

# VERMONT YANKEE NUCLEAR POWER CORPORATION

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June 4, 2001  
BVY 01-44

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

**Reference:** (a) Letter, USNRC to VYNPC, "Safety Evaluation of the Request for Relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Vermont Yankee Nuclear Power Station (TAC No. MA9116)," NVEY 00-124," dated December 5, 2000.

**Subject:** Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)  
Request For Relief from the American Society of Mechanical Engineers  
Code for Repair of a Reactor Building Recirculation Unit

Pursuant to 10CFR50.55a(g)(5)(iii), Vermont Yankee (VY) hereby requests approval to delay the repair of minor leaks on Reactor Building Recirculation Unit No. 8 (RRU-8) until the 2002 refuel outage. RRU-8 is a Safety Class 3 component that provides room cooling for Emergency Core Cooling System equipment located in the Reactor Building.

The identified leaks have been evaluated and VY has concluded that the RRU remains capable of performing its safety functions. At present, the RRU is experiencing minor leakage and VY is monitoring the leakage during each shift. A mechanical device was not considered necessary to prevent further leakage and will not be installed at this time.

Attachment 1 provides the information supporting this request. We trust that this information is adequate to support the requested action, however; should you need additional information please contact Mr. Jim DeVincentis at (802) 258-4236.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

  
Gautam Sen  
Licensing Manager

**Attachment**

cc: USNRC Region 1 Administrator  
USNRC Resident Inspector - VYNPS  
USNRC Project Manager - VYNPS  
Vermont Department of Public Service

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Docket No. 50-271  
BVY 01-44

Attachment 1

Vermont Yankee Nuclear Power Station

Information Supporting Requested ASME Code Relief for RRU-8

## **BACKGROUND**

During the past operating cycle, Vermont Yankee (VY) requested and was granted code relief due to a small leak on Reactor Building Recirculation Unit No. 8 (RRU-8). The relief was granted in Reference (a). The subject joint on RRU-8 was successfully repaired during the 2001 Refuel Outage.

When the system was returned to service following the repair of RRU-8, two different joints were observed to have minor leakage. The two additional leaks are located at brazed connections where two of the 5/8 inch OD stub tubes connect to the inlet manifold. The new leaks are very small such that the amount of water is currently insufficient to form a droplet.

An assessment of impact on operability was completed consistent with Generic Letter 91-18. VY concluded that the identified leakage did not impact the operability of RRU-8 or have the potential to impact other safety-related equipment in the area.

## **REQUIREMENT FOR WHICH RELIEF IS REQUESTED**

The American Society of Mechanical Engineers Code, Section XI, IWA-4000 requires that a code repair be performed to restore the system's structural integrity back to original design requirements.

## **BASIS FOR RELIEF**

VY has evaluated the risks associated with attempting a repair on the subject connections and determined that it is impractical to perform a repair due to concerns that repair efforts could further degrade the component. VY has determined that the appropriate corrective action for the identified conditions is to perform a coil replacement. VY did not consider the prior refueling outage an opportunity to resolve this condition and a replacement with the plant operating can not be completed within the applicable LCO timeframe.

## **TECHNICAL ASSESSMENT OF CONDITION**

VY has performed a cause assessment based on the examinations completed to date and experience with similar conditions identified on similar components in the past. VY has determined that the most probable cause of the condition is partial fusion of a portion of the brazed joint that occurred during the manufacturing process. VY believes that the condition propagated to the surface during the approximately six years that the existing coil has been in service and was uncovered due to the recent repair activity.

An engineering evaluation was completed to determine the impact of the identified condition on RRU-8. This assessment investigated the impact on the cooling capacity, structural integrity, and the potential for the condition to impact safety-related equipment in the area due to spraying on the equipment or flooding in the area.

RRU-8 is a safety class 3 component that is supplied with cooling water from the Service Water system. RRU-8 auto-starts whenever a Core Spray (CS) or Residual Heat Removal (RHR) pump in the associated Emergency Core Cooling system room is operating. This ensures the CS, RHR and RHR Service Water system components are maintained within their environmental temperature limits. The two additional minor leaks are located at brazed connections where two of the 5/8 inch OD stub tubes connect to the inlet manifold. The new leaks are very small such that the amount of water is insufficient to form a droplet. Because the observed leakage rate was very small ( $< 0.005$  gpm) compared to the design flow rate of RRU-8 (146 gpm), the leak will not compromise the cooling capacity of RRU-8.

The two 5/8 inch OD stub tubes connect to the inlet manifold using a brazed joint configuration. The leaks are due to localized defects in the brazed material. A comparative analysis of the load carrying capacity of one of the 5/8 inch OD tubes with and without a 1/16 inch flaw was performed. A 1/16 inch flaw would result in an increased stress level of approximately 10 percent. This increase in stress level is well within the factors of safety inherent in design codes. Additionally, the stress analysis for the attached piping system demonstrates that the major loads are from deadweight and thermal stress and therefore, transient events would not be expected to cause additional leaks to develop. Based on this evaluation, the conditions noted will not challenge the structural integrity of the component.

The leakage from the stub tube connections was evaluated to determine if it presented a concern due to flooding, spraying of water on equipment, and loss of cooling flow to vital components. Total inventory loss due to the through-wall failures on RRU-8 is estimated to be less than 0.005 gpm, which is insignificant in terms of any single Service Water pump's capacity ( $\sim 3000$  gpm) and the required seven day inventory provided to support Alternate Cooling system operation.

In the event that power to the corner room sump is not available post-LOCA, any leakage would begin accumulating in the lower elevation. Assuming access to the Reactor Building was prevented for 30 days following an event, water would accumulate to a depth that is well below the maximum allowable flood level of 1 foot per the emergency operating procedures. Therefore, issues relative to flooding of vital safety components is not of concern.

There are no instrumentation or electrical components in the immediate vicinity of the leak and the observed leak was extremely small with no fluid jet streaming. Therefore, issues relative to spray impingement on safety related equipment are not of concern.

The connection is currently experiencing very minor leakage and VY does not plan to install a mechanical device to prevent further leakage at this time. VY will replace the coil on RRU-8 before start-up from the 2002 refueling outage that is currently scheduled to start in the fall of 2002.

VY performed visual inspections on the accessible portions of 10 similar joint configurations on RRU-8 and did not identify any similar conditions.

The above evaluation has demonstrated that the identified condition does not have the potential to adversely impact safe operation or public health and safety until such time that a coil replacement can be completed.

#### **PROPOSED ALTERNATIVE REQUIREMENTS**

Performance of Ultrasonic or Radiographic Technique examinations was determined to not be practicable for the identified configuration. VY has initiated a once per shift inspection of the RRU to ensure no further indications of deteriorating conditions that might impact operability of safety related equipment.

## SUMMARY OF VERMONT YANKEE COMMITMENTS

BVY NO.: 01-44

The following table identifies commitments made in this document by Vermont Yankee. Any other actions discussed in the submittal represent intended or planned actions by Vermont Yankee. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager of any questions regarding this document or any associated commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"
Replace the coil on RRU-8 prior to start-up from the 2002 refuel outage.	2002 Refuel Outage