



# VERMONT YANKEE NUCLEAR POWER CORPORATION

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BVY 00-19

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

References: (a) NRC Administrative Letter 95-05, Revision 2, "Revisions to Staff Guidance For Implementing NRC Policy on Notices of Enforcement Discretion," dated July 27, 1999

**Subject: Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)  
Request for Enforcement Discretion Regarding Technical Specification  
Requirements for Partial Closure Testing of Main Steam Isolation Valve MSIV-80C**

This letter documents the basis for Vermont Yankee's request for enforcement discretion as discussed in our telecon of February 10, 2000. Enforcement discretion was requested and verbally granted on our plans to not complete Technical Specification (TS) Surveillance Requirement 4.7.D.1.d for MSIV-80C and for not entering the associated action statements TS 3.7.D.2 and TS 3.7.D.3.

Attachment 1 provides the information required by Reference (a) supporting the request. Attachment 2 provides the determination of no significant hazards consideration. Attachment 3 provides the marked-up pages from the current Technical Specifications showing the proposed changes that will be submitted to resolve this issue. The formal change to the Technical Specifications will be submitted on or before February 12, 2000.

We trust that the information provided adequately supports our request. However, should you have any questions or should you need to discuss this matter further, please contact Mr. Jim DeVincentis at (802) 258-4236.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

  
Samuel L. Newton  
Vice President of Operations

Attachments

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

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Docket No. 50-271  
BVY 00-19

Attachment 1

Vermont Yankee Nuclear Power Station

Request for Enforcement Discretion Regarding Technical Specification Requirement for  
Twice-Weekly Partial Closure Testing of Main Steam Isolation Valve MSIV-80C  
and not Implementing the Associated TS Action Statements

Supporting Information

## **1. Applicable Technical Specifications**

Vermont Yankee (VY) Technical Specification (TS) 4.7.D.1.d requires that, at least twice per week, the Main Steam Line Isolation Valves (MSIVs) be exercised by partial closure and subsequent reopening. This enforcement discretion request is needed because VY plans to not perform this surveillance test on one of the eight MSIVs (MSIV-80C) due to concerns that the surveillance could introduce an unnecessary plant transient. In addition, VY will not enter action statements TS 3.7.D.2 and TS 3.7.D.3 that are associated with not completing the surveillance.

## **2. Circumstances, Apparent Root Cause and Relevant Historical Events/Information**

### Circumstances

On January 17, 2000, during performance of the TS required partial closure test on MSIV-80C, operations personnel noticed that the time to return to the full open position seemed unusually long. This test was re-performed and the time to return to the full open position was observed to be normal (approximately 0.5 seconds). The next partial closure test, performed on January 20, 2000, also resulted in normal component response. A subsequent partial closure test performed on January 24, 2000, took approximately two seconds to return to the full open position instead of the approximately 0.5 seconds typical of the other seven MSIVs. Based on the noted observations, the condition was entered into the corrective action process. The next three partial closure tests were performed with normal results; however, during the test conducted on February 7, 2000 the time to return to the full open position was measured at approximately five seconds.

During this effort to trend the MSIV performance, assess the possible root causes and determine the appropriate corrective actions, a parallel effort to investigate removing this surveillance requirement from the TS was initiated. When it became apparent that the observed opening time appeared to be continuing to degrade and was somewhat erratic, an effort to accelerate the change to the TS and pursue enforcement discretion was initiated. VY believes that this is an emergent situation that warranted this course of action. The subject valve is located in Primary Containment and is not accessible for inspection or repair during station operation.

A review of the performance data revealed that all of the partial closure tests conducted since start up from RFO 21 in early December 1999 have satisfied the TS requirements to achieve partial closure and reopen. In addition, the time to achieve partial closure for MSIV-80C has remained consistent with the performance of the other seven MSIVs. It is only the partial opening time for MSIV-80C, that has been observed to be erratic during the twice-weekly surveillance. This opening function is not a safety function credited in the station safety analyses.

### Apparent Root Cause

The apparent root cause of the intermittent time to return to the full open position on MSIV-80C is a slow shifting or partial shifting of the 3-way valve on the actuator air control unit. The 3-way valve is installed solely for the purpose of performing the slow speed partial closure test by venting the underside piston air through an adjustable flow restriction and allowing the spring force to slowly close the MSIV. This 3-way valve is not used during the fast closure test or normal actuation of the MSIV. Fast closure of the MSIV is controlled through separate 2-way and 4-way valves. Additional investigation into the root causes of the observed condition will be performed as part of VY's corrective action process.

The fast closure requirements of TS 4.7.D.1.c were satisfactorily performed prior to start up from RFO 21 and again on February 9, 2000. Satisfactory performance of this test provides a high degree of confidence that the cause of the slow return to the full open position experienced during partial closure testing does not affect the ability of the MSIV to perform its safety function to close within 3 to 5 seconds.

A review of the potential root causes of the observed condition does not indicate that there are any common mode issues that would impact the components that support actuation of the MSIV closure to support performance of the credited safety function.

### Relevant Historical Events/Information

VY implemented a design change in 1986 to replace the original MSIV air control system with an improved design utilizing Norgren pilot-operated valves and ASCO solenoid valves. This change was followed by another design change in 1995 that changed the ASCO solenoid valves to a more reliable AVCO solenoid valve. These changes were implemented in response to industry problems associated with unexpected MSIV actuations resulting from air pilot valve failures. VY has not experienced any unexpected MSIV closure actuations since implementation of these design changes.

The requirement to exercise MSIVs twice weekly was originally intended to indirectly demonstrate that the MSIV pilot valve was not binding by exercising a test pilot valve of the same design. Those valves that were susceptible to binding have long since been replaced but the TS were never revised to remove the requirement for twice-weekly testing. Since the components that were susceptible to failure have been replaced and operating experience has demonstrated a high degree of reliability with the replacement components, this additional testing of the MSIVs provides no safety benefit. Therefore, not performing the surveillance on MSIV-80C is judged to have no safety impact.

Industry experience has shown that testing valves on a quarterly basis is adequate for ensuring that they will function as expected. Several utilities have subsequently implemented TS changes to relocate the testing requirements to the IST program and to conduct the surveillance on a quarterly basis.

Both General Electric and the MSIV air control system manufacturer have stated that the current partial closure surveillance frequency is excessive and can increase component wear without providing any additional assurance of valve operation.

### **3. Safety Basis for the Request and Qualitative Risk Assessment**

#### Safety Basis for the Request

The safety function of the MSIVs is to quickly isolate the main steam lines in the event of a postulated steam line break or control rod drop accident in order to limit the loss of reactor coolant and/or the release of radioactive materials. The MSIVs perform a safety function by mitigating the consequences of accidents; however, an operational transient can be initiated by the inadvertent closure of MSIVs.

The requirement to exercise MSIVs twice weekly was originally incorporated into the TS at the time VY was first licensed to operate. The purpose of this frequent, partial stroke test was to provide assurance that the valve actuator is operable and will function as intended when necessary. Because of a distinctive design, the earliest MSIV solenoid-operated pilot valves were susceptible to binding, that could compromise MSIV performance. To compensate for this potential, twice-weekly testing was conducted to provide assurance of valve reliability. The earlier design pneumatic control valves were replaced a number of years ago with those of a different manufacturer and different design. Long-term operating experience (VY and industry) has demonstrated superior reliability of the replacement components. The solenoid-operated pilot valves that were susceptible to binding were replaced, but the TS were not revised to eliminate the twice-weekly exercise of the MSIVs.

The MSIVs are spring-closing, pneumatic, piston-operated valves designed to automatically close (fail-safe) upon loss of pneumatic pressure to the valve operator. Solenoid-operated pilot valves control valve opening and closure. Directing pneumatic pressure to the valve operator to overcome the closing force exerted by the spring opens the MSIV, while either re-directed pneumatic pressure or spring force will close the MSIV.

Each of the eight (four inboard, four outboard) MSIVs is equipped with a Hiller model SA-A083 hydraulic actuator unit with an air control unit. Each air control unit consists of three solenoid-operated pilot valves that direct pneumatic pressure to the actuator piston. Using positioning control valves to direct nitrogen/air flow, individual MSIVs can be fast-closed or slow-closed as necessary during periodic testing.

VY TS 4.7.D.1.d requires that the MSIVs be exercised at least twice weekly by partial closure and reopening. This test entails a slow closure of each MSIV. The testing arrangement is designed to give a slow closure of the MSIV to avoid rapid changes in steam flow and nuclear system pressure, which could induce a transient condition. The control room operator performs the MSIV exercise test by manually depressing a pushbutton switch, which energizes a test pilot solenoid, causing a 3-way flow control valve to relieve pneumatic pressure from the actuator. As the MSIV slowly closes, the operator monitors the control room panel indicating lights to verify valve movement. When the MSIV is about 90% of full open, the operator releases the test pushbutton, reversing the flow control valve and causing the MSIV to return to the full open position.

One draw-back of the partial closure test is that it does not directly test the pilot valves used for fast closure of the MSIVs, but rather actuates a test pilot valve of the same manufacturer. This somewhat indirect indication of MSIV reliability is not as valid a test as the quarterly, full-stroke, fast-closure of the MSIVs since it does not activate the other pilot valves, nor does it test the full closure safety function of the MSIVs.

In addition to the twice-weekly exercise of MSIVs, they are subjected to a quarterly full, fast closure test as part of the VY In-service Testing (IST) program in accordance with TS 4.7.D.1.c and ASME Code Section XI requirements. Unlike the twice-weekly exercise, the quarterly surveillance tests the safety function of the valves and ensures that the closure times are within the limits assumed in station safety analyses. The quarterly, fast closure test is performed in a similar manner, except the MSIV fully closes in 3-5 seconds by de-energizing solenoids controlling the pilot valves. A review of the performance data for the last two operating cycles revealed that all eight MSIVs have consistently satisfied closure time requirements.

Based on the above, the capability of the MSIV-80C to perform its credited safety function is adequately tested and the requested action does not have any impact on the plant safety analyses.

The supplier of the MSIV actuator unit, Ralph A. Hiller Company, was recently contacted and does not currently recommend actuator testing at a frequency greater than the quarterly testing specified in the VY IST program and ASME Code.

### Qualitative Risk Assessment

From a probabilistic risk perspective, elimination of the twice-weekly partial stroke test on MSIV- 80C will not have a significant affect on VY's Core Damage Frequency (CDF) or Large Early Release Frequency (LERF). For most IPE scenarios of interest, the important function of the MSIVs is to remain open (transient events) or if closed, to eventually reopen to restore the condenser for decay heat removal. The IPE scenario where the MSIVs are modeled for closure is a steam line break in the Steam Tunnel or Turbine Building. The failure probability for MSIV failure-to-close is characterized using industry generic failure data for AOVs and SOVs. This data encompasses a range of test frequencies (typically monthly/quarterly), and therefore, was judged applicable to the MSIVs with or without the twice-week partial stroke test, providing that some testing is performed on a reasonable frequency (such as the quarterly full stroke test). VY is confident in the application of the generic data given the lack of VY specific failure history for the MSIVs. Also, the recent successful full stroke testing continues to support our confidence that the MSIVs will reliably perform.

Given that performance of the partial stroke test on MSIV-80C could introduce a larger issue such as a plant transient and quarterly testing provides reasonable confidence in the functional status of MSIV-80C, VY believes that there is a net safety benefit to not performing the twice-weekly test on MSIV-80C.

#### **4. No significant hazard consideration**

VY has concluded that this request does not involve a significant hazard consideration as defined in 10CFR50.92. Attachment 2 provides this assessment.

#### **5. Consequences to the environment**

VY has concluded that the proposed change does not involve adverse consequences to the environment. The current safety analyses, performed to evaluate the impact of station events on the environment, credits the full closure of the MSIV. The full closure capability of all MSIVs will continue to be tested. Partial closure is not credited in any station analysis performed to evaluate the impact of station events on the environment.

## **6. Compensatory Measure(s)**

No compensatory actions were necessary to support this request.

## **7. Duration of the noncompliance**

The enforcement discretion is requested until March 24, 2000 or until a permanent change to the Technical Specifications is approved and implemented.

This duration is justified since the requested action eliminates testing that is not necessary to support VY safety analyses and is being eliminated to minimize the potential for an inadvertent plant transient.

## **8. Plant On-site Review Committee approval**

This request has been approved by the VY Plant Operations Review Committee

## **9. NOED criteria**

VY is currently operating at full power. The NOED criterion that applies to the plant condition is B.2.1 (a). This criterion involves requests that are intended to avoid undesirable transients as a result of forcing compliance with the license condition and, thus, minimize potential safety consequences and operational risks.

## **10. Follow-up License Amendment**

Attachment 3 contains marked-up pages of the current VY Technical Specifications to illustrate the long term changes proposed that will eliminate the need for the requested enforcement discretion. It is VY's intention to propose elimination of the twice-weekly testing for all eight MSIV.

A separate license amendment request will be submitted by February 12, 2000.

## **11. Severe weather conditions or other natural events**

This request is not the result of unusual weather conditions or other natural events.

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Attachment 2

Vermont Yankee Nuclear Power Station

Request for Enforcement Discretion Regarding Technical Specification (TS) Requirement for  
Twice-Weekly Partial Closure Testing of Main Steam Isolation Valve MSIV-80C  
and not Implementing the Associated TS Action Statements

No Significant Hazard Determination

## Determination of No Significant Hazards Consideration

### Scope of the enforcement discretion request

The scope of the enforcement discretion request was to exercise discretion for VY's plans to not complete Technical Specification (TS) surveillance requirement 4.7.D.1.d, that requires twice-weekly partial closure testing of the Main Steam Isolation Valves, for one of the eight valves (MSIV-80C). Additionally, enforcement discretion was requested for not entering the associated action statement TS 3.7.D.2 and TS 3.7.D.3.

The twice-weekly test involves the partial closure of each MSIV to about the 90% open position and re-opening to the full open position. The twice-weekly test does not test the safety function of the MSIVs. The safety function is tested during the quarterly, full-stroke fast closure test. All of the MSIVs will continue to be tested quarterly in accordance with the In-service Testing program, and the twice-weekly test on the remaining seven MSIVs will continue to be performed

The safety function of the MSIVs is to quickly isolate the main steam lines in the event of a postulated steam line break or control rod drop accident to limit the loss of reactor coolant and/or the release of radioactive materials. The MSIVs perform a safety function by mitigating the consequences of accidents; however, an operational transient can be initiated by the inadvertent closure of MSIVs.

### Basis for no significant hazards determination:

Pursuant to 10CFR50.92, Vermont Yankee (VY) has reviewed the requested enforcement discretion and concludes that it does not involve a significant hazards consideration since the proposed change satisfies the criteria in 10CFR50.92(c).

1. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed enforcement discretion will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The frequency of MSIV testing is not assumed to be an initiator of any analyzed event. This change will not alter the operation of process variables, structures, systems, or components as described in the safety analyses. The twice-weekly exercising of MSIVs is not intended to verify the safety function of the MSIVs. The safety function testing will continue to be conducted during the quarterly, full-stroke fast closure MSIV test.

Not performing the twice-weekly MSIV test for MSIV-80C and not implementing the associated actions statements is not considered to have any measurable effect on the reliability of the MSIVs to perform their safety function, therefore the mitigating function of the MSIVs is maintained. The consequences of accidents previously evaluated will not be affected by this request because the surveillance requirement to test MSIVs in accordance with the IST programs and Section XI of the ASME Code will still be required to be performed. Industry operating experience has shown that testing the valves on a quarterly basis is adequate for ensuring the valves will close on demand.

These changes do not affect the initiation of any event, nor do they negatively impact the mitigation of any event. Therefore, the requested discretion does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed enforcement discretion will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The requested enforcement discretion does not affect any parameters or conditions that could contribute to the initiation of an accident. The request does not involve a physical alteration of the plant (no new or different type of equipment will be installed). No new accident modes are created since the manner in which the plant is operated is unchanged. The request does not affect the design or function of safety-related equipment. Therefore, requested discretion will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed enforcement discretion will not involve a significant reduction in a margin of safety.

Testing MSIV-80C by full stroke closure on a quarterly basis is adequate to maintain reliability of the MSIV to perform its safety function. This has been demonstrated through industry operating experience. Since frequency and method of MSIV testing is not specifically considered in any safety analysis, current safety analysis assumptions are being maintained. The reduction in testing from a twice-weekly exercise while maintaining the quarterly full-stroke test is adequate to maintain the reliability of this safety function while reducing needless valve wear and the potential for inducing an inadvertent transient. Consequently, margins of safety are maintained.

The requested enforcement discretion has no impact on equipment design or operation, and there are no changes being made to safety limits or safety system settings that would adversely affect plant safety as a result of the proposed changes. Since the request has no effect on any safety analysis assumption or initial condition, the margins of safety in the safety analyses are maintained. Therefore, the requested discretion does not involve a significant reduction in a margin of safety.

Summary No Significant Hazards Consideration:

On the basis of the above, VY has determined that operation of the facility in accordance with the scope of the requested enforcement discretion does not involve a significant hazards consideration as defined in 10CFR50.92(c), in that it: (1) does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) does not involve a significant reduction in a margin of safety.

In making this determination, Vermont Yankee has also reviewed the NRC examples of license amendments considered not likely to involve significant hazards considerations as provided in the final adoption of 10CFR50.92 published in the Federal Register, Volume 51, No. 44, dated March 6, 1986.

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Attachment 3

Vermont Yankee Nuclear Power Station

Request for Enforcement Discretion Regarding Technical Specification Requirement for  
Twice-Weekly Partial Closure Testing of Main Steam Isolation Valve MSIV-80C

Mark-up of Current Technical Specifications and Supporting Bases  
to reflect proposed long term changes

### 3.7 LIMITING CONDITIONS FOR OPERATION

5. Core spray and LPCI pump lower compartment door openings shall be closed at all times except during passage or when reactor coolant temperature is less than 212°F.

#### D. Primary Containment Isolation Valves

1. During reactor power operating conditions all containment isolation valves and all instrument line flow check valves shall be operable except as specified in Specification 3.7.D.2.

### 4.7 SURVEILLANCE REQUIREMENTS

5. The core spray and LPCI lower compartment openings shall be checked closed daily.

#### D. Primary Containment Isolation Valves

1. Surveillance of the primary containment isolation valves should be performed as follows:
  - a. The operable isolation valves that are power operated and automatically initiated shall be tested for automatic initiation and the closure times specified in Table 4.7.2 at least once per operating cycle.
  - b. Operability testing of the primary containment isolation valves shall be performed in accordance with Specification 4.6.E.
  - c. At least once per quarter, with the reactor power less than 75 percent of rated, trip all main steam isolation valves (one at a time) and verify closure time.

- d. At least twice per week, the main steam line isolation valves shall be exercised by partial closure and subsequent reopening.

BASES: 4.7 (Cont'd)

D. Primary Containment Isolation Valves

Those large pipes comprising a portion of the reactor coolant system whose failure could result in uncovering the reactor core are supplied with automatic isolation valves (except those lines needed for emergency core cooling system operation or containment cooling). The closure times specified herein and per Specification 4.6.E are adequate to prevent loss of more cooling from the circumferential rupture of any of these lines outside the containment than from a steam line rupture. Therefore, the isolation valve closure times are sufficient to prevent uncovering the core.

Purge and vent valve testing performed by Allis-Chalmers has demonstrated that all butterfly purge and vent valves installed at Vermont Yankee can close from full open conditions at design basis containment pressure. However, as an additional conservative measure, limit stops have been added to valves 16-19-7/7A, limiting the opening of these valves to 50° open while operating, as requested by NRC in their letter of May 22, 1984. (NVY 84-108)

In order to assure that the doses that may result from a steam line break do not exceed the 10CFR100 guidelines, it is necessary that no fuel rod perforation resulting from the accident occur prior to closure of the main steam line isolation valves. Analyses indicate the fuel rod cladding perforations would be avoided for the main steam valve closure times, including instrument delay, as long as 10.5 seconds. The test closure time limit of five seconds for these main steam isolation valves provides sufficient margin to assure that cladding perforations are avoided and 10CFR100 limits are not exceeded. Redundant valves in each line ensure that isolation will be effected applying the single failure criteria.

The main steam ~~line~~ isolation valves are ~~functionally tested on a more frequent interval to establish a high degree of reliability.~~

The containment is penetrated by a large number of small diameter instrument lines. The flow check valves in these lines are tested for operability in accordance with Specification 4.6.E.

*Primary containment isolation valves are tested in accordance with the requirements of the Inservice Testing program.*

