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July 14, 1986

Mr J G Keppler
Regional Administrator - Region III
US Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Response to IE Bulletin 85-03

The attached information is offered in response to Item (e) of IE Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings." Results of Item (a) are included, as are the program to accomplish Items (b) through (d) and a schedule for completion of these items.

Please contact us if you have any questions about this response.

C E Larson

C E Larson
Vice President Nuclear Generation

CEL/EFE/dab

c: NRR Project Manager, NRC
Resident Inspector, NRC
Document Control Desk, NRC
G Charnoff

Attachment

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket No. 50-282
50-306

RESPONSE TO IE BULLETIN 85-03

Northern States Power Company, a Minnesota corporation, by this letter dated July 14, 1986 hereby submits the response to IE Bulletin 85-03 for the Prairie Island Nuclear Generating Plant.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By C E Larson
C E Larson
Vice President, Nuclear Generation

On this 14th day of July, 1986 before me a notary public in and for said County, personally appeared C E Larson, Vice President, Nuclear Generation, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

Dody A Brose

DODY A. BROSE
NOTARY PUBLIC — MINNESOTA
HENNEPIN COUNTY
My Commission Expires Dec. 26, 1989

RESPONSE TO IE BULLETIN 85-03, ITEM (e)

I. HIGH PRESSURE SAFETY INJECTION SYSTEM

A. Definition - Safety injection pump suction from the boric acid storage tank and/or the refueling water storage tank discharging to the reactor coolant system via the reactor vessel injection and/or cold leg injection lines. The high pressure safety injection system does not include the accumulator injection lines, the residual heat removal system nor the recirculation from the containment sump.

B. Valve Selection

1. Safety injection pump suction

a. From boric acid storage tank (2 valves)

b. From refueling water storage tank (2 valves)

c. Common pump suction (2 valves)

2. Safety injection pump discharge to the reactor vessel. Safety injection pump discharge to the cold leg valves are not considered in the evaluation because Technical Specifications require these values to be open with their associated motor control center supply breakers locked open.

II. AUXILIARY FEEDWATER SYSTEM

A. Definition

1. Auxiliary feedwater pump suction from the condensate storage tanks and/or the cooling water system discharging to the steam generators.

2. Steam supply from the steam generators to the turbine driven auxiliary feedwater pump.

B. Valve Selection

1. Auxiliary feedwater pump suction.

a. From condensate storage tank (2 valves).

b. From cooling water system (2 valves).

2. Auxiliary feedwater pump discharge to steam generator (4 valves).

3. Turbine driven auxiliary feedwater pump steam supply from the steam generators (2 valves).

III. VALVE DIFFERENTIAL PRESSURE DESIGN BASIS

A. System parameter evaluation (maximum pressure producing capability).

1. Pumps

a. Operating - maximum discharge head.

b. Not operating.

2. Relief valves - set pressure plus ASME allowable deviation.

3. Piping

a. Elevation changes only considered with valves at the low points of systems to increase the maximum differential pressure.

b. Piping line breaks downstream or upstream of valve.

4. Check valves

a. Short term - no significant back leakage.

b. Long term - leakage across disc sufficient to equalize pressure on either side of disc.

5. Tanks

a. Elevation Head

b. Design pressure

6. Systems

a. Reactor coolant system design pressure

b. Steam generator design pressure

7. Valves

a. Valves required to be locked open by Technical Specifications are assumed to be in the correct position.

b. Class 1E valve electrical interlocks are assumed to be operable.

c. Globe valves are evaluated using the elevated pressure downstream of the valve in the close to open cycle and elevated pressure upstream of the valve in the open to close cycle. These assumptions preclude system pressure from assisting the actuator to open or close the valve and are considered to be very conservative.

B. Evaluation Assumptions

1. Per the guidance in item (a) of the bulletin, multiple valve mispositioning to cause an elevated ΔP across another valve was not considered in the evaluation.

2. Multiple check valve back-leakage is possible to cause a ΔP across a closed upstream valve. Multiple check valve leakage cannot cause significant ΔP across an open upstream valve (i.e. - gross check valve leakage is not plausible).

3. Valves not desired to be operable/opened against a ΔP higher than their design ΔP need only be operable at their design ΔP.

4. Similarity of Unit 1 and Unit 2 piping (i.e. valve location, pump sizes, relief valve setting) does not warrant independent evaluations for each unit.

5. Motor valves are evaluated in their safeguards actuation mode(s) and not for operations convenience modes. For example, the Safety Injection Pump suction from the RWST is not being evaluated when it is being used as a drainage path for the refueling cavity.

TABLE 1

VALVE IDENTIFICATION AND DIFFERENTIAL PRESSURES

VALVE(S)	VALVE ACTUATOR	FUNCTION	IEB 85-03 EVAL ΔP (MAX)	ORIGINAL DESIGN ΔP
MV-32081 MV-32082 MV-32184 MV-32185	Limitorque SMB-00 3550 rpm	Safety Injection Pump(s) Suction from Boric Acid Storage Tank	32½ psi	200 psi
MV-32079 MV-32080 MV-32182 MV-32183	Limitorque SMB-0 3550 rpm	Safety Injection Pump(s) Suction from Refueling Water Storage Tank	32½ psi	100 psi
MV-32162 MV-32163 MV-32190 MV-32191	Limitorque SMB-00 3550 rpm	Safety Injection Pump(s) Suction	32½ psi	200 psi
MV-32074 MV-32177	Limitorque, SMB-00 1700 rpm	Reactor Safety Injection Hot Leg Isolation	2510 psi	2750 psi
MV-32172 MV-32170 MV-32069 MV-32067	Limitorque, SMB-00 1700 rpm	Reactor Safety Injection Hot Leg Isolation	2510 psi	2750 psi
MV-32202 MV-32203 MV-32204 MV-32205	Limitorque, SMB-00 1750 rpm	Safety Injection Pump(s) Mini-Flow Recirculation Valves	2287½ psi	2750 psi

TABLE 1

VALVE IDENTIFICATION AND DIFFERENTIAL PRESSURES

VALVE(S)	VALVE ACTUATOR	FUNCTION	IEB 85-03 EVAL ΔP (MAX)	ORIGINAL DESIGN ΔP
MV-32333 MV-32335 MV-32336 MV-32345	Rotork 14A	Condensate to Auxiliary Feedwater Pump Suction	14 psi	25 psi
MV-32025 MV-32026 MV-32027 MV-32030	Limitorque SMB-000 1700 rpm	Cooling Water to Auxiliary Feedwat Pump Suction	135 psi	150 psi
MV-32016 MV-32017 MV-32019 MV-32020	Limitorque SMB-00 1700 rpm	Main Steam Supply to Turbine Driven Auxiliary Feedwater Pump	1086 psi	1100 psi
MV-32238 MV-32239 MV-32246 MV-32247	Limitorque, SMB-00	Turbine Driven Auxiliary Feedwater Pump Discharge to Steam Generators	1780 psi	1630 psi
MV-32381 MV-32382 MV-32383 MV-32384	Limitorque, SMB-000 1700 rpm	Motor Driven Auxiliary Feedwater Pump Discharge to Steam Generator	1780 psi	1630 psi

TABLE 2

IEB 85-03 MAXIMUM DIFFERENTIAL PRESSURE EVALUATION AND BASIS

VALVE(S)	Close to Open/Open to Close 85-03 EVAL ΔP	BASIS
MV-32081 MV-32082 MV-32184 MV-32185	23½/32½ psi	Elevation head of boric acid storage tank for closed to open. Elevation head of refueling water storage tank for open to closed.
MV-32079 MV-32080 MV-32182 MV-32183	32½ psi	Elevation head of refueling water storage tank for closed to open <u>or</u> open to closed.
MV-32162 MV-32163 MV-32190 MV-32191	32½ psi	Elevation head of refueling water storage tank for closed to open <u>or</u> open to closed. High pressure on downstream side of valve is not possible due to interlock with Safety Injection Pump suction from RHR.
MV-32074 MV-32177	2510 psi	Reactor coolant system safety valve set point plus 1 percent ASME tolerance for closed to open <u>or</u> open to closed (This ΔP is greater than the ΔP that would be developed if the safety injection pumps were taking suction from the RHR system).
MV-32172 MV-32170 MV-32069 MV-32067	2510/2465 psi	Reactor coolant system safety valve set point plus 1 percent ASME tolerance for closed to open. Safety injection pump shutoff head while taking suction from RHR at 210 psi for open to closed.

TABLE 2

IEB 85-03 MAXIMUM DIFFERENTIAL PRESSURE EVALUATION AND BASIS (CONT'D)

VALVE(S)	Close to Open/Open to Close 85-03 EVAL ΔP	BASIS
MV-32202 MV-32203 MV-32204 MV-32205	2287½ psi	Safety injection pump shutoff head plus maximum elevation head of refueling water storage tank for open to closed. An elevated ΔP without pressure assisting the motor actuator is not possible in the closed to open cycle. The downstream side of the valve is vented to atmosphere.
MV-32333 MV-32335 MV-32336 MV-32345	14 psi	Elevation head of condensate storage tank.
MV-32025 MV-32026 MV-32027 MV-32030	135 psi	Cooling Water Pump shut off head
MV-32016 MV-32017 MV-32019 MV-32020	1086 psi	Lowest Main Steam Safety Valve setpoint plus 1 percent ASME tolerance
MV-32238 MV-32239 MV-32246 MV-32247	1086/1780 psi	Lowest Main Steam Safety Valve setpoint plus 1 percent ASME tolerance for closed to open. Auxiliary feedwater pump shutoff head plus suction pressure developed by cooling water pumps (nominal cooling water pump discharge pressure) for open to closed.
MV-32381 MV-32382 MV-32383 MV-32384	1086/1780 psi	Lowest Main Steam Safety Valve setpoint plus 1 percent ASME tolerance for closed to open. Auxiliary feedwater pump shutoff head plus suction pressure developed by cooling water pumps (nominal cooling water pump discharge pressure) for open to closed.

TABLE 3

IEB 85-03 MOTOR ACTUATOR/VALVE COMPLIANCE PROGRAM

1. Motor valve opening and closing control modes, be it torque control or limit control, are to be reviewed. Incorporated in this initial review will be a review of any control interlocks associated with the designated valves to assure any switch settings to be changed do not affect valve position indication or signals to other equipment. (Review to be completed by October 1, 1986.)

2. Documented existing switch settings and methods for setting the switches will be reviewed and compared to existing manufacturer's recommendations. This review will encompass torque switches, torque bypass switching, limit switches and thermal overloads. (Review to be complete by October 1, 1986.)

3. Using any new or revised methods for setting switches developed from item 2, above, existing plant procedures will be updated to reflect the new methodology. (Procedure revisions to be completed by December 1, 1986.)

4. Prior to changing any existing switch settings plant personnel will be trained on full scale operational motor valves. Furthermore, the adequacy of the revised procedures will be demonstrated. (Training and procedure verification will be completed by April 1, 1987.)

5. The testing of the motor valves will consist of:

   a. As found current and/or power traces.

   b. Switch resetting, if necessary.

   c. Differential pressure test at elevated pressures taking current and/or power traces.

   d. Test result reviews and motor valve operability declaration.

   e. Updating existing setpoint files.

   Testing and resetting of any switches for motor operated valves will be performed during the spring, 1987 refueling outage for Unit 1. Due to manpower limitations, the testing and resetting of the Unit 2 switches cannot be completed until the Unit 2 refueling outage currently scheduled for January, 1988. Based on this schedule, the Unit 2 program will exceed the completion date specified in Item (e) of the bulletin by approximately three months.

6. The valves previously identified will be incorporated into the scheduled preventive maintenance program. Maintenance, consisting of current/power trace, motor megger, actuator inspection, valve stem lubrication will be performed on each actuator every 5 years. This maintenance will also verify switch settings. To further verify the switch settings are maintained, surveillance procedures will be developed. These procedures will inspect and verify correct settings.

7. A final report, providing 1) verification of the completion of the motor valve program, 2) a summary of as found valve operability and 3) a summary of the data collected will be submitted within 60 days after completion of item 5 above.