

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

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License No.: DPR-63

Licensee: Niagara Mohawk Power Corporation
P. O. Box 63
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Facility: Nine Mile Point, Unit 1

Location: Scriba, New York

Dates: April 4 - June 9, 1998

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EXECUTIVE SUMMARY

Nine Mile Point Unit 1

50-220/98-11

April 4 - June 9, 1998

This NRC special inspection report includes the results of independent inspection and a review of licensee activities in response to the failure to properly restore a safety system to an operable condition and the resultant degradation of primary containment integrity for 3.5 days.

PLANT OPERATIONS

A Unit 1 reactor operator failed to follow the operating procedure for restoration of the containment spray system to its standby configuration resulting in the system being in a degraded condition for 3.5 days. This was a violation of Technical Specification 6.8.1, involving the failure to implement procedures, as written. (VIO 50-220/98-11-01)

Between April 7 and 11, over sixty control panel walkdowns were unsuccessful in identifying this containment spray system mis-positioned valve. This was a significant operations staff oversight and indicative of a lack of attentiveness to safety system configuration. In contrast, the in-plant operator's identification of the breaker open/closed indicating lights deficiency demonstrated good attention to detail, proper awareness of plant conditions, and prompt and appropriate response to a deficient condition.

The licensee's immediate action to conduct control panel system line-up verifications without referring to the system operating procedures was a poorly founded decision based upon the control room operators not having identified the flow control valve out-of-position for 3.5 days by relying on unaided memory of proper systems' configuration.

The identification of FCV 80-118 as a primary containment isolation valve by the systems engineer was good, but the oversight by the operations staff of this valve's primary containment isolation function reflects poorly on their systems knowledge and sensitivity to containment integrity monitoring. The failure to maintain primary containment integrity for 3.5 days was a violation of the Unit 1 Technical Specification 3.3.0. (VIO 50-220/98-11-02)

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REPORT DETAILS

Nine Mile Point Unit 1
50-220/98-11
April 4 - June 9, 1998

I. OPERATIONS

O1 Conduct of Operations

O1.1 Failure to Follow the Operating Procedure Resulted in the Unit 1 Containment Spray System Being Degraded

a. Inspection Scope (71707)¹

On April 7, 1998, while operating at full power, the Unit 1 reactor operator (RO) responsible for restoring the containment spray (CS) system to the standby condition failed to close the remote manual test return valve. This adverse condition was not recognized for 3.5 days, even though there were over 60 control room panel walkdowns conducted by three different operating shift crews.

The inspectors discussed the event with the Unit 1 Operations Manager and the General Supervisor of Operations (GSO) and conducted independent interviews with the responsible RO and several other ROs and senior reactor operators (SROs) who performed the panel walkdowns before the open valve was identified. In addition, the inspectors observed management meetings related to the event, including a Station Operations Review Committee (SORC) meeting, and reviewed the associated operating procedures, the Unit 1 Technical Specifications (TSs) and Updated Final Safety Analysis Report (UFSAR). The inspectors also conducted an independent walkdown of the control room panels to verify that all safety systems were aligned properly.

b. Observations and Findings

On April 7, operators were using the #121 CS pump to lower water level in the torus per NMPC Operating Procedure N1-OP-14, "Containment Spray System." As required by the TSs, the appropriate Limiting Condition for Operations (LCOs) were entered. After the desired torus level was achieved, the Assistant Station Shift Supervisor (ASSS) directed the operators to restore the containment spray system to the standby condition, using Section "G" of N1-OP-14. The Chief Shift Operator (CSO) performed the portions of the procedure in the control room and directed an in-plant operator to perform those steps outside of the control room. The inspectors determined that the CSO was using a controlled working copy of the procedure and was using the "place keeping" method of checking off the steps as they were

¹ Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics. The NRC inspection manual procedure or temporary instruction (TI) that was used as inspection guidance is listed for each applicable report section.



completed. The day-shift crew that started the restoration completed steps G.1.1 through G.2.12. This crew was then relieved by the night-shift crew. The night-shift CSO was tasked with completing the remainder of the restoration; specifically, steps G.2.13 through G.2.19. At 8:23 pm, the CSO reported that the containment system restoration was complete, and that the ASSS could exit the applicable TS LCOs. However, as discovered on April 11, the CSO failed to perform step G.2.18 which states, in part, to verify closed valve 80-118, the containment spray test return to torus flow control valve (FCV). The failure to properly complete step G.2.18 of procedure N1-OP-14 is a violation of Unit 1 TS, Section 6.8.1, which requires procedures to be implemented, as written. (VIO 50-220/98-11-01)

The inspector determined that for the remainder of the April 7 night shift, and subsequent shifts until April 11, the CSO or extra control room operator (CRE) performed panel walkdowns every two hours, as prescribed by the Operations Manager. This expectation is contained in the Nine Mile Point Operations Manual (common to both units) and the Unit 1 Reference Manual (predecessor to the Operations Manual). However, the inspector noted that there is no specific guidance for the panel walkdowns, such as systems' valve position checklists, to ensure the standby configuration of each safety system. Additionally, procedure N1-ODP-OPS-0101, "Shift Turnover and Brief," requires each oncoming RO and SRO to walkdown the control room panels prior to assuming the shift. This requirement, likewise, does not provide specific guidance as to what the turnover panel walkdown should accomplish. As a consequence, over 60 control room panel walkdowns were unsuccessful in identifying the mispositioned FCV 80-118.

At approximately 8:30 am, on April 11, an in-plant operator noted that both the open (red) and closed (green) indicating lights on the local panel for the FCV 80-118 motor operator breaker were not lit. After replacing the light bulbs, the operator recognized that FCV 80-118 should be closed and immediately notified the control room. The SSS directed that the valve be closed and the TS LCOs properly exited (valve 80-118 was closed before the CS system LCO allowed outage time expired). The SSS initiated Deviation/Event Report (DER) 1-98-0851 to document this event and to initiate a root cause analysis and identify appropriate corrective actions. At that time, the event was determined not reportable to the NRC.

Inspector follow-up identified that a verification checklist previously used at Unit 1, on a shiftly basis, had been eliminated about three years ago. The inspectors learned that the checklist had been removed from N1-ODP-OPS-0101 because the control room operators did not see any benefit to the checklist based upon no valves ever being identified as out-of-position using the checklist. As a corrective action, the GSO re-instituted the use of a checklist at Unit 1. The inspectors confirmed that a system status checklist was still in use at Unit 2. After using the new checklist for several weeks, the checklist was revised and incorporated into the preventive maintenance program (N1-PM-S5, "Control Room System Lineup Verification").



Additional corrective actions for this event included a verification, using N1-OP-14, that the other valves manipulated to lower torus level were in the proper position and a panel walkdown (without using system operating procedures), to ensure that all safety systems were properly aligned in their standby configuration. No discrepancies were identified. The inspectors considered the decision to conduct the panel walkdowns without referring to the system lineups in the operating procedures to be a weak corrective action because of the susceptibility to human error by verifying the safety system standby line-ups from memory. This observation was discussed with the GSO and a second panel walkdown was performed using the applicable operating procedures. No discrepancies were identified. The inspectors conducted an independent safety system panel walkdown using the Operational Safety Verification Checklist, developed by the resident staff, and identified proper systems' configuration.

c. Conclusions

A Unit 1 reactor operator failed to follow the operating procedure for restoration of the containment spray system to its standby configuration resulting in the system being in a degraded condition for 3.5 days. This was a violation of Technical Specification 6.8.1, involving the failure to implement procedures, as written. (VIO 50-220/98-11-01)

Between April 7 and 11, over sixty control panel walkdowns were unsuccessful in identifying this containment spray system mis-positioned valve. This was a significant operations staff oversight and indicative of a lack of attentiveness to safety system configuration. In contrast, the in-plant operator's identification of the breaker open/closed indicating lights deficiency demonstrated good attention to detail, proper awareness of plant conditions, and prompt and appropriate response to a deficient condition.

The licensee's immediate action to conduct control panel system line-up verifications without referring to the system operating procedures was a poorly founded decision based upon the control room operators not having identified the flow control valve out-of-position for 3.5 days by relying on unaided memory of proper systems' configuration.

01.2 FCV 80-118 Primary Containment Isolation Function

a. Inspection Scope (71707)

During the licensee's follow-up of the FCV 80-118 mis-position event, they identified that FCV 80-118 is also a primary containment isolation valve (PCIV). As such, the DER was revised and a 10 CFR 50.72 notification was made. The inspectors reviewed the revised DER, the UFSAR and TSs, and discussed the issue with Unit 1 management. The inspectors also interviewed the SSS who made the original reportability decision and observed the SORC meeting for the associated Licensee Event Report (LER).



b. Observations and Findings

The system engineer's involvement in the disposition of DER 1-98-0851 resulted in the recognition that FCV 80-118 also serves a primary containment isolation function. The Unit 1 UFSAR, Table VI-3b, "Primary Containment Isolation Valves [for] Lines Entering Free Space of the Containment," lists the normal position of FCV 80-118 as "Closed." FCV 80-118 is a remote manual valve and does not have an automatic containment isolation feature. Unit 1 TS, Section 1.11.a, defines primary containment integrity and lists the conditions which must be satisfied. One of those conditions is that all non-automatic PCIVs, not required to be open for routine plant operations, must be maintained closed. TS Section 3.3.0 requires primary containment to be maintained when the reactor is critical. The failure to maintain primary containment integrity from April 7 through April 11, 1998, is a violation of Technical Specifications. (VIO 50-220/98-11-02)

In-office inspector review of the primary containment integrity TS non-compliance identified that, although TS defined containment integrity (remote manual valves closed) was not satisfied, containment integrity was not significantly challenged by the open FCV 80-118. The design of the containment spray system, as a closed loop extension of primary containment and the inability to local leak rate test the system's PCIVs (pre-Standard Review Plan facility), necessitated an NRC approved exemption from 10 CFR 50, Appendix J, testing requirements. Specifically, the automatic operation of the containment spray system under design basis accident (DBA) conditions ensures the establishment of a water seal between the primary containment free air space and the outside environment. The inspectors determined that, even under worst case single failure conditions (loss of one emergency diesel generator and its associated electrical bus), the water seal is maintained. With FCV 80-118 open, the water seal is degraded due to the diversion of flow and resultant lower CS system developed head at the containment spray nozzles. However, a single operating CS pump in each loop ensures sufficient system pressure above containment accident pressure to provide containment integrity.

The inspectors identified that there was no TS required periodic verification of PCIV status. In contrast, the Unit 2 TSs have a monthly surveillance for this specific purpose. Following discussions with the GSO, this issue was captured in another DER (1-98-1033) and forwarded with a recommendation to perform such a verification at Unit 1. The inspectors consider the absence of such a verification to be a weakness in the Unit 1 surveillance program.

c. Conclusions

The identification of FCV 80-118 as a primary containment isolation valve by the systems engineer was good, but the oversight by the operations staff of this valve's primary containment isolation function reflects poorly on their systems knowledge and sensitivity to containment integrity monitoring. The failure to maintain primary containment integrity for 3.5 days was a violation of the Unit 1 Technical Specification 3.3.0. (VIO 50-220/98-11-02)



O8 Miscellaneous Operations Issues**O8.1 (Closed) LER 50-220/98-04: Containment Isolation Valve Left Open in Violation of Technical Specifications Due to Personnel Error (90712)**

The events associated with this LER were described in Sections O1.1 and O1.2 of this inspection report. The inspectors conducted an in-office review and verified that the LER fulfilled the requirements of 10CFR50.73. Specifically, the description and analysis of the event were consistent with the inspectors' understanding of the event. The root cause and corrective actions described in the LER were appropriate. This LER is closed.

V. MANAGEMENT MEETINGS**X1 Exit Meeting Summary**

At periodic intervals, and at the conclusion of the inspection period, meetings were held with senior station management to discuss the scope and findings of this inspection. A preliminary exit meeting was held on May 8, during which the inspectors initial findings were presented. On June 10, 1998 the final exit was held. NMPC did not dispute any of the findings or conclusions. Based on the NRC Region I review of this report, and discussions with NMPC representatives, it was determined that this report does not contain safeguards or proprietary information.



ATTACHMENT 1

PARTIAL LIST OF NMPC PERSONS CONTACTED

R. Abbott	Vice President, Nuclear Engineering
B. Booth	General Supervisor of Operations, Unit 1
J. Conway	Vice President, Nuclear Generation
P. Farsaci	Supervisor of Operations, Unit 1
T. Gardner	Chief Shift Operator, Unit 1
P. Mezzafero	Manager, Unit 1 Technical Support
J. Mueller	Senior Vice President & Chief Nuclear Officer
B. Murtha	Manager, Unit 1 Operations (Acting)
B. Ness	Assistant Station Shift Operator, Unit 1
R. Sanaker	Station Shift Supervisor, Unit 1
R. Smith	Plant Manager, Unit 1
C. Terry	Vice President, Nuclear Safety Assessment & Support
D. Wolniak	Manager, Licensing

INSPECTION PROCEDURES USED

IP 71707	Plant Operations
IP 90712	In-Office Review of Written Reports of Nonroutine Events at Power Reactors

ITEMS OPENED, CLOSED, AND UPDATED

OPENED

50-220/98-11-01	VIO	Failure to follow operating procedure for restoration of containment spray system
50-220/98-11-02	VIO	Failure to maintain primary containment integrity

CLOSED

50-220/98-04	LER	Containment isolation valve left open in violation of TSs due to personnel error
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UPDATED

none



LIST OF ACRONYMS USED

ASSS	Assistant Station Shift Supervisor
CFR	Code of Federal Regulations
DER	Deviation/Event Report
EA	Enforcement Action
ECCS	Emergency Core Cooling System
EEL	Escalated Enforcement Item
ESF	Engineered Safeguards Feature
GSO	General Supervisor of Operations
IR	Inspection Report
LER	Licensee Event Report
NMPC	Niagara Mohawk Power Corporation
NRC	Nuclear Regulatory Commission
RO	Reactor Operator
SORC	Station Operating Review Committee
SRO	Senior Reactor Operator
SSS	Station Shift Supervisor
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Unit 1	Nine Mile Point Unit 1
VIO	Violation
PCIV	Primary Containment Isolation Valve

