Niagara Mohawk

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June 5, 2000
NMP1L 1519

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

RE: Docket No. 50-220
Licensee Event Report 00-02

Gentlemen:

In accordance with 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73(a)(2)(vii)(B) we are submitting Licensee Event Report 00-02, "Service Water Check Valves Fail Reverse Flow Test."

Very truly yours,

John T. Conway

John T. Conway
Vice President, Nuclear Generation

MFP/KLE/tmk
Attachment

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

IE22

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES:

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)	DOCKET NUMBER (2)	PAGE (3)
Nine Mile Point Unit 1	05000220	01 OF 06

TITLE (4) Service Water Check Valves Fail Reverse Flow 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)
05	05	00	00	02	00	06	05	00	N/A	
									N/A	

OPERATING MODE (9): 4

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

POWER LEVEL (10): 000

- ☐ 20.2201(b)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)
- ☐ 50.36(c)(2)
- ☐ 50.73(a)(2)(i)
- ☐ 50.73(a)(2)(ii)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)
- ☒ 50.73(a)(2)(v)
- ☒ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71
- ☐ OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Stephen T. Doty, Manager Maintenance - Unit 1	(315) 349 - 4594

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO EPIX
E	BI	ISV	Chapman	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐ YES *(If yes, complete EXPECTED SUBMISSION DATE)*	☒ NO				

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

On May 5, 2000, with the Nine Mile Point Unit 1(NMP1) plant in the cold shut down condition, Service Water check valves 72-21 and 72-22 failed to meet the reverse flow testing criteria of procedure N1-ST-V14, "Service Water Check Valve and Emergency Service Water Pump and Check Valve Test," which is part of the Inservice Testing Program. Emergency Service Water was declared inoperable and the plant entered the action statement of Technical Specification 3.4.5 for the control room air treatment system. The failure of the valves was entered into the corrective action process for evaluation and efforts to repair the valves were initiated in the work control process. On May 7, 2000, work orders that cleaned the pivot pins, bearing caps and packing collars and repacked the valves were completed. The valves were then successfully tested in accordance with procedure N1-ST-V14, Emergency Service Water was declared operable and the plant exited the action statement of Technical Specification 3.4.5.

The cause of the surveillance test failure was inadequate preventive maintenance.

Check valves 72-21 and 72-22 were cleaned, repacked and successfully reverse flow tested. These valves were added to the Preventive Maintenance / Surveillance Test database for inspection, cleaning and packing replacement at a four-year interval. Niagara Mohawk Power Corporation will review the preventive maintenance activities for all the check valves contained in the NMP1 Check Valve Program Plan, by August 28, 2000, to ensure adequate preventive maintenance is performed.

I. DESCRIPTION OF EVENT

On May 5, 2000, with the Nine Mile Point Unit 1(NMP1) plant in the cold shutdown condition, Service Water check valves 72-21 and 72-22 failed to meet the reverse flow testing criteria of procedure N1-ST-V14, "Service Water Check Valve and Emergency Service Water Pump and Check Valve Test," which is part of the Inservice Testing Program. Emergency Service Water was declared inoperable and the plant entered the action of Technical Specification 3.4.5 for the control room air treatment system. The failure of the valves was entered into the corrective action process for evaluation and efforts to repair the valves were initiated in the work control process. Check valves 72-21 and 72-22 are Chapman 20 inch model 23-FE valves. On May 7, 2000, work orders that cleaned the pivot pins, bearing caps and packing collars and repacked the valves were completed. The valves were then successfully tested in accordance with procedure N1-ST-V14. The Emergency Service Water System was declared operable and the plant exited the action statement of Technical Specification 3.4.5.

The Service Water system has two loops, loop 11 and loop 12. Each loop is normally supplied by a non-safety related Service Water pump and is composed of a safety related and non-safety related portion. The safety related portion of loop 11 is supplied by Emergency Service Water pump 11 and the safety related portion of loop 12 is supplied by Emergency Service Water pump 12. Check valve 72-21 is used to isolate the safety related from the non-safety related portion of loop 12 and check valve 72-22 is used to isolate the safety related from the non-safety related portion of loop 11. During normal operation, these check valves are open with continuous Service Water flow through them (refer to the attached diagram). In the event of a loss of both normal and reserve AC power, the Service Water pumps would be unavailable and the Emergency Service Water pumps, which have emergency power sources, would be manually started to provide cooling water to the safety related portion of the Service Water system. The Reactor Building Closed Loop Cooling Water (RBCLCW) system heat exchangers are the essential loads on the safety related portion of the Service Water system. Check valves 72-21 and 72-22 are required to close to ensure that Emergency Service Water flow is not diverted to the non-safety related portion of the Service Water system. The essential heat loads cooled by the RBCLCW system are; Spent Fuel Cooling, Control Room Air Conditioning, Instrument Air and Feedwater/High Pressure Core Injection. Prior to their unsuccessful reverse flow test on May 5, 2000, the check valves had been successfully reverse flow tested on October 10, 1999.

II. CAUSE OF EVENT

The cause of the surveillance test failure was inadequate preventive maintenance.

III. ANALYSIS OF EVENT

The reverse flow test failure of Emergency Service Water check valves 72-21 and 72-22 is reportable in accordance with 10 CFR 50.73(a)(2)(v), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (B) Remove residual heat"; and 10 CFR 50.73(a)(2)(vii), "Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to: (B) Remove residual heat." The purpose of check valves 72-21 and 72-22 is to close to prevent Emergency Service Water from being diverted to the non-safety related portions of the Service Water system if the normal Service Water system should become unavailable. With check valves 72-21 and 72-22 failing to meet their reverse flow acceptance criteria, if a condition had existed requiring Emergency Service Water, a portion of the flow would have been diverted to the non-safety related portion of the Service Water system. Based on engineering judgement and a coping analysis, it cannot be conclusively determined that the residual heat removal function would have been sustained. This event is, therefore, being reported by conservatively assuming that the function would have been lost.

An assessment of the safety consequences of this event concluded that it did not pose a threat to the health and safety of the public or plant personnel. The assessment included consideration of the plant conditions at the time of the failure and the availability of Service Water and the impact of the loss of Emergency Service Water on essential loads of the RBCLCW system. Also included were the Special Operating Procedures (SOPs) that would be implemented as a result of losing Service Water and Emergency Service Water and the Probabilistic Risk Analysis of the impact of losing Service Water and Emergency Service Water.

During the period from the last successful reverse flow test of check valves 72-21 and 72-22 until the failure of the reverse flow test, there were no losses of Service Water that would have presented the need for the Emergency Service Water system. Additionally, Service Water was available during the period that Emergency Service Water was considered inoperable because of the failed reverse flow test of the check valves.

A total loss of Emergency Service Water results in a loss of Feedwater/High Pressure Core Injection, spent fuel pool cooling, control room air conditioning and instrument air. An analysis was conducted to assess the impact on these essential loads and to provide any time constraints associated with restoration. Failure of the Feedwater/High Pressure Core Injection pump function was conservatively assumed with the loss of Emergency Service Water. No time constraint is associated with Feedwater/High Pressure Core Injection since other means of residual heat removal are available. Core Spray, Containment Spray and Emergency Cooling operation is not impacted by a loss of Emergency Service Water. The calculated time-to-boil in the spent fuel pool is approximately 42 hours. Approximately 8 hours after a loss of air conditioning the Control Room is at a calculated temperature of 95 degrees. These time frames are sufficient to allow operators to reestablish the Emergency Service Water and RBCLCW function. The most limiting time constraint is associated with the loss of instrument air. Using design basis information and engineering judgement it is believed that instrument air would be available for 30 minutes after a loss of Emergency Service Water. This provides time for diagnosis and mitigating action. However, if instrument air is lost, the updated FSAR Safety Analysis, Section XV.3.22

III. ANALYSIS OF EVENT (Cont'd)

demonstrates that the loss of all instrument air will permit the safe shutdown of the plant, though it may place the plant in unnecessary transients that require operator action for recovery. Additionally, a coping analysis has been performed that assumes a Design Basis Accident concurrent with a loss of RBCLCW. This beyond design basis analysis also determined that safe shutdown can be achieved.

An assessment of the SOPs that would be implemented following a loss of Service Water was conducted. SOPs are available for the loss of Service Water, loss of RBCLCW, loss of spent fuel pool cooling and loss of instrument air. Additionally, RBCLCW temperature indication and annunciation in the control room would alert operators to problems in RBCLCW. The loss of Service Water and loss of RBCLCW SOPs direct securing equipment which reduce heat loads, reduce the heatup rate in RBCLCW and protect the equipment from damage associated with loss of cooling. Although, not directed by any SOP, manual isolation valves are available to isolate check valves 72-21 and 72-22 and manual levers on each check valve could also be used to attempt to close the valve.

A Probabilistic Risk Analysis of the impact of the failure of check valves 72-21 and 72-22 to close, that considered the guidance in the SOPs and operator action, concluded that the impact was of very low risk significance. The guidance in the SOPs that directs securing equipment is reflected in the recovery actions of the Probabilistic Risk Analysis associated with the loss of Service Water.

IV. CORRECTIVE ACTIONS

1. The pivot pins, bearing caps and packing collars of check valves 72-21 and 72-22 were cleaned and reassembled with new packing.

2. The reverse flow test procedure N1-ST-V14 was performed successfully.

3. Check valves 72-21 and 72-22 were added to the Preventive Maintenance / Surveillance Test database for inspection and cleaning and packing replacement at four year intervals.

4. Niagara Mohawk Power Corporation will review the preventive maintenance activities for all the check valves contained in the NMP1 Check Valve Program Plan to ensure adequate preventive maintenance is performed. This review will be completed by August 28, 2000.

VI. ADDITIONAL INFORMATION

A. Failed Components: Check Valves CKV-72-21 and CKV-72-22
Component description: 20 inch check valve lever operated
Manufacturer: Chapman Valve Mfg. Co
Model Number: 20 inch Chapman List 23-FE

B. Similar Events: none

C. Identification of components referred to in this LER:

Component	IEEE 803A Function	IEEE 805 System ID
Service Water System	N/A	BI
Reactor Building Closed Loop Cooling System	N/A	CC
Feedwater System	N/A	SJ
High Pressure Core Injection	N/A	BJ
Spent Fuel Pool Cooling	N/A	DA
Control Room Air Conditioning	ACU	VI
Instrument Air System	N/A	LD
Temperature Indicator	TI	CC
Emergency On Site Power	N/A	EK
Valve	ISV	BI
Pump	P	BI, SJ, BJ
Annunciator	ANN	CC

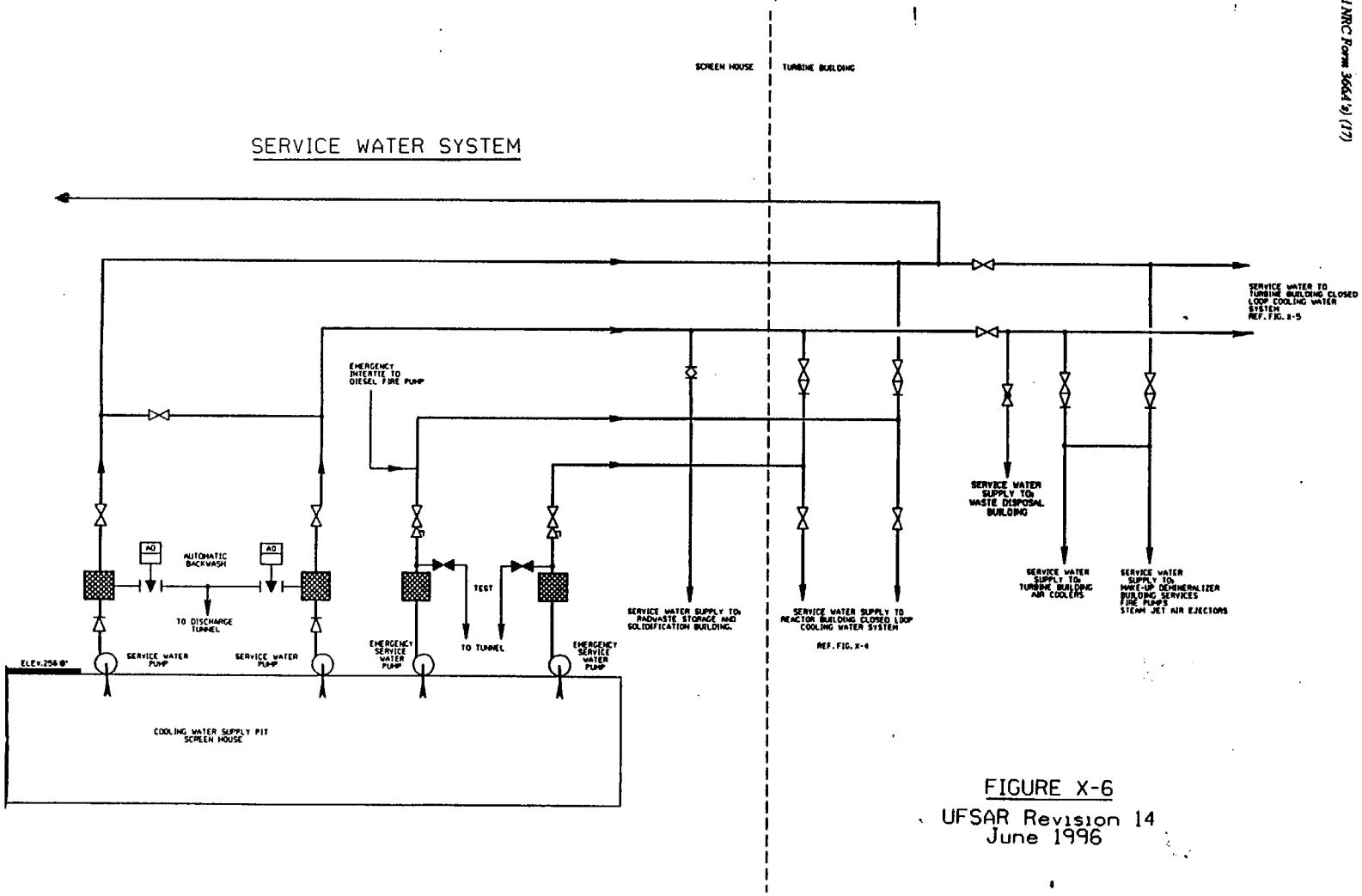

FIGURE X-6
UFSAR Revision 14
June 1996