Specifications allowable value of greater than or equal to 7.2 inches Hg vacuum. A subsequent review revealed that the switches had been misadjusted during the previous calibration on November 10, 1999, and the out of tolerance condition had existed since then. Had a loss of condenser vacuum occurred, the MSIVs would not have closed automatically in response to low condenser vacuum until the pressure reached 2.8 inches Hg vacuum. Initiation of the automatic function at the higher pressure would have been adequate to fulfill the purpose of this function. MSIV closure is initiated to prevent additional condenser pressurization that could possibly rupture the diaphragm that is installed to protect the turbine exhaust hood and prevent a potential radiation leakage path following an accident.

Immediate Corrective Action

Immediately after the pressure switches were found to be out of tolerance they were readjusted to the correct setpoint in accordance with the applicable surveillance procedures. This action restored the automatic initiation of the MSIV closure on condenser low vacuum function to the required value. Additionally, a check of the accuracy of the calibrated test gauge used to measure the setpoint of the switches was performed when both switches were found out of tolerance. The test gauge was found to be within its required calibration tolerance.

Further Evaluation

The isolation logic scheme for MSIV closure is a "one out of two taken twice" arrangement. This means that to close the MSIVs, a close signal must be generated from channel A or C and channel B or D. The pressure switches that were found out of tolerance were the B and D channels. Since channels B and D would not have actuated at the proper setpoint, the MSIV closure logic would not have been satisfied until condenser pressure increased to 2.8 inches of Hg vacuum. November test data for channels A and C did not indicate an abnormal setpoint. The A and C channels were tested subsequent to the discovery of this condition and found to be within the required setpoint range. A depiction of this logic arrangement for automatic MSIV closure is found on Figure 7.3-2 in the WNP-2 Final Safety Analysis Report.

Root Cause

The root cause for this condition has been determined to be a human error that resulted in inadequate performance of the channel functional test when the channel B and D pressure switches were tested on November 10, 1999. This is apparent when analyzing the as found data taken from the November and January tests. Because the November 1999 test was not performed correctly, these switches appeared to be set at 13.6 and 12.8 inches Hg vacuum and were then adjusted to what appeared to be a value within the normal setpoint range. The January test was performed correctly and the setpoints were found to actually be 2.4 and 2.8 inches of Hg vacuum. The as found data for the January test was out of tolerance by approximately the same magnitude from the nominal setpoint but in the opposite direction from the November test. This supports the conclusion that because the November 1999 test was performed inadequately, it resulted in false high readings that prompted the test performer to adjust the setpoint to a lower non-conservative setpoint. In the November test an electric vacuum pump and vent valve arrangement was used to establish and regulate a negative pressure to check the setpoint of the switch. The vacuum within the test boundary was measured with a calibrated test gauge connected to the pressure switch with approximately 30 feet of tubing. This arrangement is not conducive to establishing a static pressure within the test boundary. This configuration was recreated during the root cause investigation. It was demonstrated that if there was a restriction in the tubing and if the fittings connecting the tubing were not tight, it created an offset between the pressure at the switch and the pressure read on the calibrated test gauge used to measure the setpoint. In the January test, a closed system was used featuring a mechanical bellows for changing the volume of the test boundary and thereby controlling vacuum. Because this was a closed system any leaks would be manifest by an inability to maintain a constant vacuum. The closed test system also establishes a static pressure within the test boundary that is applied equally to the pressure switch and the calibrated test gauge and is a more accurate method of measuring the setpoint of the condenser vacuum switch.

Further Corrective Action

To prevent recurrence of a human error resulting in an inadequately performed test, surveillance procedures involving vacuum test applications will be revised. Additional precautions will be added instructing test performers to either use hand operated vacuum devices such as a mechanical bellows, or perform testing to verify the integrity of the test boundary when using an electric vacuum pump.

Assessment of Safety Consequences

MSIV closure in response to a condenser low vacuum condition is initiated to prevent the addition of steam that would lead to additional condenser pressurization. Elevated condenser pressure could possibly rupture the diaphragm that is installed to protect the turbine exhaust hood. Rupture of this diaphragm would also create a potential radiation leakage path following an accident. The condenser pressure that could have resulted from the automatic MSIV closure at 2.8 inches of Hg vacuum would not have been sufficient to reach the turbine exhaust diaphragm burst pressure of 5 pounds per square inch (psi). For this reason, it is not postulated that a leakage path for radioactive steam could have been created by this condition. Additionally, control room operators are trained and expected to manually initiate any automatic function that fails to occur at the required process value. This training is consistent with guidance provided in NUREG-1021. Other automatic functions that occur to mitigate a decrease in condenser vacuum are a turbine trip at 20 inches of Hg vacuum and closure of the turbine bypass valves at 7 inches Hg vacuum. The WNP-2 abnormal condition procedure for loss of condenser vacuum provides instructions for control room operators during this condition. The procedure instructs the operators to consider initiating a reactor scram if an automatic turbine trip is imminent and reduce reactor power as necessary to maintain turbine exhaust pressure and temperature within limits. The procedure also instructs the control room operators to verify all automatic functions have occurred. Implicit in this statement is the expectation to manually initiate those functions that have not automatically occurred as expected. For these reasons and considering that condenser vacuum has been maintained within the normal operating range throughout the current operating cycle, there have been no safety consequences as a result of this condition.

Similar Events

There have been no previous similar events at WNP-2 that have resulted in the possibility of an automatic function occurring outside of the process value required by Technical Specifications due to allowing a setpoint to remain out of tolerance.