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SUBJECT: LER 95-009-00:on 950607,inadvertent MSIV closure occurred during surveillance test due to poor communication between test team.Determined that MSIV closure not valid because closure not triggered by plant conditions.W/950707 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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July 7, 1995
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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. 95-009-00

Transmitted herewith is Licensee Event Report No. 95-009-00 for the WNP-2 Plant. This report is submitted in response to the reporting requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Should you have any questions or desire additional information, please call me or D.A. Swank at (509) 377-4563.

Sincerely,

GO Smith/for

J. V. Parrish (Mail Drop 1023)
Vice President, Nuclear Operations

JVP/CJF/mky
Enclosure

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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 4

TITLE (4)

INADVERTENT MAIN STEAM ISOLATION VALVE CLOSURE

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 6	0 7	9 5	9 5	0 0 9	0 0	0 7	0 7	9 5		0 5 0 0 0
										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)	X 50.73(a)(2)(iv)	_ 73.71(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	TELEPHONE NUMBER
CJ Foley, Licensing Engineer	AREA CODE 5 0 9 3 7 7 - 4 2 3 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)

On June 7, 1995, WNP-2 was in cold shutdown. An unexpected closure of the inboard and outboard Main Steam Isolation Valves (MSIVs) occurred during performance of a surveillance test intended to verify the operability of instrumentation used to provide MSIV position data to the Reactor Protection System (RPS). The closure was not valid because it had not been triggered by plant conditions, but by activity performed under a procedure that did not completely define all necessary steps for successful completion of the tests. All systems and components responded as designed to the test sequence established in the surveillance procedure. The procedure was updated to address the inadequacies. The testing was resumed and completed satisfactorily. The NRC was notified of the event using the Emergency Notification System because closure of the MSIVs was an actuation of an Engineered Safety Feature. This event had no safety significance.

Event Description

On June 7, 1995 at 2017 hours, WNP-2 was in Operational Condition 4, "cold shutdown." Post maintenance testing was underway to support plant start up after the annual maintenance and refueling outage. An unexpected closure of the inboard and outboard Main Steam Isolation Valves (MSIVs) [SB, ISV] occurred during performance of a surveillance test intended to verify the operability of circuitry providing MSIV position data to the Reactor Protection System (RPS) [JC].

Immediate Corrective Action

Operators determined that the MSIV closure was not valid because it had not been triggered by plant conditions. The RPS and Nuclear Steam Supply Shutoff System (NSSSS) closure logic circuitry had responded as designed to the sequence established in the surveillance procedure which did not identify the need to reset logic circuits during the course of the test. The testing was resumed and completed satisfactorily. The procedure was updated to address the weaknesses. The NRC was notified of the event using the Emergency Notification System on June 8 at 0008 hours, per 10CFR50.72(b)(2)(ii) because closure of the MSIVs was an actuation of an Engineered Safety Feature.

Further Evaluation

There were no structures, systems, or components that were inoperable that contributed to the event.

Post maintenance testing was being performed after MSIV position limit switches had been replaced due to failures during surveillance tests. These failures occurred because of lubricant breakdown, a failure mode not originally anticipated by the manufacturer. The manufacturer test report originally indicated that lubricants were not subject to thermal degradation. However, industry experience similar to WNP-2 led the manufacturer to change the lubricant for these switches and to upgrade their manufacturing quality control in regard to switch lubrication. The replacement switches were manufactured under the revised quality control program using the new lubricant type. An additional manufacturer recommendation was to perform functional testing on at least a 18 to 20 month cycle; at WNP-2 surveillance testing is performed annually consistent with the 12-month fuel cycle and identified the failures leading to replacement of the switches.

The RPS is designed to initiate a reactor scram based on a variety of possible inputs, including closure of the MSIVs. The NSSSS is designed to close reactor system isolation valves to contain radioactive materials inside primary containment [NH]; isolation valve closure is automatic, based on a different variety of possible inputs. RPS and NSSSS trips are governed by separate logic circuitry. The surveillance testing being performed was intended to verify operability of the circuitry providing MSIV position input to the RPS and therefore, involved elements of both logic systems.

The surveillance testing is performed in phases to cover the four RPS logic channels comprising the two RPS trip systems "A" and "B." The test requires closing and opening of the MSIVs to actuate valve position limit switches [ZIS] to verify that the MSIV position signal would correctly be transmitted to the RPS. Plant design is such that the position input for all inboard MSIVs is combined into a single input to RPS trip system "A," and all outboard MSIV position input to RPS trip system "B." In order to perform the test, fuses [FU] are removed so that the position input from each individual MSIV can be verified as being correctly transmitted to the RPS logic. Normally, this test is performed during power operation. Testing during nonpower operation requires that an additional fuse be removed from the RPS circuitry to disable the MSIV closure scram bypass logic which is included in the design to permit operating the MSIVs during nonpower operation. This results in an 'insufficient condenser vacuum' signal being transmitted to the NSSSS isolation logic, resultant 'half isolation' of the NSSSS isolation logic, and actuation of several annunciators [ANN]. If the NSSSS isolation logic channel is not reset before tripping a logic channel in the opposite NSSSS trip system, the MSIVs will automatically close when the fuse is removed. This is the sequence that occurred during this event. The procedure correctly required re-installation of the fuses previously removed to restore the MSIV closure scram bypass logic to normal operation at the end of each phase of testing during Mode 2, 3, 4, or 5. However, it did not explicitly require resetting the half isolation, nor did it identify all the annunciators that are actuated by fuse removal. This was identified as a procedural weakness.

The testing was performed by two crews over two shifts; each crew was led by a licensed operator. The operator leading the first crew was aware that, although not addressed by the procedure, (1) removal of the fuse to disable the MSIV closure scram logic would cause a 'half isolation' of the MSIVs and actuation of certain annunciators, and (2) it was necessary to reset the NSSSS isolation logic channel before proceeding to test a logic channel in the opposite NSSSS trip system. They successfully completed testing of one RPS logic channel in the "A" trip system, and reset the NSSSS isolation logic channel although not required by the procedure. However, the operator did not initiate procedural changes to address the weaknesses, nor did he clearly identify those weaknesses to his test crew, to Control Room supervision, or at turnover to the second test crew. The operator leading the second crew was unfamiliar with the test procedure and its weaknesses. The second crew successfully completed testing of the remaining RPS logic channel in the "A" trip system. Although they noted that an unexpected annunciator indication of a 'half isolation' of the MSIVs had occurred, they did not reset the NSSSS isolation logic channel under the assumption that all resets would be performed by completion of the test procedure. They then began testing a RPS logic channel in the "B" trip system and automatic MSIV closure occurred when the fuse was removed.

The event was discussed with the Control Room Supervisor and Shift Manager, and testing was completed by assuring that the logic channels were reset at the end of each phase of testing.

Root Cause

The root causes of the event are poor communication between test team members and a lack of knowledge by the second operator in regard to system responses to fuse removal. Contributing causes were a weak test procedure, poor communication between test crews at turnover, failure to address known procedural weaknesses on a timely basis, lack of a questioning attitude when faced with unexpected results, and lack of adequate technical review of test procedures performed on a nonroutine basis.

Further Corrective Action

The procedure governing this test was revised to identify the need to reset NSSSS logic channels at the end of each test phase, and to identify all annunciator responses expected during testing. Licensed operators involved in the test will be counseled by July 15, 1995 to emphasize the expectations to have a questioning attitude in the face of unexpected plant responses, and to include other crew members when dealing with unexpected alarms. Management expectations to promptly correct procedural weaknesses and to include all crew members in responding to unexpected events will be emphasized by July 15, 1995 to both licensed and unlicensed operators. The process of preparing procedures will be revised by July 15, 1995 to require verification that a procedure correctly includes all necessary steps for each plant operating condition in which the procedures can be performed. The revised process will include review by Engineering personnel to assure adequacy and completeness.

Safety Significance

The event had no safety significance. The MSIVs and RPS logic system responded as designed to the invalid isolation signal. No plant condition requiring MSIV closure existed. There were no related operational evolutions underway that were adversely impacted.

Similar Events

LER 87-021, "Inadvertent Nuclear Steam Supply Shutoff System Isolation (Group 1) During Performance of Surveillance Procedure - Personnel Error" reports a full isolation of the MSIVs caused by failure to reset 'half isolations' during performance of a channel functional test during operational condition 4 of pressure switches associated with the Main Steam System. In that case, the procedure required the logic to be reset before proceeding to the next part of the testing, but due to personnel error that step was not performed in the required sequence. The corrective action taken was to counsel the personnel and to divide the testing between two procedures each focused on testing of a single trip system.