

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9807160328 DOC.DATE: 98/07/08 NOTARIZED: NO DOCKET #
 FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
 AUTH.NAME AUTHOR AFFILIATION
 WARD, K. Niagara Mohawk Power Corp.
 DALBERG, K.A. Niagara Mohawk Power Corp.
 RECIPIENT NAME RECIPIENT AFFILIATION

SUBJECT: LER 98-018-00: on 980608, personnel determined that inboard MSIV on 'A' main steam line inoperable for period longer than allowed by TS. Caused by faulty SOV. Failed SOV replaced & all MSIV SOVs verified. W/980708 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 60
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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A04





NIAGARA MOHAWK

GENERATION
BUSINESS GROUP

NINE MILE POINT NUCLEAR STATION/LAKE ROAD, P.O. BOX 63, LYCOMING, NEW YORK 13093

July 8, 1998
NMP2L 1802

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

RE: Docket No. 50-410
LER 98-18

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii)(B), we are submitting LER 98-18, "Failure of Main Steam Isolation Valve to Close Due to Faulty Solenoid Valve."

Very truly yours,

Kim A. Dahlberg
Plant Manager - NMP2

KAD/TWP/kap
Attachment

xc: Mr. H. J. Miller, Regional Administrator, Region I
Mr. B. S. Norris, Senior Resident Inspector
Records Management

IE22/1

9807160328 980708 F
PDR ADDCK 05000410
S PDR L



LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 30.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20535, 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)

1 OF 5

TITLE (4)

Failure of Main Steam Isolation Valve to Close Due to Faulty Solenoid Valve

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)
06	08	98	98	018	00	07	08	98	N/A	05000
									N/A	05000

OPERATING MODE (9)

5

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

POWER LEVEL (10) 000	<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 checked="" 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)	<i>(Specify in Abstract below and in Text, NRC Form 366A)</i>
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

K. Ward, Technical Support Manager - NMP2

TELEPHONE NUMBER

(315) 349-1043

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIC
E	SB	PSV	ASCO	Y					

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 June 8, 1998, Nine Mile Point Unit 2 (NMP2) personnel determined that the inboard Main Steam Isolation Valve (MSIV) on the 'A' Main Steam Line (MSL) was inoperable for a period longer than allowed by the Technical Specifications (TS). It was determined that the fast-close solenoid operated valve (SOV) was failing to change position due to degradation of the Ethylene Propylene Diene Monomer (EPDM) seal material inside the valve. NMP2 was shutdown in refueling outage six (RFO6) at the time of discovery.

The immediate cause of the MSIV failing to close was a faulty SOV, which was sticking due to degradation of EPDM seal material in the plug-nut area of the SOV. The root cause of this event was determined to be inadequate corrective actions.

The failed SOV was replaced and all MSIV SOVs were verified to have viton seals. A review confirmed that no additional SOVs with EPDM seals were available in spare stock or shop areas. Procurement documents have been revised and Engineering documents which allow the use of the EPDM seal material in MSIV SOVs will be revised to allow the use of only SOVs with viton seals. A design change was implemented to monitor local temperature at the inboard and outboard MSIVs to validate SOV qualified life. The current corrective action process will prevent recurrence based on the requirements for documentation, and the levels of review and approval.



LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 30.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-430), 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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	05000410	98	18	00	02 OF 05

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

I. DESCRIPTION OF EVENT

On June 8, 1998, Nine Mile Point Unit 2 (NMP2) personnel determined that the inboard Main Steam Isolation Valve (MSIV6A) on the 'A' Main Steam Line (MSL) was inoperable for a period longer than allowed by the Technical Specifications (TS). It was determined that the fast-close Solenoid Operated Valve (SOV) was failing to change position due to degradation of the seal material inside the valve. NMP2 was shutdown in refueling outage six (RFO6) at the time of discovery.

The MSIVs, in normal operation, are held open by air pressure which is supplied by an air manifold that contains SOVs for controlling the air flow through the manifold to the MSIV actuator. The fast-close SOV operates in a normally energized state. This keeps the air on the MSIV actuator, which in turn, keeps the MSIV open. When voltage is removed from the SOV, the spring loaded SOV changes state and ports the manifold air off the actuator opening chamber, and then through air assistance, aids the spring pressure in the actuator, driving the MSIV valve disc into the seat and closing the MSIV.

During shutdown in preparation for a refueling outage, the MSIVs are normally fast-closed per procedure N2-OP-101C to test the isolation safety function. When control room operators attempted to fast-close the MSIVs, the control room indications showed that MSIV6A was still full open. The ammeters (for the solenoids) indicated zero current, confirming that the voltage for the SOVs had been removed and that all the MSIVs should have closed. All other MSIVs closed as designed.

The actuator for MSIV6A was visually inspected and was confirmed to be open. A slow-closure of the MSIV was performed to isolate the cause of the failure. MSIV6A closed as designed, which confirmed that the failure was likely to be in the fast-close SOV. Through a series of bench-tests and inspections, it was determined that the fast-close SOV had been sticking. The failed SOV and other SOVs were sent to an independent lab for analysis. The cause of the failure of the MSIV6A SOV (ASCO model NP8323A20E) was determined to be a breakdown of the Ethylene Propylene Diene Monomer (EPDM) seal material in the plug-nut area of the SOV due to temperature above the 250 degree F rating for EPDM. This information provided firm evidence that MSIV6A was rendered inoperable at some point during the operating cycle.

A review of vendor notices, NRC Bulletins and Information Notices (IN), Generic Letters, and other industry reports regarding SOV failures, including specific failures of ASCO NP8323A20E dual solenoid valves was performed. IN 88-43, issued in June 1988, focused entirely on ASCO NP8323 series valves, describing a variety of failures, including degradation of EPDM seals/seats in a high temperature environment. The IN reported independent laboratory results that showed failures in less than 30 days with valve body temperatures of 284 degrees F. The failed SOVs identified in the IN were equipped with both viton and EPDM seals. GE Service Information Letter (SIL) 481 was issued in February 1989, and described the factors that contributed to the malfunctioning of the ASCO SOVs and recommended methods for improving the reliability of MSIV closure. In November 1991, GE Nuclear Energy made a 10CFR Part 21 notification regarding these ASCO valves which reduced the qualified life of the valves from five years to 18 months.



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TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION
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RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY
COMMISSION, WASHINGTON, DC 20535, AND TO THE PAPERWORK REDUCTION PROJECT
(3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Nine Mile Point Unit 2	05000410	98	18	00	03 OF 05

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

I. DESCRIPTION OF EVENT (Cont'd)

Actions were taken by Niagara Mohawk Power Corporation (NMPC) to determine the appropriate corrective actions to resolve the issues surrounding the ASCO SOV deficiencies. As a result of IN 88-43, NMPC decided that it would replace its ASCO NP8323A20E valves every refueling outage in order to avoid the reliability problems experienced with the valves at other plants. ASCO SOVs with EPDM or viton seals were still considered to be interchangeable. A transition to a replacement ASCO SOV with viton seals was made and the problematic SOVs with the EPDM seals were no longer ordered. However, actions to adequately monitor the local temperature environment of the SOVs were not taken. The disposition of a Deviation/Event Report (DER) generated in 1991 assumed that all of the remaining spare stock of SOVs with EPDM seals would be used up during the 1992 refueling outage. The SOV that failed in MSIV6A was installed in 1996 and still contained EPDM seals.

II. CAUSE OF EVENT

The immediate cause of MSIV6A failing to close was a faulty SOV, which was sticking due to degradation of the EPDM seal material in the plug-nut area of the SOV.

The root cause of this event was determined to be inadequate corrective actions. Controls were not put in place to ensure that temperatures were adequately monitored in the local environment of the SOVs, or that replacement SOVs with viton seals were installed and the existing stock with EPDM seals was purged.

III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications," and in accordance with 10CFR50.73(a)(2)(ii), "Any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or that resulted in the nuclear power plant being: (B) In a condition that was outside the design basis of the plant." Firm evidence existed that the MSIV would not have performed its isolation function at some point during the operating cycle. The MSL was not isolated nor was the plant shutdown as required by the Technical Specifications. In addition, failure of the inboard MSIV to close concurrent with a MSL break outside primary containment or Loss of Coolant Accident (LOCA), and single failure of the outboard MSIV on the 'A' MSL would have resulted in exceeding 10CFR Part 100 and General Design Criteria (GDC) 19 radiological dose limits.



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TEXT CONTINUATION

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Nine Mile Point Unit 2	05000410	98	- 18	- 00	04 OF 05

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

III. ANALYSIS OF EVENT (Cont'd)

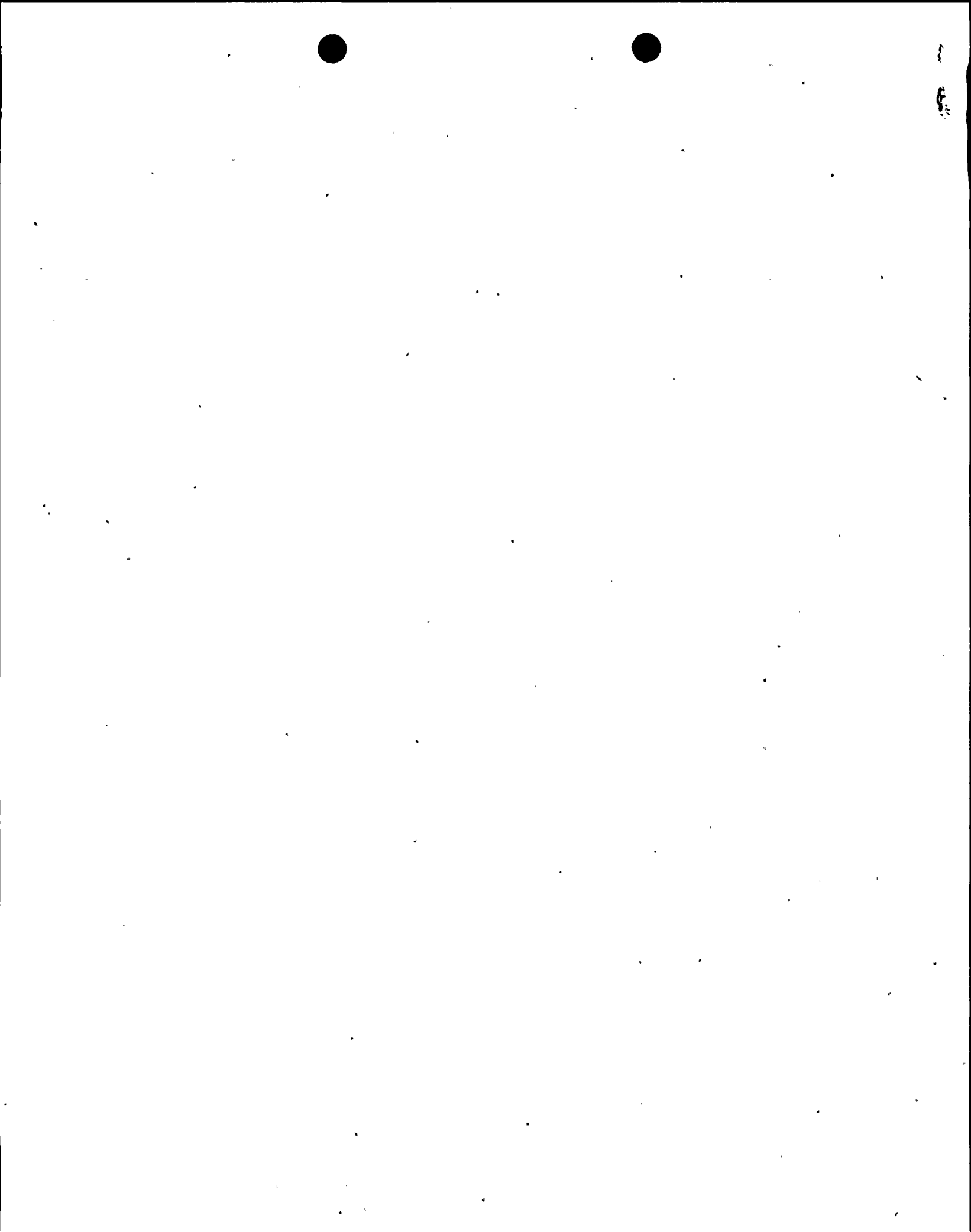
The initiating events of concern would be a MSL break downstream of the outboard MSIV or LOCA, and subsequent single failure of the outboard MSIV to close. With the inboard MSIV failing to close, this would result in an unisolable steam leak, either in the steam tunnel area or in the turbine building.

As noted above, design bases radiological dose limits would have been exceeded, if this scenario had occurred. Realistic analysis would postulate significantly less activity/being released due to minimal or no fuel damage. The outboard isolation valve on the 'A' MSL closed as designed, and thus would have isolated any postulated leak. The inboard valve (MSIV6A) was closed using the slow-closure test pushbutton. Although this pushbutton will not "seal-in" the valve in the closed position if the fast-closure SOV is still energized, it does provide a closure method. When MSIV6A was closed with this pushbutton, nitrogen to its accumulator was isolated and bled off to maintain the valve closed. Similar actions could have been taken to close the valve in an accident scenario. Although the drywell may not have been accessible to locally isolate the accumulator in an accident, nitrogen supply to the drywell can be isolated from the control room.

Emergency Operating Procedures (EOPs) provide the appropriate actions if a MSL fails to isolate and resultant radiation levels exceed acceptable limits. Adequate indications are available in the control room to identify this scenario. As noted above, the outboard MSIV operated as designed and closed during the plant shutdown and thus would have isolated the MSL on a MSL break or LOCA. Therefore, this event did not pose a threat to the health and safety of the public or plant personnel.

IV. CORRECTIVE ACTIONS

1. The failed SOV was replaced.
2. All MSIV SOVs were verified to have viton seals.
3. A review confirmed that no additional SOVs with EPDM seals were available in spare stock or shop areas.
4. Procurement documents have been revised to prohibit the use of SOVs with EPDM seals. Engineering documents which allow the use of the EPDM seal material in MSIV SOVs will be revised to allow only the use of SOVs with viton seals. This will be completed by August 15, 1998.
5. A design change was implemented to monitor local temperature at the inboard and outboard MSIVs. These temperatures will be used to validate SOV qualified life.
6. The current corrective action process will prevent recurrence based on the requirements for documentation, and the levels of review and approval.



LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		98	18	00		

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

V. ADDITIONAL INFORMATION

A. Failed components: Component Description: MSIV6A SOV
 Manufacturer: ASCO
 Model Number: NP8323A20E

B. Previous similar events: none.

C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 FUNCTION	IEEE 805 SYSTEM ID
Main Steam System	N/A	SB
Containment Isolation Control System	N/A	JM
Valve, Isolation	ISV	SB
Valve, Solenoid	PSV	SB
Seal	SEAL	SB



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