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June 5, 2003  
BVY 03-54

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

Subject: **Vermont Yankee Nuclear Power Station**  
**License No. DPR-28 (Docket No. 50-271)**  
**Supplement to Fourth-Interval Inservice Testing (IST) Program Plan**

On January 22, 2003, Vermont Yankee Nuclear Power Station (VY) submitted to the NRC a revised Inservice Testing (IST) Program as required by 10CFR50.55a(f)(4)(ii).

On May 19, 2003, a conference call was held between the NRC and VY regarding the above Program and Relief Request RR-P01 "Service Water Pump Testing." Based upon this conversation, VY has enhanced the justification of Relief Request RR-P01 by including the details of our Service Water Pump oil analysis program/process. This justification is documented in section 6 "Proposed Alternative and Basis for Use" of the attached Relief Request.

During the same conference call, a discussion was also held regarding the difficulties associated with testing the SW Pumps during the winter months. Section 4 "Impracticality of Compliance" of the attached Relief Request has been modified to capture the difficulties associated with winter flow rate testing.

The revised Relief Request RR-P01 is attached in total, with a revision bar indicating the location of the above discussed changes relative to that submitted on January 22.

If you have any questions on this transmittal, please contact Mr. Thomas B. Silko at (802) 258-4146.

Sincerely,

  
James M. DeVincentis  
Manager, Licensing

Attachment

cc: USNRC Region I Administrator  
USNRC Resident Inspector - VY  
USNRC Project Manager - VY  
Vermont Department of Public Service

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## SUMMARY OF VERMONT YANKEE COMMITMENTS

BVY NO.: 03-54

**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.**

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Docket No. 50-271  
BVY 03-54

**Attachment**

**Vermont Yankee Nuclear Power Station**

**Supplement to Fourth-Interval Inservice Testing (IST) Program Plan**

**Revised Relief Request RR-P01**

Based on the above, significant redesign and modification of the station Service Water System would be required to obtain direct measurement of pump flow. Such redesign and modification would be costly and burdensome to Vermont Yankee.

The Service Water system has a test flow loop, which is connected to the Fire Protection System header. This permits testing individual pumps, one at a time. However, this test loop does not provide Service Water flow to heat loads. Rather, the flow is discharged to the intake structure. The Service Water cross-tie valves must be shut, one Service Water subsystem is aligned to supply cooling water, and the other Service Water subsystem is aligned to the test loop. In the subsystem aligned to the test loop, one pump is stopped and the other is the pump under test. Therefore, to test one pump, it is necessary to provide all Service Water cooling loads with one subsystem, comprising two Service Water pumps. During approximately 7 months of the year, Connecticut River water temperatures preclude this method when the plant is operating, due to elevated heat sink temperatures and heat removal capacity. Therefore, this test loop cannot be regularly used for quarterly testing each quarter.

Testing during the remaining 5 months (approximately November through March) is impractical due to equipment concerns, personnel safety, and scheduling difficulty. Since the service water pump test requires taking each service water subsystem out of service, the test must be inserted into the 13-week schedule at a time that does not have an adverse impact on other scheduled work.

The process of realigning the service water system, isolating one subsystem, testing the off-line subsystem, unisolating the tested subsystem, realigning the service water system, isolating the other subsystem, testing the second subsystem, and recovery to the normal operating configuration takes a full shift in favorable weather. The test loop and instrumentation taps are outdoors on the service water pump room roof. If the weather is below freezing, the test cannot be performed due to instrumentation icing and the personnel safety concerns associated with severe cold weather. Therefore, a scheduled test might have to be cancelled at the last minute, disrupting the scheduled work week. The test would then have to be rescheduled for a subsequent week in another 13-week schedule.

Therefore, testing on-line is impractical due to equipment concerns, personnel safety, and scheduling difficulties.

## **5. Burden Caused by Compliance**

The burden imposed by compliance with the Code requirement would be a redesign of the Service Water system to provide a flow element and sufficient straight piping runs downstream of each Service Water pump. This system redesign would be so extensive that it could not be accomplished within the building that currently houses the Service Water pumps, since these straight piping runs would have to be approximately 12 feet long (10 pipe diameters for 14-inch pipe).

## **6. Proposed Alternative and Basis for Use**

A review of the historical test data for these pumps indicates that these pumps are highly reliable and have not been susceptible to frequent or unanticipated failures. Plant operating experience has shown that the performance of the Service Water pumps degrades slowly over an extended period due to normal system wear. During the 3<sup>rd</sup> Ten-Year Inservice Testing Interval, one Service Water pump was replaced, disassembled, and inspected each operating cycle, with each pump being replaced and inspected at least once every 6 years. The results of those inspections and replacements demonstrated that the service life of a Service Water pump is considerably greater than 6 years, and that pump performance can be reliably trended and predicted using data gathered during pump capacity testing performed each refueling outage. Therefore, replacement of Service Water pumps on a fixed interval is not proposed for this Relief Request. Service Water pumps will be replaced when periodic testing indicates that replacement is prudent.

During each refueling outage, a head-flow curve will be generated in accordance with ISTB-5210, and the pump comprehensive test will be performed in accordance with ISTB-5223. This will provide information so that the performance of the pump can be compared to the degree possible with the quarterly test data and previous refueling

outage head curve data. Overall peak and full spectrum vibration measurements will be also be taken at each of the points used to generate the head curve to provide additional operational information.

On a quarterly basis, a test will be performed by measuring pump differential pressure and motor vibration, and the data will be compared to the degree possible with the head-flow curve obtained during the refueling outage.

The Service Water pumps are in the Vermont Yankee Oil Analysis Program, described in station procedure DP 0213. Lube oil samples are taken quarterly from each service water pump. A complete laboratory analysis of the oil is performed, including wear particles, lubricity, additives, water, dirt (silicon), and oxidation. In addition, the oil in the Service Water pumps was changed to synthetic oil (SHC 630), due to the superior performance and service life of the synthetic oil.

#### **7. Duration of Proposed Alternative**

This relief is requested for the duration of the Vermont Yankee 4<sup>th</sup> Inservice Testing Ten-Year Interval (September 1, 2003 through August 31, 2013).

#### **8. Precedents**

A similar request was approved for the 3<sup>rd</sup> Ten-Year Interval (TAC No. M85067, dated September 3, 1993). This request differs from the one previously approved in that VY does not propose to disassemble and examine Service Water pumps on a fixed frequency, but rather as indicated by the results of periodic testing.