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United States Nuclear Regulatory Commission
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References: a. License No. DPR-28 (Docket No. 50-271)
b. USNRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping", NVY 90-119, dated 6/15/90

Subject: Temporary Non-Code Repair of Service Water Piping in the Intake Structure

In accordance with Generic Letter 90-05 and 10CFR50.55a(g)(6)(i) this letter is being submitted to document actions taken by Vermont Yankee to evaluate, without immediate code repair, a small leak in the Service Water piping at the Vermont Yankee Nuclear Power Station, and to request relief from the requirement to perform an immediate code repair.

The Operations Department reported leakage from a three-inch Service Water (SW) branch line (3" SW-28) off the main Service Water header in the intake structure on August 31, 1994. The Service Water System is supplied water from the Connecticut River. The leak is located at a weld in a portion of the branch line to the chlorination system and circulating water pump cooling supply. The leak is located at the 9 o'clock position on the upstream side weld of valve V70-130A and results in approximately 1 drip every 5 minutes. See Figure 1 attached and FSAR Figure 10.6-1a for the flow diagram and arrangement of these components.

Ultrasonic examination of the weld was performed. The UT results showed several localized areas indicative of either inclusions, pitting or microbiological induced corrosion (MIC) originating from the inner diameter of the pipe. Previous leakage in a similar pipe was determined to be caused by MIC. The indications were scattered around the circumference, with the minimum wall thickness in excess of 0.100 inches, except for one localized reading of 0.08 inches. The majority of the weld was measured at greater than 0.2". The code required minimum wall thickness for this piping is 0.0795". Six additional weld locations along this 3" pipe were chosen for augmented inspection based on similarity in environment and identical size. Indications were identified at two of the six locations but no areas were less than code acceptable minimum wall thickness.

Engineering analysis was previously performed to evaluate a similar condition in 1993 using design basis values for deadweight, pressure, thermal and seismic loading. A review of the existing analysis has found that the present condition is bounded by the analysis and the same conclusions can be drawn; i.e., structural margin has been determined to be adequate to ensure the integrity of the piping system. The analysis has been documented via a formal calculation (VYC-1203) in accordance with our approved QA program.

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Repair of the 3" SW-28 line upstream of isolation valve V70-130A would require the isolation of the "B" service water strainer and the 24-inch main supply header of the "B" Service Water Subsystem. Service Water loads could be supplied through the "A" Service Water strainer through use of system cross connect valves. However, repair of the leak is not deemed to be prudent while at power. Although the strainers are each rated for 100% flow, a malfunction such as plugging of the "A" strainer could increase the risk of a loss of Service Water flow. The consequences of such an event would be significantly reduced with repairs being made during shutdown conditions. Therefore, it is deemed impractical to isolate this portion of the system and perform a code repair while the plant is operating.

A plant walkdown was conducted to assess the potential for adverse flooding or water spray impacts should the leaking pipe rupture. Line 3" SW-28 is located in the Service Water/Fire Protection (SW/FP) Pump Room of the Intake Structure. The SW/FP Pump Room contains the four service water pumps, the diesel and electric fire pumps and the piping, valves and strainers associated with these systems.

In the unlikely event that line 3" SW-28 ruptures, the SW/FP Pump Room contains a number of drain paths to accommodate flooding, including three 4-inch floor drains, two large (10-inch and 12-inch pipe size equivalent) pipe penetrations, and a non-water tight doorway, all of which could direct significant amounts of water back to the river in the event of a pipe rupture. Further, as described in Vermont Yankee Flooding Study, the complete loss of the Service Water System has been previously analyzed by considering the loss of the Vernon Dam (resulting in loss of river water supply to the Intake Structure). As described in Section 10.8 of the Vermont Yankee FSAR, the Alternate Cooling Water System is designed for such an event. Additionally, the complete loss of the Intake Structure is assumed during a maximum probable flood.

With regard to water spray, there are a number of components in the SW/FP Pump Room such as pump motors and valves which could be contacted by water spray. However, water spray concerns are enveloped by the fact that the plant is designed for a complete loss of operability of equipment in the intake structure due to flooding, as described above. This would bound the loss of any selected system or subsystem within the structure.

The leaking weld had previously been UT inspected as part of the augmented inspections resulting from the similar leak in 1993 on the "A" SW subsystem. The UT inspection was performed with cursory preparation of the weld, i.e. the weld was wire brushed to remove scale but a full flat-topping of the weld had not been performed. When the initial characterization UT's were performed on the weld after the present leak was observed, it was not possible to identify the flaw by UT examination with the existing weld condition. The weld was then flat-topped and a thorough scan of all portions of the weld was possible ensuring that all flaws were observable. Due to the extremely small flaw, it would have been necessary to flat-top the weld in 1993 to identify the existing flaw which became the leak. The intent of the augmented inspections in 1993 was to ensure that there were no portions of the service water system in susceptible locations which were structurally inadequate and from that standpoint the UT's were acceptable. However, based on the experience gained from these inspections, future characterization UT's and augmented inspection UT's on Safety Class 3 piping (to support Generic Letter 90-05 guidance) will have welds extensively prepped to ensure that a thorough UT examination is feasible.

In summary, the leak is in a moderate energy Safety Class 3 piping system (design temperature 150°F and design pressure of 125 psig). The piping is three-inch, schedule 40, ASTM A-106, Gr.B with a nominal thickness of 0.216". The valve (V70-130A) is 150lb. class cast carbon steel. Present leakage is being removed from the area by means of the floor drain system. Implementation of a code repair would require either a plant shutdown or a plant system line-up that would challenge reliable Service Water System operation. Engineering evaluations have demonstrated that the structural integrity of the piping system remains unaffected. To ensure that the structural margin of the pipe is not reduced below an acceptable level (as determined by evaluation by the "Through-Wall Flaw" approach), Vermont Yankee shall continue to monitor the leakage daily, quantitatively assess the leakage once per week, and shall perform UT inspections once every two months. No leak-mitigating measure is intended to be implemented.

Vermont Yankee concludes that relief from immediate code repair will present no undue risk to the health and safety of the public. We request that the USNRC grant relief to allow deferral of a code repair until the next available opportunity but no later that startup from the 1995 refueling outage.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Leonard A. Tremblay, Jr.

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cc: USNRC Region I Administrator
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FIGURE 1

Excerpt from FSAR Fig. 10.6-1a