

Maine Yankee

RELIABLE ELECTRICITY FOR MAINE SINCE 1972

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January 2, 1990
MN-90-01 CDF-90-01

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, D. C. 20555

References: (a) License No. DPR-36 (Docket No. 50-509)
 (b) USNRC Bulletin No. 88-04: Potential Safety-Related Pump Loss
 (c) Maine Yankee Letter to USNRC dated July 7, 1988 (MN-88-71) -
 Response to NRC Bulletin No. 88-04

Subject: Follow-up Response to USNRC Bulletin No. 88-04, Potential Safety-Related Pump Loss

Gentlemen:

USNRC Bulletin No. 88-04, Reference (b), requested licensees to investigate and correct as applicable two miniflow design concerns. Maine Yankee responded to this issue with Reference (c). In our response, we indicated that the Maine Yankee plant design and operation and surveillance practices preclude problems with miniflow, as identified in the Bulletin. We also indicated that we would follow-up with the pump suppliers as final confirmation of our conclusion, and that we would report results to the USNRC.

Maine Yankee has contacted the suppliers of the pumps subject to Reference (b), and identified in Reference (c). We have reviewed and evaluated the pump supplier's current recommendations. As anticipated, the suppliers would like more flow for continuous operation, but most have indicated that our flow rates are acceptable considering anticipated pump use and previous service. One supplier, Sulzer Bingham, recommended that we increase the recirculation flow rate for our two Low Pressure Safety Injection/Residual Heat Removal (LPSI/RHR) pumps, P-12A and B, from 350 gpm to 1100 gpm. They believe that the 350 gpm flow rate may cause internal vibrations and hydraulic instabilities that could cause accelerated wear of the pump bushings.

The LPSI/RHR pumps have been operated intermittently, over the last 17 years, to provide shutdown cooling. They have also been operated at the 350 gpm recirculation flow for approximately 15 minutes each month, for required performance testing. The pumps had never been overhauled, and they had exhibited no significant signs of degradation. Based on Sulzer Bingham's recommendation, and a review of our

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Inservice Testing Data, we decided to disassemble and inspect one of the LPSI/RHR pumps, P-12A. Inspection revealed that the pump was in good condition with the exception of excessive wear on the upper shaft bearings; this wear is not attributable to hydraulic instabilities or low flow operation. Sulzer Bingham believes the wear was caused by a poor fit of the line shaft coupling (which is between the two bearings). The coupling and bearings will be replaced during pump reassembly.

Maine Yankee believes that the LPSI/RHR pumps, P-12A and B, have adequate miniflow systems. We base this belief on the pumps' good performance for 17 years and the results of the inspection of P-12A. We believe that the pumps' supplier, Sulzer Bingham, was conservative with their new minimum recirculation recommendations.

Finally, we have identified an item that should be included in Attachment C, "Estimated Times at Minimum Flow", of our previous response to Bulletin 88-04, Reference (c). The following has been added under HPSI pumps and CS pumps, Refueling Surveillance Tests:

- Emergency Diesel Generator/Emergency Core Cooling System Cold Shutdown Test Reference Procedures 3.1.14A and B
The tests place a pump at MR for short duration

This evolution adds a little to the accumulated time on MR (minimum recirculation), however, it does not affect our conclusions regarding the adequacy of the pumps' minimum recirculation systems. A revised Attachment C of Reference (c) is enclosed.

Maine Yankee believes that with the foregoing we have satisfied the requirements of USNRC Bulletin No. 88-04.

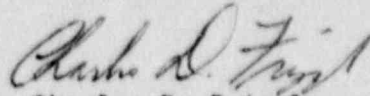
The foregoing notwithstanding, we believe that continued use of inspection and preventative maintenance measures will assure the continued reliability of these pumps. Accordingly, we plan to:

- Disassemble and inspect LPSI/RHR pump P-12B by the end of 1991.
- Establish a preventive maintenance item to periodically (e.g., every ten years) disassemble and inspect LPSI/RHR pumps P-12A and P-12B.

As a result of our review of this issue, we have initiated a review of our emergency operating procedures to determine appropriateness of additional notes/cautions on operation of the pumps subject to this Bulletin. We intend to incorporate any resultant changes in conjunction with procedure revisions scheduled for completion by August 31, 1991.

Should you have any questions on the foregoing, please contact us.

Very truly yours,



Charles D. Frizzle
President

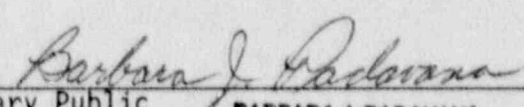
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Enclosure: Revised Attachment C of Maine Yankee Letter 07/07/88 (MN-88-71)

c: Mr. William T. Russell
Mr. Eric J. Leeds
Mr. Cornelius Holden

STATE OF MAINE

Then personally appeared before me, Charles D. Frizzle, who being duly sworn did state that he is President of Maine Yankee Atomic Power Company, that he is duly authorized to execute and file the foregoing response in the name and on behalf of Maine Yankee Atomic Power Company, and that the statements therein are true to the best of his knowledge and belief.


Notary Public

BARBARA J. PADAVANA
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES JUNE 20, 1996

ENCLOSURE

REVISED ATTACHMENT C
of Maine Yankee Letter 07/07/88 (MN-88-71)

Estimated Times at Minimum Flow

HPSI Pumps

- Normal Operation
Reference Procedure 1-11-6
Minimum Recirculation (MR) time is insignificant

- Monthly Surveillance Tests
Reference Procedure 3.1.2, 3.17.6.6
Tests are performed with the pumps in their normal charging mode and they are not run at MR.

- Loop Fill and Vent
Reference Procedure 1-10-1
This operation may require up to 6 hours with 50 gpm MR plus 12-14 gpm of seal water. This is a rough estimate because there are several evolutions that place the pump at MR, MR with seal water, and MR with seal water and 75-100 gpm make up.

- Refueling Surveillance Tests
 - Emergency Core Cooling System Testing]
Reference Procedure 3.1.15.2 and 3.1.15.3
The tests do not place the pumps at MR.

 - Emergency Diesel Generator/Emergency Core Cooling System Cold Shutdown Test]
Reference Procedures 3.1.14A and B]
The tests place a pump at MR for short duration (Note)]

- Emergency Core Cooling
Reference Procedure E-0, E-1, ES-1.1
One pump is normally charging and second pump starts on a SIAS. The discharge valves shift within 13 seconds to establish HPSI and terminate charging.

- * The worst case is a loop fill and vent which may place a pump at MR intermittently for several hours.

NOTE: Item added by Maine Yankee letter 01/02/90 (MN-90-01)]

LPSI (RHR Pumps)

- Normal Operation (Residual Heat Removal)
Reference Procedures 1-13-1 and 1-13-2
The pumps are not operated at minimum recirculation during RHR startup, operation or termination.
- Monthly Surveillances
Reference Procedures 3.1.2 and 3.17.6.6
The pumps are tested in the minimum recirculation mode for 15 to 30 minutes each.
- Refueling Surveillance Tests
Reference Procedures 3.1.15.2, 3.1.15.3
The tests do not place the pumps at MR.
- Emergency Core Cooling
Reference Procedure E-0, E-1, ES-1.1, ES-1.2, E-3
Both pumps start on a safety injection actuation signal (SIAS). They operate on minimum recirculation until the RCS pressure drops to 190 psig, or until they are secured by an operator.
- * The worst case estimate is 2 hours at MR during a small break LOCA.

CS Pumps

- The containment spray pumps are only used during surveillance tests and emergency core cooling.
- Monthly Surveillance Tests
Reference Procedure 3.1.2 and 3.17.6.6
The pumps are tested in the MR mode for 15 to 30 minutes each.
- Refueling Surveillance Tests
- Emergency Core Cooling System Testing]
Reference Procedure 3.1.15.3
Some of the recirculation flow tests place the pumps at MR for brief periods.
- Emergency Diesel Generator/Emergency Core Cooling System Cold Shutdown Test]
Reference Procedures 3.1.14A and B]
The tests place a pump at MR for short duration (Note)]

NOTE: Item added by Maine Yankee letter 01/02/90 (MN-90-01)]

- Emergency Core Cooling
Reference Procedure E-1, E-3, ES-1.1, ES-1.2
The pumps start on a SIAS and run on recirculation until the containment pressure exceeds 20 psig or an operator secures the pumps. The maximum time on MR is estimated to be 2 hours.
- * The worst case estimate is 2 hours at MR during a small break LOCA.

EFW Pumps

- Normal Operation (Heatup, Cooldown, Standby)
Reference Procedure 1-1, 1-7
The procedures do not preclude operation at MR. One pump could be on MR for up to 30 minutes.
- Monthly Surveillances
Reference Procedure 3.1.5 and 3.17.6.6
The pumps are operated at MR for 15 to 30 minutes each.
- Post Trip Cooling
Reference Procedure E-0 and E-0.1
Pumps start on a low steam generator level (35%) and provide full flow. If the Feedwater (FW) pumps are not operating, the EFW pumps are throttled back to approximately 200 gpm per generator but not less than 490 gpm total flow to all three generators.

If a FW pump was in operation, the EFW pumps would provide 20 gpm per generator plus 20 gpm MR for less than 1 hour.
- Placing Steam Generators in Wet lay-up.
Reference Procedure 1-104-14.
The EFW pumps are not run on recirculation.
- Refueling Surveillance Tests
Reference Procedure 3.1.22
The pumps may be at MR for less than 30 minutes.
- * The worst case estimate is 30 minutes of operation during surveillance tests.