



Constellation
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Nine Mile Point
Nuclear Station

*A Member of the
Constellation Energy Group*

December 14, 2001
NMP2L 2041

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 2
 Docket No. 50-410
 NPF-69

***Subject: Reactor Scram Due to Inadequate Main Steam Isolation Valve
 Surveillance Procedure***

Gentlemen:

In accordance with 10 CFR 50.73(a)(2)(iv)(A) we are submitting Licensee Event Report 01-004, "Reactor Scram Due to Inadequate Main Steam Isolation Valve Surveillance Procedure."

Very truly yours,

Michael F. Peckham
Unit 2 Plant General Manager

MFP/KLE/cld
Attachment

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
 Mr. G. K. Hunegs, NRC Senior Resident Inspector
 Records Management

IE22

Rec'd
01/23/02

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1) Nine Mile Point, Unit 2	DOCKET NUMBER (2) 05000410	PAGE (3) 1 OF 4
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TITLE (4)
Reactor Scram Due to Inadequate Main Steam Isolation Valve Surveillance Procedure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	15	2001	2001	004	00	12	14	2001	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)									
POWER LEVEL (10) 100	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	X 50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)							
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)								
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)								

LICENSEE CONTACT FOR THIS LER (12)

NAME B. W. O'Brien, Manager Unit 2 Maintenance	TELEPHONE NUMBER (include Area Code) 315-349-4767
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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)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 15, 2001 at approximately 0959, Nine Mile Point Unit 2 (NMP2) scrambled from approximately 100 percent power due to closure of the Main Steam Isolation Valves (MSIVs). Post scram the Safety Relief Valves (SRVs) were used for reactor pressure control until the MSIVs were re-opened. The scram occurred while restoring a steam flow transmitter after surveillance testing.

Post scram two high reactor water level conditions occurred that resulted in level 8 conditions. The first level 8 condition caused the "A" and "B" feedwater pumps to trip, as designed. The "A" feedwater pump was later re-started. The second level 8 condition resulted in the operating "A" feedwater pump tripping, as designed. Reactor pressure was then reduced so that the condensate booster pumps could be used for inventory control. While reducing pressure, a low reactor water level condition occurred. A level 2 condition occurred that resulted in actuation of the Reactor Core Isolation Cooling (RCIC) System and the High Pressure Core Spray (HPCS) System and closure signals to Primary Containment Isolation Valve groups 2,3,6,7,8 and 9. Reactor water level was recovered using RCIC and HPCS. Reactor pressure was reduced and the condensate booster pumps were used to provide inventory control. RCIC and HPCS were then returned to standby. Reactor pressure was reduced to approximately 150 pounds per square inch; the MSIVs were re-opened and reactor pressure control was shifted to the Turbine Bypass valves.

The cause of the reactor scram was an inadequate surveillance procedure. The causes of the low reactor water level condition were training issues relative to transient operation of RCIC and selection of a less than optimum event mitigation strategy. Corrective actions include benchmarking methods of restoration of similar transmitters, reviewing activities performed at power that are classified as trip sensitive, reviewing the event with operating crews and developing training on the effect of SRV opening on reactor water level.

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

I. Description of Event

On October 15, 2001, at approximately 0959 hours Nine Mile Point Unit 2 (NMP2) scrambled from approximately 100 percent power when all Main Steam Isolation Valves (MSIVs) closed. The MSIV closure occurred as technicians were restoring steam flow transmitter 2MSS*FT12A to service following calibration. All control rods fully inserted on the scram.

During the event the maximum reactor system pressure was approximately 1100 pounds per square inch gage (psig) resulting from the MSIV closure. The Safety Relief Valves (SRVs) were used for pressure control until the MSIVs were reopened, which occurred at approximately 1600 hours.

Post scram both the "A" and "B" feedwater pumps were running. Because of known leakage past the level control valves (LCVs), the reactor operator took manual control of the LCVs, verified them shut and closed the feedwater pump isolation valves in order to prevent a high water level in the reactor vessel. However, at approximately 1003 hours when an SRV was opened for pressure control, reactor water level swelled above the level 8 setpoint causing both feedwater pumps to trip as designed. At 1009 hours the "A" feedwater pump was re-started. At 1027 hours an SRV was opened for pressure control and reactor water level swelled above the level 8 setpoint causing the "A" feedwater pump to trip. After the second level 8 condition, the operating crew decided to lower reactor pressure within a range of 550 psig to 650 psig so that the condensate booster pumps could be used for inventory control. At 1043 hours, the SRV that had been opened for pressure control was closed, which caused the reactor water level to shrink to the level 2 setpoint. At the level 2 setpoint Reactor Core Isolation Cooling (RCIC) and High Pressure Core Spray (HPCS) actuated as designed along with the Division III diesel generator (HPCS power supply). Primary Containment Isolation Valve groups 2,3,6,7,8 and 9 also isolated, as designed, on the level 2 signal. Primary Containment Isolation Valve groups 4 and 5 had received an isolation signal at level 3. RCIC and HPCS were used to restore reactor water level at which point the HPCS injection valve was closed. RCIC remained in service until reactor pressure was reduced such that the condensate booster pumps could provide inventory control. HPCS was returned to standby at approximately 1105 and RCIC was returned to standby at approximately 1113 hours. Reactor pressure was lowered to approximately 150 psig to allow re-opening of the MSIVs. At approximately 1603 the MSIVs were re-opened and the Turbine Bypass Valves were used for pressure control.

A post scram review concluded that restoration of steam flow transmitter 2MSS*FT12A caused the MSIV closure. When the "High" side of 2MSS*FT12A was being opened, a pressure pulse was generated that was sensed as a high flow on transmitter 2MSS*FT13A. These flow transmitters share a common reference leg but input to separate MSIV isolation logic channels. The pressure pulse resulted in a high flow signal from transmitter 2MSS*FT13A to the logic circuit. As a result of the calibration procedure, a high flow signal was already present from transmitter 2MSS*FT12A in the MSIV isolation circuitry. High flow signals from both of the flow transmitters resulted in the closure of the MSIVs.

II. Cause of Event

The cause of the reactor scram was closure of the MSIVs. The cause of the MSIV closure was that the testing procedure was not sufficiently tolerant of the variables involved such as valving the transmitters in and out of service by different personnel. Contributing causes were ineffective change management, in that the risks associated with moving the surveillance from being performed while shutdown to being performed while at power were not adequately assessed. Since 1995, the surveillance had been conducted successfully 64 times with the plant at power, which impacted the crew's sensitivity to the surveillance.

The causes of the low reactor water level condition were training issues relative to transient operation of RCIC and selection of a less than optimum event mitigation strategy. The operators thought that the SRVs could reduce reactor pressure sufficiently to use the condensate booster pumps without reaching level 2. The operators were concerned that using the SRVs for pressure control in conjunction with RCIC would result in reactor water levels that would prevent resetting the reactor scram. The crew understood that SRV operation would result in lower reactor water inventory. However, the crew did not know the amount of inventory that would be lost with SRV operation. Contributing causes are (1) inadequate communication in that some reactor water level information was not transmitted to the Control Room Supervisor, and (2) the crew did not have adequate simulator experience managing reactor water level and pressure with the MSIVs shut.

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III. Analysis of Event

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) having met the following criteria: 10 CFR 50.73(a)(2)(iv)(B)(1) because of the reactor scram; 10 CFR 50.73(a)(2)(iv)(B)(2) because of the level 2 Primary Containment Isolation signals; 10 CFR 50.73(a)(2)(iv)(B)(4) because of the HPCS actuation; 10 CFR 50.73(a)(2)(iv)(B)(5) because of the RCIC actuation; 10 CFR 50.73(a)(2)(iv)(B)(8) because of the Division III diesel generator starting. The closure of the MSIVs is also reported in this Licensee Event Report in lieu of a 60-day telephone report as an invalid actuation of multiple MSIVs in accordance with 10 CFR 50.73(a)(2)(iv)(A).

Post scram, feedwater, RCIC and HPCS functioned as designed to maintain reactor water level.

A Probabilistic Risk Analysis (PRA) of the event concluded that the estimated Conditional Core Damage Probability for this event was 9 E-7 and the change in Core Damage Frequency for this event was 4 E-8. The PRA assessment of this event concluded that it was not risk significant.

Based on the above, the event did not pose a threat to the health and safety of the public or plant personnel.

IV. Corrective Actions

1. The appropriate Instrumentation and Controls technicians were briefed on the event.
2. A post event review was conducted with operating crews.
3. Benchmarked the industry to determine best method to return similar transmitters to service.
4. Reinforced crew team dynamics in the control room with all licensed operators and operations trainers.
5. Modify surveillance procedure, N2-ISP-MSS-R102, based upon benchmarking results. This will be completed by May 30, 2002.
6. Review the remaining tests that are performed at power and other routine activities classified as trip sensitive to ensure the activity does not place the performer in a situation that could lead to an unexpected system actuation. This will be completed by April 30, 2002.
7. Establish an administrative control to assure that procedures that are normally conducted while shut down are reviewed for barrier adequacy prior to conducting the procedure at power. This will be completed by February 14, 2002.
8. An MSIV isolation scenario will be developed and implemented to train the NMP2 crews. This training scenario will include the effects on reactor pressure control when RCIC is used. The training development and implementation will be completed by February 21, 2002.
9. Training will be developed to address the change in reactor water level versus length of time SRVs are open. Training will be developed by June 12, 2002.

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V. Additional Information

- A. Failed Components: None
- B. Previous similar events:
 LER 00-11, "Missed Technical Specification for Primary Containment Integrity Due to a Failure to Revise a Surveillance Procedure After Issuing an Engineering Change Notice," describes a missed surveillance because a procedure had not been updated. The corrective actions would not have prevented the MSIV closure. LER 97-07, "Failure to Calibrate Hydrogen Recombiner Instruments as Required By Technical Specifications due to Procedure Omission," describes missed surveillance requirements because of an inadequate procedure. The associated corrective actions would not have prevented the MSIV closure.
- C. Identification of components referred to in this Licensee Event Report

<u>Components</u>	<u>IEEE 805 System ID</u>	<u>IEEE 803A Function</u>
Main Steam System	SB	N/A
Feedwater System	SJ	N/A
Turbine Bypass System	JI	N/A
Reactor	AC	N/A
Control Rod Drive System	AA	N/A
Reactor Core Isolation Cooling	BN	N/A
High Pressure Core Spray	BG	N/A
Condensate System	SD	N/A
Pump	BG, BN, SJ, SD	P
Valve	SB, SJ, JI, BG	FCV, LCV, ISV, RV, INV
Rod	AA	ROD