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AUTH.NAME AUTHOR AFFILIATION  
DRESSEN,J.D. Wisconsin Public Service Corp.  
SCHROCK,C.A. Wisconsin Public Service Corp.  
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 93-003-00: on 930306, three MS valves found inoperable due to mechanical drift. Cause of event not been determined. Safety valves will be disassembled, rebuilt & tested. Supply to LER will be provided. W/930406 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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	AEOD/ROAB/DSP	2 2	NRR/DE/EELB	1 1
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	NRR/DRCH/HHFBHE	1 1	NRR/DRCH/HICB	1 1
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	NRR/DSSA/SRXB	1 1	<u>REG FILE</u> 02	1 1
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**WISCONSIN PUBLIC SERVICE CORPORATION**

600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

April 6, 1993

10 CFR 50.73

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305  
Operating License DPR-43  
Kewaunee Nuclear Power Plant  
Reportable Occurrence 93-003-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 93-003-00 is being submitted. This LER is being submitted 31 days after the event occurred. Our NRC Project Manager was informed of this on April 6, 1993.

Sincerely,

C. A. Schrock  
Manager-Nuclear Engineering

JDD

Attach.

cc - INPO Records Center  
US NRC Senior Resident  
US NRC, Region III

G:\WPFILES\LIC\NRC\LER5.WP

9304120058 930406  
PDR ADDCK 05000305  
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Handwritten initials "JDD" and the date "4/11".

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 0 5 1	PAGE (3) 1 OF 1 0
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TITLE (4)  
Three Main Steam Safety Valves Found Inoperable Due to Mechanical Drift

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)		
03	06	93	93	003	00	04	06	93	N/A			0 5 0 0 0		
												0 5 0 0 0		

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

OPERATING MODE (9) N	20.402(b)	20.408(a)	80.73(a)(2)(iv)	73.71(b)
	20.408(a)(1)(i)	80.38(c)(1)	80.73(a)(2)(v)	73.71(c)
	20.408(a)(1)(ii)	80.38(a)(2)	80.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.408(a)(1)(iii)	80.73(a)(2)(i)	80.73(a)(2)(viii)(A)	
	20.408(a)(1)(iv)	X 80.73(a)(2)(ii)	80.73(a)(2)(viii)(B)	
	20.408(a)(1)(v)	80.73(a)(2)(iii)	80.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Jay D. Dressen - Plant Nuclear Engineer	4 1 4 3 8 8 - 2 5 6 0

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
X	S	B	R	V					
			D	2	4	3			YES

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
		0 5	1 6	9 3

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

On March 6, 1993, with the plant in hot shutdown for the 1993 refueling outage, Surveillance Procedure 06-077, Main Steam Safety Valve Test" was performed. During the performance of the procedure it was discovered that the lift pressure of three of the ten main steam (MS) safety valves was out of tolerance, and hence, were declared inoperable.

The three inoperable MS valves will be disassembled, rebuilt and tested before exceeding hot shutdown after the 1993 refueling outage. The cause of the safety valve failure will be investigated further when the valves have been disassembled. A supplement to this LER will be provided to report the results of that investigation.

Sufficient pressure relieving capability existed to ensure the health and safety of the public at all times through a combination of the relieving capability of the MS safety valves and the non-safety related steam relief capabilities of the system.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Description of Event

On March 6, 1993, with the plant in hot shutdown for the 1993 refueling outage, Surveillance Procedure (SP) 06-077, "Main Steam Safety Valve Test," was performed. During the performance of SP 06-077 the lift pressure of three of the ten main steam (MS) safety valves was found to be out of tolerance, hence, the valves were declared inoperable.

In accordance with the IST plan, two of the ten MS safety valves are selected each year to be tested. MS safety valves SD1A3 and SD1A4 were scheduled to be tested during the 1993 refueling outage. SP 06-077 requires that the as found lift pressure be recorded and meet two criteria, the test acceptance criterion and the set pressure acceptance criterion.

The test acceptance criterion is a wide band of -3 percent and +2 percent of the valve's nominal setpoint. Valves with lift pressures within this range are considered operable since they demonstrated acceptable performance within an analyzed range. If the as found lift pressure is outside of the test acceptance criterion the valve is considered inoperable.

The set pressure acceptance criterion is a narrower band of ±1 percent of the nominal set point. If the lift pressure is within this band on two consecutive tests the valve may be returned to service. If a valve's as found lift pressure is outside of the set pressure acceptance criterion, but within the test acceptance criterion the valve is considered operable but must be adjusted and tested prior to returning it to service.

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

There are five MS safety valves for each steam generator (SG), SD1A1 through SD1A5 and SD1B1 through SD1B5. These valves are used to protect the 1A and 1B SGs from overpressurizing following certain postulated upset conditions. They are located outside of containment on the respective 30 inch MS headers (reference figure 1). The five safety valves for each SG are set to relieve at 1074, 1090, 1105, 1120 and 1127 psig, respectively. The total combined relieving capacity of all 10 safety valves is 7.71E+6 lb/hr at 1160 psig. The maximum full power steam flow at 1721 MWTH (104 percent of licensed power) is 7.45E+6 lb/hr; therefore, the main steam safety valves can relieve the total maximum steam flow if necessary.

When the MS safety valves are tested, steam line pressure is between 900 and 1000 psig. A hydroset is used to increase pressure to the lift setpoint of the valve being tested. The pressure from the hydroset and the steam line pressure is then added to determine the lift setpoint of the valve. If a valve's lift set point does not meet the test acceptance criterion, the following steps are required:

1. The group supervisor and shift supervisor shall be notified immediately.
2. A Surveillance Procedure Exception Report, an Incident Report and a work request shall be written.
3. The valve shall be repaired or replaced.
4. Two additional valves must also be tested and if the set pressure of either of the two additional valves falls outside of the test acceptance criterion, all remaining MS safety valves shall be tested.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

During the 1993 refueling outage, MS safety valves SD1A3 and SD1A4 were selected to be tested and rebuilt in accordance with SP-06-077. When the valves were tested, SD1A4 was found to be within the set pressure criterion, and SD1A3 was found to be outside of the test acceptance criterion. Because SD1A3 was found to be outside of the acceptance criterion, two additional valves, SD1A5 and SD1A2, were chosen to be tested.

When SD1A5 was found to be outside of the test acceptance criterion, all the remaining valves required testing.

Safety valve SD1A2 was tested next. During the testing of SD1A2 a noticeable precalibrated zero shift was noted on the pressure gauge used to measure the hydroset pressure. Due to the zero shift, a calibration check was performed on the gauge and it was found to be reading 50 psig low. Because the gauge was reading 50 psig low there were concerns of the gauge's accuracy during the previous tests. It should be noted that this gauge was calibrated prior to performance of SP-06-077, in accordance with standard KNPP practices.

When the pressure gauge was replaced, valve SD1A1 was tested and the actuation pressure was within the set pressure acceptance criterion, reference table 2. Safety valves SD1B1 through SD1B5 were tested next.

When safety valves SD1B1 through SD1B5 were tested, SD1B4 was found to be within the set pressure acceptance criterion. Valves SD1B3 and SD1B5 were operable but needed setpoint adjustment. Valves SD1B1 and SD1B2 were found to be outside of the test acceptance criterion and were declared inoperable.

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

Because the data obtained from testing SD1A2, SD1A3, SD1A4 and SD1A5 was considered to be in question, due to an inaccurate pressure gauge, it was decided to retest these valves. When valves SD1A2, SD1A3, SD1A4 and SD1A5 were retested, SD1A2 and SD1A4 met the set pressure acceptance criterion. Valve SD1A3 was operable but needed a setpoint adjustment. Valve SD1A5 was found to be outside of the test acceptance criterion, reference table 2.

The valves which met the set pressure acceptance criteria, SD1A1, SD1A2 and SD1B4, do not require repair or further testing. The valves which were found to be outside of the set pressure acceptance criteria but inside the test acceptance criterion, SD1B3 and SD1B5, will be adjusted to be within the set pressure acceptance criteria before exceeding hot shutdown from the 1993 refueling outage. The valves which failed, SD1A5, SD1B1 and SD1B2, will be disassembled, rebuilt and tested to ensure they are within the set pressure criterion prior to exceeding hot shutdown after the 1993 refueling outage. Because SD1A3 and SD1A4 were scheduled to be tested during the 1993 refueling outage they will be rebuilt and verified to be within the set pressure acceptance criterion prior to exceeding hot shutdown.

Cause of Event

The cause of valves SD1A5, SD1B1 and SD1B2 to fail the surveillance test has not been determined. These valves will be disassembled, rebuilt and tested later in the 1993 refueling outage. The results of the rebuild will be supplied in a supplement to this LER.

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

Analysis of Event

This event is reportable in accordance with 50.73(a)(2)(ii)(B) as a condition that was outside the design basis of the plant. This event was also reported in accordance with 10CFR50.72(b)(2)(i) at 1239 on March 6, 1993.

A review of the KNPP Updated Safety Analysis Report (USAR) indicates that the MS safety valves are needed to mitigate the following accidents: RCP Locked Rotor, Loss of Load, Loss of Feedwater, Uncontrolled Rod Withdrawal, SG Tube Rupture and the Anticipated Transient Without Scram. The review concluded that the main steam isolation valves are not required to isolate for the accidents mentioned above. Because the MS isolation valves do not actuate there is a high level of confidence that the steam dump system would be able to perform its function and relieve SG pressure (reference figure 1).

The steam dump system is designed for the turbine generator to accept a load rejection from 100 percent power to approximately 5 percent power without a reactor trip. The design capacity of the SD system is 85 percent of the plant design steam flow at 100 percent power. There are six condenser steam dump valves, three for each SG, with a relieving capacity of 3.00E6 lb/hr, or 40 percent of maximum calculated steam flow. There are also six atmospheric steam dump valves, three for each SG, with a relieving capacity of 3.37E6 lb/hr, or a total capacity of 45 percent of maximum calculated steam flow at 735 psig SG pressure.

The total relieving capacity of the steam dump system is 6.37E6 lb/hr at 735 psig. With three SG safety valves inoperable, SD1B1, SD1B2 and SD1A5, which are capable of relieving 2.30E6 lb/hr, the



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

steam dump system would have been able to relieve the SG pressure and allow operators to bring the plant to a safe shutdown condition without any threat to the health and safety of the public.

There are also two power operated relief valves, one on each MS header, upstream of the MS isolation valves (reference figure 1). These valves are used to minimize safety valve operation during small pressure excursions. Each valve has a relieving capacity of 3.72E5 lb/hr at 1050 psig. These valves are automatically set to relieve at 1050 psig, which is below the lowest setpoint of the SG safety valves. These valves would be relieving pressure before the SG safety valves would open, thus further enhancing the pressure relieving capabilities.

A hydrostatic test was performed on the secondary side of the SGs during construction. The test was performed at 1360 psig. The three valves which were inoperable would have actuated well before the pressure would have increased to 1360 psig. The ten SG safety valves were available to maintain SG pressure below the test pressure, therefore the SG would not have overpressurized beyond a pressure that it has been tested to.

Corrective Actions

Safety valves SD1A5, SD1B1 and SD1B2 will be disassembled, rebuilt and tested before starting up after the 1993 refueling outage. The cause of the safety valves to fail may be determined when the valves are disassembled. A supplement to this LER will be provided after the work is completed.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

Additional Information

Equipment Failure: Dresser Industrial Valve and Equipment, Model number 6-3787A-X1-RT-21-XLP1 Safety valve.

Similar Events: None.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

TABLE 1  
TEST DATA BEFORE REPLACING FAULTY PRESSURE GAUGE

VALVE	TEST #	SETPOINT	SET PRESSURE ACCEPTANCE CRITERIA (±1%)	TEST ACCEPTANCE CRITERIA (-3%,+2%)	ACTUATION PRESSURE	STATUS
SD1A4	1 2 3	1105	1094-1116	1072-1127	1121 1095 1104	OPERABLE
SD1A3	1 2	1074	1053-1074	1042-1095	1099 1068	INOPERABLE
SD1A5	1 2	1127	1116-1138	1093-1145 <sup>(1)</sup>	1148 1118	INOPERABLE
SD1A2	1 2 3	1090	1079-1101	1057-1112	1077 1058 1053	INOPERABLE

TABLE 2  
TEST DATA AFTER REPLACING FAULTY PRESSURE GAUGE

VALVE	TEST #	SETPOINT	SET PRESSURE ACCEPTANCE CRITERIA (±1%)	TEST ACCEPTANCE CRITERIA (-3%,+2%)	ACTUATION PRESSURE	FINAL STATUS
SD1A1	1 2	1120	1109-1131	1086-1143	1130 1127	OPERABLE
SD1B1	1	1127	1116-1138	1093-1145 <sup>(1)</sup>	1217	INOPERABLE
SD1B2	1 2	1105	1094-1116	1072-1127	1187 1125	INOPERABLE
SD1B3	1 2	1074	1053-1074	1042-1095	1080 1080	OPERABLE ADJUSTMENT NEEDED
SD1B4	1 2 3	1090	1079-1101	1057-1112	1107 1086 1090	OPERABLE
SD1B5	1 2 3	1120	1109-1131	1086-1143	1143 1109 1099	OPERABLE ADJUSTMENT NEEDED
SD1A5	1 2 3	1127	1116-1138	1093-1145 <sup>(1)</sup>	1134 1139 1147	INOPERABLE
SD1A4	1 2 3	1105	1094-1116	1072-1127	1123 1115 1113	OPERABLE
SD1A3	1 2 3	1074	1053-1074	1042-1095	1089 1086 1089	OPERABLE ADJUSTMENT NEEDED
SD1A2	1 2 3	1090	1179-1101	1057-1112	1104 1087 1096	OPERABLE

<sup>(1)</sup> THESE VALVES LIMITED TO +1.6% BASED ON SG DESIGN PRESSURE

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

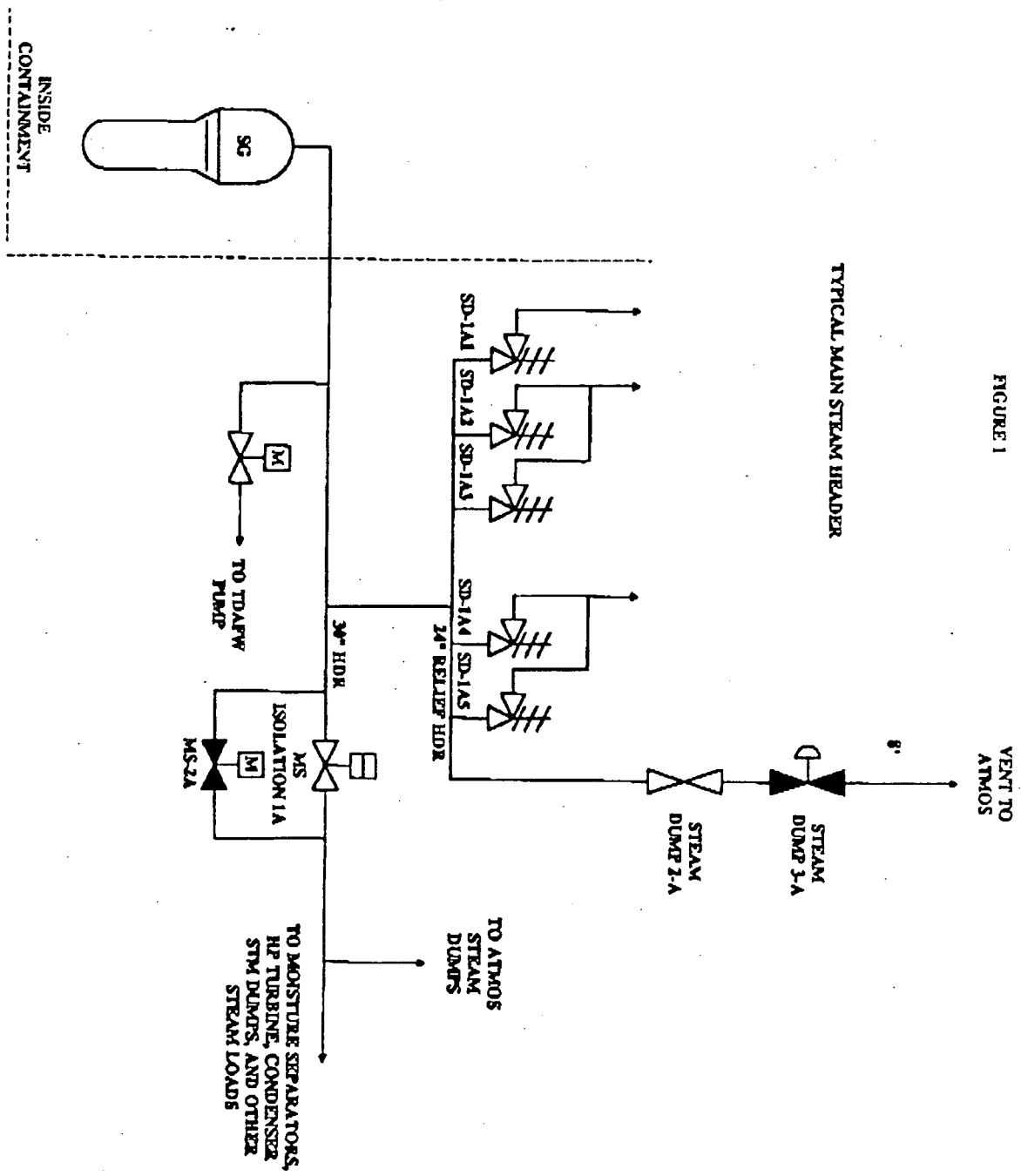


FIGURE 1