



December 22, 2000  
NMP2L 2005

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

RE: Docket No. 50-410  
Licensee Event Report 00-16, Supplement 1

Gentlemen:

In accordance with 10 CFR 50.73(a)(2)(i), we are submitting Licensee Event Report 00-16, Supplement 1, "Primary Containment Purge Supply Isolation Valves Failed their Leak Rate Test." This supplemental report provides the causes, additional corrective actions, and additional details in the Analysis of Event section, and revises the 10 CFR 50.73 reporting criteria.

Very truly yours,

A handwritten signature in black ink, appearing to read "M. Peckham".

Michael F. Peckham  
Plant Manager - Nine Mile Point 2

MFP/KLE/cld  
Attachment

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

IE22

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1)

Nine Mile Point Unit 2

DOCKET NUMBER (2)

05000410

PAGE (3)

01 OF 06

TITLE (4)

Primary Containment Purge Supply Isolation Valves Failed their Leak Rate Test

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 NUMBER(S)	
10	28	00	00	16	01	12	22	00	N/A		
									N/A		

OPERATING MODE (9)

1

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10) 25%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	(Specify in Abstract below and in Text, NRC Form 366A)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

Demetrius L. Willis, Manager Maintenance Unit 2

TELEPHONE NUMBER

(315) 349-7035

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
X	LK	ISV	F304	Yes	X	LK	ISV	F130	Yes
X	LK	ISV	F304	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)

NO

EXPECTED SUBMISSION DATE (15)

MONTH

DAY

YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On October 28, 2000, a mass flow leakage test performed on Primary Containment Purge Supply Valve 2CPS-V1, revealed that leakage past the valve exceeded the measurement capability of the test instrumentation. Based on the leak rate exceeding the capability of the test instrumentation, Niagara Mohawk Power Corporation concluded that the leakage past Valve 2CPS-V1 exceeded the primary containment leakage limits in Technical Specifications 3.6.1.1 and 3.6.1.2. Previously, the normal primary containment isolation valves, 2CPS\*AOV105 and 2CPS\*AOV107, were inoperable and Valve 2CPS-V1 was being used as primary containment boundary.

The causes of Valve 2CPS-V1 leakage failure were corrosion products on the seal and the seal over rotating beyond its normal setting position. The cause of Valve CPS\*AOV105 leakage failure was corrosion products on the seal. The causes of Valve 2CPS\*AOV107 leakage failure were the operators failing to close the valve and an inadequate design of the retaining device to prevent removal of the jackscrew on Bettis actuators.

Corrective actions include: repairing and testing Valves 2CPS-V1, 2CPS\*AOV105, and 2CPS\*AOV107; training operators on manual override of Bettis actuators; evaluating modifications to Bettis actuator stem retaining device; modifying procedures to perform local leak rate tests on containment vent and purge inlet valves each time they are closed to establish containment integrity; and evaluating alternate methods of depressurizing containment.

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TEXT CONTINUATION

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Nine Mile Point Unit 2	05000410	00	- 16	- 01	02 OF 06

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

## I. DESCRIPTION OF EVENT

On May 4, 2000, the inboard Primary Containment Purge Supply Isolation Valve 2CPS\*AOV107 failed to meet its Technical Specification Table 3.6.1.2-1 leakage requirement and was declared inoperable. On May 10, 2000, Valve 2CPS-V1, a manual resilient seal butterfly valve, was closed and satisfactorily tested, which provided the isolation boundary for primary containment and met the requirements of Technical Specification 3.6.1.2 and 3.6.1.7. This was necessary because Valve 2CPS\*AOV105 could not be periodically tested with Valve 2CPS\*AOV107 leaking.

In July 2000, Valve 2CPS-V1 was again satisfactorily tested. On September 9, 2000 and again on September 20, 2000, Valve 2CPS-V1 was manipulated to support the purging of the Suppression Chamber for planned and forced outages, respectively. Upon securing the purge system, Valve 2CPS-V1 was locked closed, but a leak rate test was not immediately performed.

During the October 20, 2000 leak rate test for Valve 2CPS-V1, the test had to be aborted due to high leakage past Valve 2CPS\*AOV105. On October 27, 2000, the actuator for Valve 2CPS\*AOV105 was removed and the valve was manually closed. After manually closing Valve 2CPS\*AOV105, the piping between Valves 2CPS-V1 and 2CPS\*AOV105 was pressurized. When a vent path was established, the indicated leakage went off scale high. As allowed by Technical Specification Tables 3.6.1.2-1 and 3.6.1.7, a testable blank flange was installed establishing primary containment integrity. On October 28, 2000, a mass flow leakage test was performed on Valve 2CPS-V1 to quantify the leakage. Again the leakage past the valve exceeded the measurement capability of the test instrumentation. Based on the leak rate exceeding the capability of the test instrumentation, Niagara Mohawk Power Corporation concluded that the leakage past Valve 2CPS-V1 exceeded the primary containment leakage limits in Technical Specifications.

During corrective maintenance on Valve 2CPS-V1, corrosion products were found on the seal and the seal was found over rotated beyond its normal setting position which prevented the disc and seal from forming a satisfactory boundary. The valve seal was replaced, and the valve was satisfactorily tested.

Troubleshooting of Valve 2CPS\*AOV107 revealed that the jackscrew had not been completely disengaged from the actuator during the valve restoration lineup following the integrated leak rate test. Subsequently, the jackscrew was disengaged from the spring assembly, and the valve was satisfactorily leak rate tested.

Troubleshooting of Valve 2CPS\*AOV105 revealed corrosion products on the seal which prevented the disc and seal from forming a satisfactory boundary. The seal was replaced, and the valve was satisfactorily leak rate tested.

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**I. DESCRIPTION OF EVENT (Cont'd)**

Niagara Mohawk Power Corporation management initially decided to postpone the repair of Valve 2CPS\*AOV107 based on a number of factors:

- The Technical Specifications allow using Valve 2CPS-V1 as a containment isolation valve.
- The successful local leak rate tests performed on Valve 2CPS-V1.
- The use of Valve 2CPS\*AOV105 as a pressure boundary during testing implied that the valve, even though pressurized in the non-accident direction, would provide an effective barrier to containment leakage.
- The existence of a contingency plan for the installation of a blank flange in the event Valve 2CPS-V1 failed the quarterly leak rate test.

In retrospect, management's failure to implement additional requirements for local leak rate testing to verify the continued integrity of the barrier provided by Valves 2CPS\*V1 and 2CPS\*AOV105 following valve operation during the Noble Metal Outage, and failure to consider the potential for common mode failure of both Valves 2CPS-V1 and 2CPS\*AOV105 implied by the prior failure of Valves 2CPS\*AOV104 and 2CPS\*AOV106 due to rust intrusion, ultimately allowed this event to occur.

Finally, had the problem with Valve 2CPS\*AOV107 been investigated during the Planned Outage in September, the problem with the valve (manually jacked open because of the engaged jackscrew) may have been discovered and the reliance on Valve 2CPS-V1 as a containment isolation barrier would have ceased.

**II. CAUSE OF EVENT**

The causes of Valve 2CPS-V1 leakage failure were corrosion products on the seal and the seal over rotating beyond its normal setting position. It is postulated that the high flow rates associated with the depressurization from the integrated leak rate test resulted in the migration of corrosion products to the containment purge supply inlet piping. Incorrect adjustment of the valve travel stops can allow the seal to over rotate and the as found position of the travel stops was not documented. The vendor manual on file is inadequate on how to adjust or verify that the travel stops are correctly set. Therefore, it is postulated that the inadequate vendor manual resulted in the seal being over rotated beyond its normal setting position.

The cause of Valve 2CPS\*AOV105 leakage failure was corrosion products on the seal. It is postulated that the high flow rates associated with the depressurization from the integrated leak rate test resulted in the migration of corrosion products to the containment purge supply inlet piping.

The causes of Valve 2CPS\*AOV107 leakage failure were the operators failing to close the valve and an inadequate design of the retaining device to prevent removal of the jackscrew on Bettis actuators. During the valve restoration lineup following the integrated leak rate test, the operators failed to ensure that the jackscrew was in the fully retracted position. Based on interviews, operators generally do not have

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**II. CAUSE OF EVENT (Cont'd)**

confidence that the retaining devices are able to stop stem travel when retracting the jackscrew due to the retaining devices breaking. A modification to the original design to incorporate stronger retaining pins would have prevented the recurrence of the broken retaining devices.

The cause of management's decision to postpone the repair of Valve 2CPS\*AOV107 was that the conditions and assumptions supporting the use of Valve 2CPS-V1 as a containment isolation valve were not maintained.

**III. ANALYSIS OF EVENT**

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i) which requires a report for any operation or condition prohibited by the plant's Technical Specifications. Technical Specification 3.6.1.1 requires primary containment integrity be maintained and Technical Specification 3.6.1.2 limits the primary containment leakage rates. Primary containment integrity was not maintained and the primary leakage rate for the penetration in question was greater than 3.75 scfh from September 20, 2000, when the Valve 2CPS-V1 was closed after inerting the Suppression Chamber, until October 27, 2000, when the testable blank flange was installed.

Downstream from the drywell and Valve 2CPS-V1, the piping branches into lines that exit outside secondary containment. These lines are isolated by a check valve, 2GSN-V86, and a manual valve, 2CPS-V26. These valves, 2GSN-V86 and 2CPS-V26, were leak rate tested with the downstream piping in both its normal configuration and vented. The leakage rates were 7.1 scfh and 5.8 scfh, respectively. Therefore, these valves would have limited the leakage through the penetration. The total primary containment leakage through valves and penetrations was 140.25 scfh, with an acceptance criterion of 494.64 scfh. Accordingly, adding 7.1 scfh to the total primary containment leakage would still be within the acceptance criteria.

The secondary containment bypass leakage limits are specified for each valve or penetration. The Technical Specification leakage limit for the penetration in question, is 3.75 scfh, and the measured leakage through Valves 2GSN-V86 and 2CPS-V26 was 3.35 scfh greater than the Technical Specification limit. Based on the additional leakage from the penetration, the dose consequences to the control room operators were still under the design limit of 30 rem thyroid (30 days after a loss of coolant accident), when using leak rate values closer to the actual leak rates.

Niagara Mohawk Power Corporation performed a probabilistic risk analysis for this condition and determined it is non-risk significant.

Based on the information provided above, there were no adverse safety consequences as a result of this event. Valve 2CPS-V1 leak rate test failure with Valves 2CPS\*AOV105 and 2CPS\*AOV107 inoperable did not pose a threat to the health and safety of the general public or plant personnel.

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**IV. CORRECTIVE ACTIONS**

1. A testable blank flange was installed establishing primary containment until the valves could be repaired.
2. Valves 2CPS-V1, 2CPS\*AOV105, and 2CPS\*AOV107 were repaired and tested satisfactorily during a plant outage in November 2000.
3. The stem retaining device for Bettis actuators will be evaluated for potential modification by February 23, 2001.
4. The proper operation of manual override and local verification of position for Bettis actuators will be incorporated into Operations initial and cycle training by May 31, 2001.
5. The method for depressurizing containment following completion of the Integrated Leak Rate Test will be reviewed for enhancements to eliminate or reduce the spread of debris in the Containment Purge Supply. The review will be completed by May 1, 2001.
6. The appropriate procedures will be modified to ensure that local leak rate tests are performed on containment vent and purge inlet valves each time they are closed to establish containment integrity. These modifications will be completed by March 15, 2001.
7. The vendor manuals for butterfly valves with resilient seals will be reviewed to ensure adequate guidance is provided to properly adjust travel stops by January 31, 2001.

**V. ADDITIONAL INFORMATION****A. Failed components:**

Component	Manufacturer	Model Number
Valves 2CPS*AOV107 and 2CPS*AOV105	Posi-Seal	12-inch Class 150
Valve 2CPS-V1	Fisher Controls	Series 9280

**B. Previous similar events:** None

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

**C. Identification of components referred to in this licensee event report:**

Components	IEEE 803A Function	IEEE 805 System ID
Primary Containment Purge Supply Isolation Valves	ISV	LK
Blank Flange	N/A	LK
Seal	SEAL	LK
Piping	N/A	LK
Jackscrew	N/A	LK
Spring	N/A	LK
Disc	N/A	LK
Valve	ISV	LK