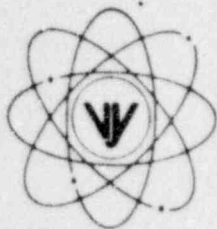


VERMONT YANKEE NUCLEAR POWER CORPORATION



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REPLY TO
ENGINEERING OFFICE
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December 18, 1995
BVY 95-138

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

- References:
- (a) License No. DPR-28 (Docket No. 50-271)
 - (b) NRC Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode."
 - (c) Letter, VYNPC to USNRC, BVY 95-123, "30-Day Response to NRC Bulletin 95-02," dated November 16, 1995

Subject: Response to Bulletin 95-02 Requested Action 2

In Reference (b), NRC alerted licensees to Residual Heat Removal (RHR) strainer clogging experienced during a recent event at another US BWR facility and requested specific licensee actions to address strainer clogging. In reference (c) Vermont Yankee committed to testing the RHR pump suction strainers during quarterly HPCI surveillance testing scheduled for December, 1995. Vermont Yankee successfully completed the testing on December 8, 1995. This letter transmits the response required by Reference (b) documenting completion of this testing and providing a summary of the test results.

Based on the information provided in Enclosure 1, Vermont Yankee believes that the confirmation testing of Requested Action 2 in Reference (b) has been satisfactorily completed and has confirmed the operability of safety systems which take suction from the torus. In addition, based on these results, the commitment from Reference (c) to perform RHR pump suction strainer testing has been completed and is considered closed. Visual inspection of the strainers and torus water sampling is scheduled for the 1996 refueling outage.

We trust this information is responsive to your concerns; however, should you have additional questions, please do not hesitate to contact us.

Sincerely,

Vermont Yankee Nuclear Power Corporation

Jay K. Thayer
Vice President, Engineering

Enclosure

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS

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ENCLOSURE 1

Overview of the Vermont Yankee RHR Pump Suction Strainer Test

Test Preparation

In preparation for the suction strainer testing, Special Test Procedure (STP) 95-12 was prepared and subsequently reviewed and approved by Vermont Yankee Plant Operations Review Committee (PORC) on December 1, 1995. A 10CFR50.59 evaluation, written to ensure the testing involved no unresolved safety questions, was also reviewed and approved by PORC.

The STP involved operation of the RHR system in the Torus Cooling mode with several different configurations of RHR pumps. Precision temporary instrumentation was installed to monitor RHR pump suction pressures. The intent of the test was to confirm the operability evaluation documented in Reference (c), which stated that based on the thorough cleaning of the torus bay completed earlier this year, the results of regular strainer inspections, actual system performance, and controls in place for Foreign Material Exclusion requirements during and subsequent to the outage, Vermont Yankee concluded that operability of the safety systems which take suction from the torus to perform their safety function is assured.

Prior to commencing the test, Vermont Yankee discussed the STP with NRC, Region 1. Vermont Yankee assured NRC that concerns for potential "common mode failure" of the RHR systems due to water hammer events caused by a loss of normal power during testing, has been adequately addressed in the STP. Additionally, Vermont Yankee noted that time spent during testing in modes different from normal operational modes was minimized.

Reference (c) identified the potential for acquiring torus water samples during this testing. However, during the preparation of the STP for this portion of the test, it was identified that opening the normally closed primary containment isolation valves required for this sampling would require credit for operator action in closing these valves if an accident (i.e. LOCA) occurred during this evolution. Based on discussions with other plants that have considered or completed this sampling, and discussions with PORC, it was determined that the risk associated with this sampling was greater than the benefit of the information that may have been acquired from sampling. Additionally, monitoring RHR pump suction pressure during operation in the torus cooling mode is a better method of identifying strainer clogging. Therefore, torus water sampling was not performed as part of the STP and has been scheduled for the 1996 refueling outage.

Test Description and Results

The Vermont Yankee RHR System is made up of two independent loops, with RHR pumps "A" and "C" in loop "A", and RHR pumps "B" and "D" in loop "B". Testing was performed in 4 segments or sub-tests: first, RHR pump "C" operating alone for 1.5 hours, then RHR pumps "C" and "B" operating simultaneously for 1 hour, then RHR pump "B" operating alone for 1 hour, and finally RHR pumps "B" and "D" operating simultaneously for 1 hour. Total test time was approximately 4.5 hours. Established acceptance criteria were verified prior to initiating each step in the STP.

The results of the test demonstrated appropriate RHR pump performance in all configurations with no indications of strainer clogging. The suction pressure of RHR pump "C" ranged between 2.5 and 2.7 psig during its 2.5 hours of operation. The suction pressure of RHR pump "B" ranged between 2.3 and 2.4 psig during its 2 hours of operation as the only operating pump in loop "B" and remained

constant at 2.15 psig when operated with the RHR pump "D". The suction pressure of RHR pump "D" remained constant at 2.0 psig during its 1 hour of operation. The table below provides a brief summary of this test data:

Pumps Running	Time Operated	Total Test Time	Observed Pump Suction Pressure
C	1.5 hours	1.5 hours	C: 2.5-2.7 psig
C & B	1.0 hour	2.5 hours	C: 2.5-2.7 psig B: 2.3-2.4 psig
B	1.0 hour	3.5 hours	B: 2.3-2.4 psig
B & D	1.0 hour	4.5 hours	B: 2.15 psig D: 2.0 psig

The results from the testing, which included 2.5 hours of RHR loop "A" operation and 3.0 hours of RHR loop "B" operation, confirmed the operability of the systems. Of particular significance is the absence of degraded pump suction pressures over time, a typical indicator of ECCS pump suction strainer clogging.

Additionally, expected static and dynamic pump suction pressure ranges were verified during testing. Test results verified that calculated friction losses used in current RHR pump NPSH calculations are conservative.