AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL
(TEMPORARY FORM)

CONTROL NO: 6280

FILE: MISC

FROM:	DATE OF DOC	DATE REC'D	LTR	TWX	RPT	OTHER
Northern States Power Co. Minneapolis, Minn L. O. Mayer	7-9-74	7-11-74	X			

TO:	ORIG	CC	OTHER	SENT AEC PDR	SENT LOCAL PDR
J. F. O'Leary		40		XXX	XXX

CLASS	UNCLASS	PROP INFO	INPUT	NO CYS REC'D	DOCKET NO:
	XXX			40	50-263

DESCRIPTION:

Ltr furn info re one of eight MSIV's tested failed to meet leakage limit.....

ENCLOSURES:

ACKNOWLEDGED
DO NOT REMOVE

PLANT NAME: MONTICELLO

FOR ACTION/INFORMATION 7 -16-74 GMC

BUTLER (L) W/ CYS	SCHWENCER (L) W/ CYS	✓ZIEMANN (L) W/7 CYS	REGAN (E) W/ CYS
CLARK (L) W/ CYS	STOLZ (L) W/ CYS	DICKER (E) W/ CYS	W/ CYS
[illegible] (L) W/ CYS	VASSALLO (L) W/ CYS	KNIGHTON (E) W/ CYS	W/ CYS
KNIEL (L) W/ CYS	PURPLE (L) W/ CYS	YOUNGBLOOD (E) W/ CYS	W/ CYS

INTERNAL DISTRIBUTION

✓REG FILE	TECH REVIEW	DENTON	LIC ASST	A/T IND
✓AEC PDR	✓HENDRIE	GRIMES	✓DIGGS (L)	BRAITMAN
✓OGC	SCHROEDER	GAMMILL	GEARIN (L)	SALTZMAN
✓MUNTZING/STAFF	✓MACCARY	KASTNER	GOULBOURNE (L)	B. HURT
✓CASE	✓KNIGHT	BALLARD	KREUTZER (E)	
GIAMBUSSO	✓PAWLICKI	SPANGLER	LEE (L)	PLANS
BOYD	✓SHAO		MAIGRET (L)	MCDONALD
MOORE (L)(LWR-2)	✓STELLO	ENVIRO	REED (E)	CHAPMAN
DEYOUNG (L)(LWR-1)	✓HOUSTON	MULLER	SERVICE (L)	DUBE w/input
SKOVHOLT (L)	✓NOVAK	DICKER	SHEPPARD (L)	E. COUPE
✓GOLLER (L)	✓ROSS	KNIGHTON	SLATER (E)	
P. COLLINS	✓IPPOLITO	YOUNGBLOOD	SMITH (L)	✓D. THOMPSON (2)
DENISE	✓TEDESCO	REGAN	TEETS (L)	✓KLECKER
✓REG OPR	✓LONG	PROJECT MGR	WILLIAMS (E)	✓EISENHUT
FILE & REGION (3)	✓LAINAS		WILSON (L)	
✓MORRIS	✓BENAROYA	HARLESS		
✓STEELE	✓VOLLMER			

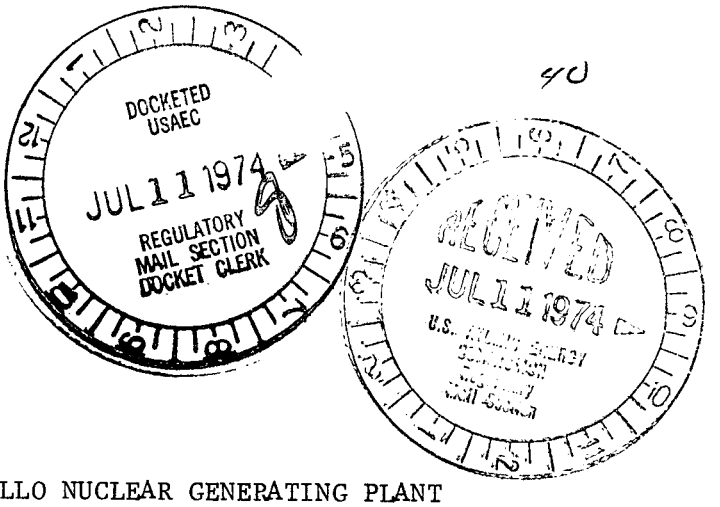
EXTERNAL DISTRIBUTION

✓1 - LOCAL PDR MINNEAPOLIS, MINN	(1)(2)(10)-NATIONAL LABS	1-PDR-SAN/LA/NY
✓1 - TIC (ABERNATHY)	1-ASLBP(E/W Bldg, Rm 529)	1-BROOKHAVEN NAT LAB
✓1 - NSIC (BUCHANAN)	1-W. PENNINGTON, Rm E-201 GT	1-G. ULRIKSON, ORNL
1 - ASLB	1-B&M SWINEBROAD, Rm E-201 GT	1-AGMED (RUTH GUSSMAN) Rm B-127 GT
1 - P. R. DAVIS	1-CONSULTANTS	
✓16 - ACRS SENT TO LIC ASST DIGGS 7-1 6-74	NEWMARK/BLUME/AGBABIAN	1-RD..MUELLER, Rm F-309 GT

NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401



July 9, 1974

40

Mr. J F O'Leary, Director
Directorate of Licensing
Office of Regulation
U S Atomic Energy Commission
Washington, DC 20545

Dear Mr. O'Leary:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Main Steam Isolation Valve Leakage and Closure Time

This report is submitted in accordance with paragraph 6.7.C.5 of the Appendix A Technical Specifications for the Monticello Nuclear Generating Plant. Paragraph 6.7.C.5 requires a report of main steam isolation valve (MSIV) leakage and closure times to be made 90 days after completion of MSIV leakage tests.

Table 1 is a summary of regularly scheduled MSIV surveillance testing at Monticello since our last report. Tests of automatic closure, closure times, partial exercising, and leakage testing are tabulated giving the number of valve tests conducted and number of discrepancies experienced. Table 2 is a detailed listing of the results of MSIV leakage tests conducted during the 1974 spring outage. Leakage before and after maintenance is given along with a summary of maintenance performed. Table 3 is a detailed listing of results of regularly scheduled MSIV timing tests at Monticello since our last report.

Main Steam Isolation Valve Leakage Measurements

One of the eight MSIV's tested failed to meet the 11.5 scfh leakage limit established by the Monticello Technical Specifications. The leakage rate past Inboard MSIV 2-80A was found to be 73.4 scfh. Examination showed that the main poppet was not mating properly with the valve seat. The main and pilot poppets received truing cuts and the main seat and pilot seat were lapped. Following corrective actions the leakage rate was reduced to less than 3.35 scfh.

During the Spring 1973 refueling outage, a similar problem was discovered on MSIV's 2-80A, 2-86A, and 2-86B. It is believed that low spots on MSIV seats have been the result of seat warpage which occurs when stresses in the valve body are relieved at operating temperatures. We believe that this phenomenon has now run its course (as evidenced by the reduced number of MSIV's

6280

exhibiting the problem during the Spring 1974 refueling outage) and that in the future the valves will demonstrate satisfactory leak tightness.

MSIV Closure and Exercise Tests

MSIV Air Operator Malfunctions

On February 16, 1974, two outboard MSIV's, 2-86B and 2-86C failed to close. The redundant MSIV's on the "B" and "C" steam lines were closed and the reactor was brought to hot standby condition while an investigation was conducted. It was found that the AC solenoids on the MSIV air operators were not venting properly when deenergized. The solenoid manifolds for 2-86B and 2-86C were disassembled and inspected. Metal chips, which could have prevented the solenoid plunger from repositioning properly, were found in the AC solenoid on the 2-86B manifold. No significant metal chips were found in the AC solenoid on the 2-86C manifold. The chips were the result of inadequate deburring and cleaning of the manifold during manufacture.

Further investigation revealed a generic design problem with the solenoid valves. It had been noted that the AC solenoids on the outboard MSIV's exhibited leakage through their exhaust ports. It was found that the viton seats in the solenoid plungers had assumed a permanent deformation. Leakage through the exhaust port could create a low pressure area across the top of the plunger, resulting in a force affecting plunger operation.

The solenoids and manifolds for all main steam isolation valves were disassembled and cleaned. New plungers with compensating top seats were installed in all AC MSIV solenoids upon recommendation of the vendor. These plungers will:

a) Compensate for wear on the top seat.

b) Provide additional spring force to assist plunger movement to the normally closed position.

In addition to new plungers in the AC solenoids, the following additional vendor recommended improvements to each MSIV air operator were made during the 1974 outage:

a) Replacement of the exercise valve with an operator which is not susceptible to exhaust port back pressure and removal of pressure relief valve in the exhaust port.

b) Removal of the exhaust restrictor and pressure relief valves on the 4-way valve. These valves were found to be unnecessary.

These modifications are now standard on all MSIV air operators supplied by the Automatic Valve Corporation. We believe that they adequately resolve all current problems and that the MSIV air operators will perform satisfactorily during the next operating cycle.

MSIV Yoke Rod Binding and Dashpot Oil

During routine testing on August 1, 1973, MSIV 2-80A closed in six seconds and on March 15, 1974, MSIV 2-80C closed in ten seconds. In each case it was found that the valve was slowed due to frictional resistance between the spring support yoke and the yoke rods. The pair of rollers attached to the top of the yoke were not riding on the yoke rods, thus allowing metal to metal contact during the valve closure stroke. Corrective maintenance included readjusting the rollers to obtain clearance between the yoke and the yoke rods, burnishing the galled areas on the yoke rods, and lubricating the contact areas between the rollers and the yoke rods.

In addition, the dashpot oil level in MSIV 2-80A was found to be low and the flow restrictor assembly air bound. The dashpot was filled and vented, allowing the MSIV to be satisfactorily stroked. The inboard "A" MSIV oil dashpot is particularly difficult to fill and vent since the valve is canted from the vertical plane in such a manner as to place the dashpot assembly at the low point. Successive exercises were necessary to adequately fill and vent the dashpot assembly. As an inspection of the oil level in the dashpot assemblies of the other MSIV's indicated no significant oil loss, it is believed that the dashpot assembly for MSIV 2-80A was not completely filled after maintenance during the 1973 outage. To further ensure an adequate amount of oil, a small reservoir was added to the dashpot external piping on all the MSIV's. Additionally, the MSIV maintenance procedure has been revised to provide assurance of proper alignment of the yoke and yoke rods as well as to ensure complete filling of the dashpot and flow restrictor assembly.

The potential for yoke rod binding is greater in MSIV's 2-80A and 2-80D which are canted along the nozzle axes approximately 45°. This places a side loading on the cam rollers used to guide the spring plate. The valve vendor has recommended rotating the operating assembly about the shaft axis to align the guide rollers with the vertical. The rotational increment is set by the number of bolts in the bonnet flange. There are five bolts per quadrant or 18° per bolt. To attain approximately 45° rotation, movement of 2 or 3 bolt locations is required. This modification was completed during the spring 1974 outage on MSIV 2-80A. MSIV 2-80D will be modified in a similar manner in conjunction with other required maintenance if operating experience indicates that MSIV 2-80A performs satisfactorily.

Dashpot Oil Restrictors

The flow restrictors originally supplied for the MSIV dashpots were highly throttled to achieve the 3-5 second MSIV closure times. Since these flow control valves were open less than 3% of full flow, any drift of the vernier knob could shut the restrictor and put a hydraulic lock on the MSIV or change its stroke time. During the 1974 spring outage all eight flow restrictors were

replaced with units equipped with a super sensitive wedge type needle and a locking vernier knob cap. The safety cap, lock nut, and lock wire feature of the replacement valve prevent inadvertent movement of the vernier knob. Additionally, the wedge type needle requires more opening to achieve the same restriction flow area. This results in a physically more repeatable adjustment less susceptible to drift. All other features of the replacement flow control valve are identical to the original valve.

We believe that the actions described adequately resolve all problems identified to date with main steam isolation valves at our Monticello facility. We will continue to closely follow the results of MSIV surveillance testing and initiate other modifications if they are indicated.

Yours truly,

L. O. Mayer

L O Mayer, PE
Director of Nuclear Support Services

LOM/DMM/kn

attachments

cc: J G Keppler
G Charnoff
Minnesota Pollution Control Agency
Attn. E A Pryzina

TABLE 1

Main Steam Isolation Valve Surveillance Testing
Requirements and Summary of Results (6/24/73 - 6/30/74)

Surveillance Test	Frequency	No. of Valve Tests Performed	No. of Test Discrepancies
MSIV Local Leak Rate Test (TS 4.7.A.2.e)	Each Operating Cycle	8	1
Test of simulated automatic closure (TS 4.7.D.1.a)	Each Operating Cycle	8	0
Trip test and measurement of closure times (TS 4.7.D.1.c (2))	Quarterly	64	4
Partial closure and reopening MSIV exercise (TS 4.7.D.2)	Weekly	320	0

TABLE 2

Results of Main Steam Isolation Valve Leakage Tests
Conducted During 1974 Spring Outage

Valve Identification	Leak Rate (SCFH) @ 25 PSIG		Summary of Maintenance Performed to Improve Leak Tightness
	As Found	As Left	
2-80A	73.4	3.35*	Truing cut made on main and pilot poppets. Main and pilot poppets lapped.
2-86A	4.75	-	Main and pilot poppets lapped.
2-80B	1.01	1.01	None
2-86B	3.52	3.52	None
2-80C	0.00	0.00	None
2-86C	3.88	3.88	None
2-80D	4.62	4.62	None
2-86D	5.08	5.08	None

* Indicates that combined inboard/outboard leak rate was determined.

TABLE 3

Results of Main Steam Isolation Valve
Quarterly Timing Tests (6/24/73 - 6/30/74)

Date	Time to Close in Seconds (3-5 seconds acceptable)							
	2-80A	2-86A	2-80B	2-86B	2-80C	2-86C	2-80D	2-86D
8/1/73	(6.0)	4.0	4.2	4.0	4.2	4.0	4.0	3.5
8/7/73	4.0	3.8	4.0	3.8	4.0	4.0	4.0	3.0
11/13/73	4.2	4.4	3.8	4.2	4.1	4.3	4.8	3.5
2/16/74	4.8	4.3	3.8	4.1	4.2	(*)	(*)	3.5
2/18/74	4.5	4.2	3.8	4.2	3.5	3.0	3.9	3.6
3/15/74	4.3	4.1	3.7	3.9	(10)	3.9	3.5	3.5
5/16/74	4.0	4.1	4.2	4.0	4.2	4.4	4.0	4.0
5/19/74	4.9	4.0	4.5	4.2	4.2	4.8	4.0	4.0

* Failure to close