VERMONT YANKEE NUCLEAR POWER CORPORATION

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February 11, 2000
BVY 00-020

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)
Technical Specification Proposed Change No. 231
Main Steam Isolation Valve Surveillance Requirements

Pursuant to 10CFR50.90, Vermont Yankee (VY) hereby proposes to amend its Facility Operating License, DPR-28, by incorporating the attached proposed change into the VY Technical Specifications. The proposed amendment is requested to be processed as an "exigent" Technical Specification change in accordance with 10CFR50.91(a)(6) due to special circumstances currently existing at the Vermont Yankee Nuclear Power Station. The exigent circumstances involve testing of one main steam isolation valve (MSIV) and are further described in VY letter to NRC (BVY 00-019) dated February 11, 2000, concerning a Notice of Enforcement Discretion.

This proposed change deletes the requirement to exercise MSIVs twice weekly by partial closure and subsequent re-opening. Testing of the MSIVs to demonstrate their safety function will continue to be performed on a quarterly basis in accordance with the Vermont Yankee Inservice Testing program and applicable provisions of Section XI of the ASME Boiler and Pressure Vessel Code. This change to the Technical Specifications is consistent with the Standard Technical Specifications[1].

Beginning with partial closure testing performed on January 17, 2000, MSIV 80-C has exhibited slower than normal re-opening time during the test. Closing times and the quarterly full stroke testing of this MSIV in accordance with the inservice testing (IST) program have been acceptable. However, the re-opening time has continued to be erratic since the January 17 test and is trending up (i.e., taking longer to re-open). This is evidenced by two other tests indicating slower than expected re-opening times. If the MSIV were to fail to re-open and continue closing, a plant transient could result. Therefore, exigent circumstances exist because continued partial-closure testing of inboard MSIV 80-C has the potential to induce an operational transient, considering the probable degraded condition of its test pilot valve. The test pilot valve is not used to test the safety function of the MSIV; its use is required to perform the twice-weekly partial closure exercise of the MSIV.

Prior to January 17, 2000, there was no indication of degradation of MSIV partial-closure testing performance. A review of inservice testing data for all MSIVs since 1996 indicates all MSIVs have met acceptance criteria relative to demonstrating isolation (full closure) times within 3-5 seconds as required by Technical Specifications and assumed in accident analyses. VY could not have anticipated the need for processing this change under 10CFR50.91(a)(6) since the circumstance described above is recently occurring and is only evident in three recent partial-closure tests. The situation was unavoidable considering the past reliable performance of the MSIVs and their pneumatic actuators. The subject test pilot valve was refurbished in 1998 as part of scheduled preventive maintenance on the MSIV pneumatic

1 NUREG 1433, Revision 1, Standard Technical Specifications General Electric Plants, BWR/4, dated April 7, 1995

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actuator unit. Again, prior to January 17, 2000, VY had no indication of degradation of the suspected test pilot valve. All MSIVs continue to perform their safety function as demonstrated by acceptable full closure testing and VY believes the cause of the slower re-opening is limited to the test pilot valve, which will not prevent the MSIV from performing its safety function.

Attachment 1 to this letter contains supporting information and the safety assessment of the proposed change. Attachment 2 contains the determination of no significant hazards consideration. Attachment 3 provides the marked-up version of the current Technical Specification and Bases pages. Attachment 4 is the retyped Technical Specification and Bases pages.

VY has reviewed the proposed Technical Specification change in accordance with 10CFR50.92 and concludes that the proposed change does not involve a significant hazards consideration.

VY has also determined that the proposed change satisfies the criteria for a categorical exclusion in accordance with 10CFR51.22(c)(9) and does not require an environmental review. Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment needs to be prepared for this change.

Upon acceptance of this proposed change by the NRC, VY requests that a license amendment be issued for implementation within 30 days of the effective date of the amendment.

If you have any questions on this transmittal, please contact Mr. James M. DeVincentis at (802) 258-4236.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Samuel L. Newton
Vice President, Operations

STATE OF VERMONT)
)ss
WINDHAM COUNTY)

Then personally appeared before me, Samuel L. Newton, who, being duly sworn, did state that he is Vice President, Operations of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing document in the name and on the behalf of Vermont Yankee Nuclear Power Corporation, and that the statements therein are true to the best of his knowledge and belief.

Judith A. Harris, Notary Public
My Commission Expires February 10, 2003

JUDITH A. HARRIS NOTARY PUBLIC WINDHAM COUNTY, VERMONT

Attachments

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

VERMONT YANKEE NUCLEAR POWER CORPORATION

Docket No. 50-271
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Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 231

Main Steam Isolation Valve Surveillance Requirements

Supporting Information and Safety Assessment of Proposed Change

INTRODUCTION

The purpose of this proposed change is to delete Vermont Yankee (VY) Technical Specification (TS) Surveillance Requirement (SR) 4.7.D.1.d regarding exercising of main steam isolation valves (MSIVs). An associated change is made to Technical Specification Bases 4.7.D. The proposed change is consistent with industry practice and the BWR/4 Standard Technical Specifications (NUREG-1433, Rev. 1). Testing of MSIV safety function will continue to be conducted on a quarterly basis, consistent with other TS requirements, the VY Inservice Testing (IST) program, and Section XI of the ASME Boiler and Pressure Vessel Code.

SR 4.7.D.1.d requires:

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

This SR is no longer necessary to assure safe reactor operation and reliability of the MSIVs. MSIV testing will continue to be performed in accordance with SRs 4.7.D.1.a, 4.7.D.1.b, and 4.7.D.1.c.

BACKGROUND

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 indirect assurance that the valve actuator is operable and will function as intended when necessary. Because of a distinctive design, the former MSIV solenoid-operated pilot valves were susceptible to binding, which 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 since 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.

MSIV Design and Operation

The VY 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 a re-directed pneumatic pressure and/or spring force will close the MSIV.

Each of the eight (four inboard, four outboard) MSIVs is equipped with a Hiller model SA-A083 actuator unit (i.e., MSIV actuator). Each actuator 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.

Partial MSIV Closure Exercise

VY TS 4.7.D.1.d requires that the MSIVs be exercised at least twice weekly by partial closure and re-opening. This test entails a slow, partial 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 slowly 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 still 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 drawback of the partial closure test is that it does not directly test the (2-way and 4-way) 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 isolation safety function of the MSIVs.

Full Closure MSIV Testing

In addition to the twice-weekly exercise of MSIVs, they are subjected to a full, fast closure test quarterly as part of the VY IST program in accordance with TS SRs 4.7.D.1.a, 4.7.D.1.b, and 4.7.D.1.c, incorporating ASME Code Section XI requirements. Unlike the twice-weekly exercise, this quarterly surveillance tests the safety function of the valves and ensures that the closure times are within the limits of operability for the MSIVs as specified in TS Table 4.7.2 and assumed in VY accident analyses.

SAFETY ASSESSMENT

The proposed change will eliminate the requirement to exercise the MSIVs twice weekly.

Bases for the Change:

The requirement to exercise MSIVs twice weekly is unnecessary based on the design and reliability of components in the MSIV actuator. This test was originally instituted based on a concern with the reliability of MSIV actuator components. However, 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 exercise testing of the MSIVs is no longer warranted. Indeed, continued twice-weekly MSIV testing may be contrary to safety and reliability goals since unnecessary testing may lead to premature equipment wear while exposing the reactor to potential operational transients because of the testing.

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

Any binding of the solenoid-operated pilot valves or other problems with the MSIVs should be identified during the quarterly surveillance. However, since the earlier model components were replaced, operating experience supports elimination of the twice-weekly testing requirement.

The BWR/4 Standard Technical Specifications (STS) (NUREG 1433, Rev. 1) notes that MSIVs should be tested in accordance with the plant's Inservice Testing Program. The STS do not contain requirements to perform MSIV exercising or testing at a greater frequency. Industry operating experience has shown that testing the valves on a quarterly basis is adequate for ensuring the MSIVs will close on demand, fulfilling their safety function. Furthermore, decreasing the MSIV test frequency reduces wear, which is caused by more frequent testing.

This reduction in testing is supported by NRC's position regarding NUREG-0737, Item II.K.3.16, which provided recommendations to reduce the frequency of challenges to safety relief valves. One of the recommendations was to reduce the frequency of testing MSIVs. Partial-stroke exercising of MSIVs can result in a transient if, for example, a test circuit malfunction causes the tested MSIV to fully close. Because the partial-stroke exercise tests are usually performed during full power operation, the resulting transient could involve reactor trips and challenge safety systems. By testing according to the approved IST program, the potential for this type of plant transient is reduced.

The requirements of TS SRs 4.7.D.1.a, 4.7.D.1.b and 4.7.D.1.c are adequate to ensure operability of the MSIVs and SR 4.7.D.1.d can be eliminated from TS.

Finally, a conforming change is being made to TS Bases 4.7.D by changing the sentence, "The main steam line isolation valves are functionally tested on a more frequent interval to establish a high degree of reliability." to "The main steam isolation valves are primary containment isolation valves and are tested in accordance with the requirements of the Inservice Testing program."

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Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 231

Main Steam Isolation Valve Surveillance Requirements

Determination of No Significant Hazards Consideration

Determination of No Significant Hazards Consideration

Description of amendment request:

This proposed change deletes the requirement to exercise main steam isolation valves (MSIVs) twice weekly.

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 purpose of the twice-weekly test is not to test the safety function of the MSIVs, but to provide assurance of reliable MSIV operation because of a component that was susceptible to failure. That particular component has been replaced by one of a more reliable design, which has demonstrated reliable performance. The MSIV isolation safety function is tested during the quarterly, full-stroke, fast closure test. The MSIVs will continue to be tested quarterly in accordance with the Inservice Testing program.

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.

NRC has previously found, in other applications, the acceptability of removing the identified requirement from the Technical Specifications. The requirement for twice-weekly testing is not required to provide adequate protection of the public health and safety.

Basis for no significant hazards determination:

Pursuant to 10CFR50.92, Vermont Yankee (VY) has reviewed the proposed change and concludes that the change 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 amendment 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 basic operation of process variables, structures, systems, or components as described in the safety analyses. The twice-weekly exercise 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. However, eliminating unnecessary testing of the MSIVs may reduce the probability of occurrence of an inadvertent valve closure that could lead to a plant transient condition.

Deleting the twice-weekly MSIV test 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 change because the surveillances to test MSIVs in accordance with the IST program and Section XI of the ASME Code will still be performed, assuring that MSIVs will perform their intended safety function.

Since reactor operation with the deleted surveillance specification is fundamentally unchanged, no design or analytical acceptance criteria will be exceeded. As such, this change does not impact initiators of analyzed events nor assumed mitigation of design basis accident or transient events.

These changes do not affect the initiation of any event, nor do they negatively impact the mitigation of any event. Therefore, the proposed changes do 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 amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change does not affect any parameters or conditions that could contribute to the initiation of an accident. The proposed change 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 fundamentally unchanged. This change to surveillance requirements does not affect the design or function of safety-related equipment, nor does it eliminate testing to verify a safety function. Therefore, the proposed changes 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 amendment will not involve a significant reduction in a margin of safety.

Testing the MSIVs by full stroke closure on a quarterly basis is adequate to maintain reliability of the MSIVs to perform their safety function. This has been demonstrated through industry operating experience. Since frequency or 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 (partial closure and re-opening) while maintaining the quarterly full-stroke test is adequate to maintain the reliability of this safety function while reducing unnecessary valve wear and the potential for inducing an inadvertent transient. Consequently, margins of safety are maintained.

There is 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 because of the proposed changes. Since the changes have no effect on any safety analysis assumption or initial condition, the margins of safety in the safety analyses are maintained.

Summary No Significant Hazards Consideration:

On the basis of the above, VY has determined that operation of the facility in accordance with the proposed change 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

Proposed Technical Specification Change No. 231

Main Steam Isolation Valve Surveillance Requirements

Marked-up Version of the Current Technical Specifications

3.7 LIMITING CONDITIONS FOR OPERATION	4.7 SURVEILLANCE REQUIREMENTS
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.	5. The core spray and LPCI lower compartment openings shall be checked closed daily.
D. Primary Containment Isolation Valves	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.	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.

The main steam isolation valves are primary containment isolation valves and are tested in accordance with the requirements of the Inservice Testing program.

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Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 231

Main Steam Isolation Valve Surveillance Requirements

Retyped Technical Specification Pages

Listing of Affected Technical Specifications Pages

Replace the Vermont Yankee Nuclear Power Station Technical Specifications pages listed below with the revised pages. The revised pages contain vertical lines in the margin indicating the areas of change.

Remove	Insert
156	156
171	171

3.7 LIMITING CONDITIONS FOR OPERATION	4.7 SURVEILLANCE REQUIREMENTS
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.	5. The core spray and LPCI lower compartment openings shall be checked closed daily.
D. Primary Containment Isolation Valves	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.	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.

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.

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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 isolation valves are primary containment isolation valves and are tested in accordance with the requirements of the Inservice Testing program.

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.