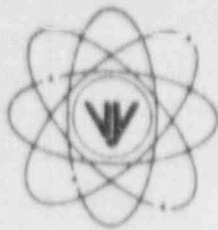


VERMONT YANKEE NUCLEAR POWER CORPORATION



Ferry Road, Brattleboro, VT 05301-7002

REPLY TO
ENGINEERING OFFICE

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September 30, 1997
BVY 97-123

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

- References:
- (a) License No. DPR-28 (Docket No. 50-271)
 - (b) Letter, USNRC to VYNPC, NVCY 96-153, dated October 2, 1996
 - (c) Letter, USNRC to VYNPC, NVCY 96-176, dated November 20, 1996
 - (d) Letter, Carl Terry (Niagara Mohawk) to Brian Sheron (USNRC), dated May 30, 1997, "BWR Utility Commitments to the BWRVIP"

Subject: Vermont Yankee's Plans For the 1998 and 1999 Refueling Outages Regarding Reactor Vessel Internals

In Reference (b) the NRC requested that Vermont Yankee submit its plans for the next inspection of the Core Shroud at Vermont Yankee Nuclear Power Station at least six months prior to the inspection. Additionally, in Reference (c) the NRC requested that Vermont Yankee submit its plans for reinspection of the Core Spray system piping internal to the reactor pressure vessel at least three months prior to the next refueling outage. The attachment to this letter describes the inspection and repair activities planned for Vermont Yankee's Spring 1998 and Fall 1999 refueling outages as well as additional information regarding implementation of BWRVIP at Vermont Yankee.

We trust that this submittal provides the requested information. However, should you have questions or require additional information, please contact this office.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Donald A. Reid
Senior Vice President, Operations

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- c: USNRC Region I Administrator
USNRC Project Manager - VYNPS
USNRC Resident Inspector - VYNPS

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VERMONT YANKEE'S PLANS FOR THE 1998 AND 1999 REFUELING OUTAGES REGARDING REACTOR VESSEL INTERNALS

Introduction

Vermont Yankee is dedicated to the BWRVIP and to the five specific commitments identified in Reference (d). Specifically, Vermont Yankee will:

- continue to provide the financial and technical resources needed to complete the BWRVIP Program Plan;
- actively participate in completing the BWRVIP Program Plan;
- implement the BWRVIP products at Vermont Yankee Nuclear Power Station as appropriate considering plant schedule, configuration and needs;
- provide timely notification to the NRC staff if Vermont Yankee does not implement the applicable BWRVIP product and
- continue to work closely with the NRC staff for the successful and timely conclusion of the BWRVIP Program Plan;

Pursuant to these commitments Vermont Yankee's plans for our Spring 1998 and Fall 1999 refueling outage as they relate to the BWRVIP are provided below. This letter addresses all of the current BWRVIP requirements regarding inspection scope and scheduling as they apply to the reactor vessel internals components at Vermont Yankee. In addition to the work described below, Vermont Yankee will also be performing the normal complement of in-vessel visual inspections per ASME Section XI, General Electric Service Information Letters (SIL's), etc. during the 1998 and 1999 refueling outages.

Core Shroud

Vermont Yankee completed an ultrasonic inspection of its circumferential welds in the Spring of 1995, and as a result of that inspection performed a full circumferential weld repair in the Fall of 1996. That repair consisted of four tie rods. In conjunction with the repair, Vermont Yankee performed ultrasonic and eddy current inspections of the repair design reliant welds during the Fall 1996 outage. The design reliant welds consist of portions of eight vertical welds, six ring segment welds and portions of welds H8 and H9 at the jet pump baffle plate. No cracking was found in any of these welds.

Due to Vermont Yankee's aggressive inspection program, the 1996 vertical and ring segment weld inspections will meet the BWRVIP Guidelines for Reinspection of BWR Core Shrouds (BWRVIP-07) requirements for a complete baseline inspection of repaired shrouds, even as they are now being revised (as a result of Nine Mile Point 1 vertical weld cracking). Because Vermont Yankee has performed a full baseline inspection of the repair design reliant welds, the BWRVIP reinspection frequency does not require Vermont Yankee to perform an inspection in either the 1998 or 1999 outages.

In the Spring of 1998, Vermont Yankee will perform the first cycle inspection of all four tie rods. The inspection will consist of a visual examination to criteria approved by the repair designer.

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There will be specific criteria for component condition and part engagement, orientation, configuration and interface.

Shroud Support

In the Fall of 1996, Vermont Yankee performed ultrasonic and eddy current inspection of welds H8 and H9. No cracking was found. The BWRVIP Shroud Support Inspection and Flaw Evaluation Guidelines are in the course of preparation and have not yet been published; however, the Vermont Yankee Fall 1996 inspection meets the requirements of the current BWRVIP draft guidelines for a baseline examination. The BWRVIP draft guideline reinspection frequency does not require Vermont Yankee to perform a reinspection in either the 1998 or 1999 outages.

Core Spray Piping

In the Fall of 1996, Vermont Yankee performed ultrasonic inspection of 39 core spray piping circumferential welds and visual inspection of five circumferential welds that were not accessible for the ultrasonic inspection. These 44 welds represent 100% of the accessible core spray piping welds. These inspections met the requirements of the BWRVIP Core Spray Internals Inspection and Flaw Evaluation Guidelines (BWRVIP-18) for a baseline examination. Two non-pressure boundary mechanical welds, where the core spray piping penetrates the core shroud, were found to have indications of possible intergranular stress corrosion cracking. The flaw analysis evaluated several possible conditions of the core spray piping, including the limiting case where all four mechanical collar welds were completely failed. The NRC evaluated the analysis and authorized operation through the end of Cycle 19 without performing weld repairs [Reference (c)]. However, the NRC stipulated that operation of Vermont Yankee beyond Cycle 19 would depend on the satisfactory evaluation of the reinspection results or by implementing acceptable repairs during the next refueling outage.

The BWRVIP core spray piping reinspection frequency for ultrasonic inspection is two cycles. The 39 welds that were inspected ultrasonically in 1996 would require reinspection in 1999. The BWRVIP core spray piping reinspection frequency for visual inspection is one cycle. Therefore, the five welds that were inspected visually in the Fall of 1996 will be reinspected in the Spring of 1998. In 1998 Vermont Yankee will also visually reinspect the two core spray piping welds that exhibited possible cracking.

As a result of the flaws found in 1996 and because of the core spray piping's susceptible material, Vermont Yankee is planning full replacement of the core spray piping system internal to the reactor vessel (excluding the spargers), during our 1999 refueling outage. To that end, Vermont Yankee will proceed to obtain vessel internals as-built dimensions during the 1998 refueling outage, as they relate to a core spray piping replacement. Also in that regard, Vermont Yankee is not anticipating a localized repair of one or both cracked core spray pipe collar welds in 1998, unless the reinspection warrants such a repair.

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Core Spray Spargers

Through the Fall 1996 refueling outage, Vermont Yankee has been following the requirements of IE Bulletin 80-13 for the inspection of core spray spargers. Beginning with the Spring 1998 outage Vermont Yankee intends to follow the guidance of the BWRVIP Core Spray Internals Inspection and Flaw Evaluation Guidelines (BWRVIP-18). Per the BWRVIP definition, Vermont Yankee is a geometry tolerant plant with regard to its spargers. Accordingly, Vermont Yankee will perform modified VT-1 inspections of the core spray sparger circumferential welds and VT-3 of the nozzles and brackets in 1998. The reinspection frequency for spargers for geometry tolerant plants is two cycles, as defined by BWRVIP-18.

Top Guide

The BWRVIP Top Guide Inspection and Flaw Evaluation Guidelines (BWRVIP-26) were published in December of 1996. For Vermont Yankee these guidelines would require a VT-1 inspection of welds in two adjacent aligner assemblies every other cycle and a visual inspection every other cycle of rim weld locations made accessible during normal refueling activities. The need to inspect the top guide hold-down assemblies is being evaluated by Vermont Yankee.

The welds in question are virtually inaccessible for visual inspection. Vermont Yankee did a "best effort" visual examination of two of the aligner assemblies in 1996. This best effort was similar to a VT-3 examination. Ultrasonic inspection of these welds has been investigated and accessibility to some of the welds is improved, however, the majority would still not be accessible, even from alternative surfaces. Additionally, there are no vendor tools that currently exist or are in development to provide better access for either ultrasonic or visual inspection. Development of inspection tooling has been determined to be cost prohibitive when compared to installing redundant alignment hardware.

The BWRVIP Inspection Committee has not yet provided guidance on the examination of the above top guide components. At this time, Vermont Yankee believes that a BWRVIP acceptable visual inspection of these locations at Vermont Yankee would be impractical to perform due to the limited accessibility, and has elected instead to install top guide wedges to preclude the need for any inspection. For plants with top guide wedges, the only inspection required by BWRVIP-26 is to verify that the wedges are in place.

Vermont Yankee intends to install top guide wedges during the Fall 1999 refueling outage. The Spring 1998 refueling outage will be used to acquire the necessary dimensional information.

Because Vermont Yankee intends to install top guide wedges in 1999, Vermont Yankee does not plan to perform any supplemental inspections of the top guide alignment hardware in 1998, except as in preparation for the 1999 refueling outage. Vermont Yankee completed GE SIL No. 588 inspection recommendations in the Fall 1996 refueling outage and will continue to perform examinations as recommended by GE SIL 554 and do visual inspections of top guide beams as they become accessible during the normal course of refueling operations.

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Core Plate

The BWRVIP Core Plate Inspection and Flaw Evaluation Guidelines (BWRVIP-25) were also published in December of 1996. For Vermont Yankee these guidelines require an ultrasonic or visual examination of a critical number of rim hold-down bolts. The BWR Inspection Committee and EPRI are developing a technique to perform ultrasonic examination of these bolts, but it is not clear that the technique will be ready for the 1998 outage, or that it will be successful. Currently, there are no vendors capable of delivering such an ultrasonic inspection device. In 1996, Vermont Yankee conducted a visual inspection of the top of the rim hold-down bolts. No problems or anomalies were observed. BWRVIP-25 requires access to both the top and the bottom of the bolts if visual examination is chosen. To inspect the bottom of the bolts, the cameras must be delivered under the core plate. This would be an extreme hardship for any BWR, requiring removal of in-core components and CRD's to provide access.

Because installation of wedges would preclude the need for inspection of the core plate rim hold-down bolts, Vermont Yankee's strategy for the core plate is similar to that of the top guide. Vermont Yankee intends to install core plate wedges during the Fall 1999 refueling outage. Vermont Yankee will use the 1998 outage to prepare for the installation in 1999.

Again, because Vermont Yankee intends to install core plate wedges in 1999, we do not plan to perform any inspection on the core plate in 1998, except as in preparation for the 1999 refueling outage. GE SIL No. 588 inspection recommendations were completed during the Fall 1996 refueling outage.

Jet Pump Assemblies

The BWRVIP Jet Pump Assembly Inspection and Evaluation Guidelines are not yet published, but because several plants have detected cracking in jet pump riser circumferential welds, inspection of these components has taken on a greater emphasis. Vermont Yankee has followed the development of the BWRVIP jet pump assembly guidelines and is planning to perform inspections in the 1998 or 1999 refueling outage. The inspections will meet those guidelines to the best of Vermont Yankee's ability considering the lateness of the issuance of the guidelines relative to the start of the 1998 outage.

The current BWRVIP draft guidelines require a 50% sample of the high priority welds at the next refueling outage. The high priority welds are essentially all of the circumferential welds in the riser, mixer, diffuser and adaptor pieces. At Vermont Yankee there are approximately 190 of these welds. Because of the time available between the projected issuance of the BWRVIP jet pump assembly guidelines this Fall and the start of the Spring 1998 refueling outage, Vermont Yankee may not be in a position to examine 50% of these welds to a standard that meets BWRVIP requirements. Vermont Yankee is currently out to bid for this work. Based on the nature of the proposals we will decide whether to examine these welds ultrasonically or visually or whether to examine just the riser welds or attempt to include the mixer, diffuser and

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adaptor welds, as well. These decisions depend on the final form of the BWRVIP jet pump assembly guidelines and vendor capabilities.

In accordance with recommendations in NUREG/CR-3052, Vermont Yankee also intends to perform ultrasonic inspection of the jet pump hold-down beams during the 1998 refueling outage.

Standby Liquid Control System

The BWRVIP Standby Liquid Control System Inspection and Flaw Evaluation Guidelines (BWRVIP-27) were published in April of 1997. Per the guidelines, the nozzle-to-safe end weld external to the vessel is the only inspection location (within the scope of the BWRVIP) which is critical to its function. The guidelines state, "A volumetric examination of the nozzle-to-safe end weld should be performed, if accessible, at the next outage when inspection tooling is available and appropriate pre-outage planning can be done." The BWRVIP Inspection Committee and EPRI are currently working on volumetric NDE techniques for these small diameter dissimilar metal welds, but it is not clear when a technique will be ready. Strategically, the examination will not be that difficult to perform, because it can be done in the drywell, presumably with a manual technique. Vermont Yankee intends to perform this examination if a technique is developed in time for the 1998 refueling outage. It should be noted that at Vermont Yankee the standby liquid control system safe end is low carbon (0.019%) stainless steel material, and thus not considered to be susceptible to IGSCC.

Summary

As described above and demonstrated by previous performance, Vermont Yankee believes in an aggressive and conservative approach to performing reactor vessel internals inspection and repair/replacement through prompt implementation of the BWRVIP emerging recommendations.