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NUCLEAR POWER CORPORATION

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November 1, 2000
BVY 00-101

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. 240
High Pressure Core Cooling Systems Isolation Function

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 change represents revisions to the Limiting Conditions for Operation (LCO) and clarifies the description of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) low steam supply pressure isolation function. Additionally, an administrative change to correct HPCI differential pressure instrumentation component identification is proposed.

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 showing the change requested. Attachment 4 contains 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 also believes 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 by March, 2001 for implementation within 60 days of its effective date.

If you have any questions concerning this transmittal, please contact Mr. Brian Hobbs at (802) 258-4116.

A001

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Michael A. Balduzzi
Vice President, Operations

STATE OF VERMONT)
)ss
WINDHAM COUNTY)

Then personally appeared before me, Michael A. Balduzzi, 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.

Sally A. Sandstrum, Notary Public
My Commission Expires February 10, 2003

NOTARY PUBLIC

Attachments

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

Docket No. 50-271
BVY 00-101

Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 240

High Pressure Core Cooling Systems Isolation Function

Supporting Information and Safety Assessment of Proposed Change

DESCRIPTION OF CHANGE

Vermont Yankee (VY) proposes to change the Technical Specifications (TS) to revise the Limiting Conditions for Operation (LCO) and clarify the purpose of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) low steam supply pressure isolation function. Specification 3.2.B requires that when primary containment integrity is required, the instrumentation that initiates primary containment isolation shall be operable in accordance with TS Table 3.2.2. This Table contains the applicable operability requirements for the affected HPCI and RCIC system isolation instrumentation. The instrumentation listed is associated with the following trip functions:

High Steam Line Space Temperature
High Steam Line d/p
Low Steam Supply Pressure
Main Steam Line Tunnel Temperature

The low steam supply pressure isolation signals primarily provide an equipment protection function. However, they also provide a diverse signal to indicate a possible system break (see "Reason for Change", below). The instrumentation that initiates this isolation function is needed when the associated systems are required to be operable. New Note 13 is being added to Table 3.2.2 to associate the low pressure trip function instrumentation with system operability for this single trip system. Reference to Note 13 will replace reference to Note 12 for these instruments. Note 13 will specify actions to be taken in the event of loss of isolation function or loss of one or more instrument channels. TS 3.2 Bases is being revised to clarify the purpose of the low steam supply pressure isolation function.

An administrative change to correct the HPCI High Steam Line d/p instrument component identification on Table 3.2.2 is also proposed.

Proposed Change

Page 46, Table 3.2.2. Delete reference to Note 12 and add reference to new Note 13 under the Minimum Number of Operable Instrument Channels per Trip System column for the Low HPCI Steam Supply Pressure trip function. Correct the referenced instrument numbers for the second line item, High Steam Line d/p from "DPIS-23-77/78" to "DPIS-23-76/77."

Page 47, Table 3.2.2. Delete reference to Note 12 and add reference to new Note 13 under the Minimum Number of Operable Instrument Channels per Trip System column for the Low RCIC Steam Supply Pressure trip function.

Page 48, Table 3.2.2 Notes. Add new Note 13 as follows:

13. Whenever the High Pressure Cooling Injection System and Reactor Core Isolation Cooling System are required to be operable in accordance with Specification 3.5, the low steam supply pressure automatic isolation trip system shall be operable, except as provided below:

A. With the automatic isolation trip function not maintained, restore isolation capability within 1 hour or take the ACTION required by Table 3.2.2.

B. With one or more required channels inoperable, place the inoperable channel(s) in the tripped condition within 24 hours or take the ACTION required by Table 3.2.2.

Specification 3.2 Bases, page 77. Delete "...steam supply pressure," from the second paragraph, first sentence. Add the following new second through fifth sentences to the second paragraph:

The HPCI and RCIC steam supply pressure instrumentation is provided to isolate the systems when pressure may be too low to continue operation. These isolations are for equipment protection. However, they also provide a diverse signal to indicate a possible system break. These instruments are included in Technical Specifications because of the potential for possible system initiation failure if not properly tested.

REASON FOR CHANGE

This change is necessary to allow reactor heatup with the HPCI and RCIC steam supply line isolation valves open and correct HPCI differential pressure instrument component identification. This will: 1) eliminate the need to administratively control the opening of manual containment isolation valves for the purpose of equalizing pressure around the HPCI and RCIC steam supply line isolation valves prior to placing the systems in service, 2) clarify the purpose of the HPCI and RCIC low steam supply pressure isolation function, and 3) provide accurate identification of HPCI differential pressure instruments.

Background

The HPCI system is provided to assure that the reactor core is adequately cooled in the event of a small break in the nuclear system -- the postulated loss of coolant accident which does not result in rapid depressurization of the reactor vessel. The HPCI system is designed to operate until reactor vessel pressure is below the value at which low pressure systems can maintain core cooling. The RCIC system provides makeup water to the reactor vessel following a reactor vessel isolation event when normal sources of feedwater are not available.

The HPCI and RCIC systems each consist of a steam turbine driving a flow-controlled pump with associated system piping, controls, and instrumentation. Vermont Yankee Technical Specifications 3.5.E and 3.5.G respectively require that HPCI and RCIC be operable whenever reactor pressure is greater than 150 psig and irradiated fuel is in the reactor vessel.

The HPCI steam supply line has two containment isolation valves; V23-15 (inboard) and V23-16 (outboard). The RCIC steam supply line isolation valves are V13-15 (inboard) and V13-16 (outboard). These valves are normally open when the system is required to be operable, in order to facilitate prompt initiation of core cooling, if needed. The valves serve a containment isolation function, with automatic closure on indication of a steam supply line break to ensure 10CFR100 limits are met. As primary containment isolation valves, operability in accordance with TS 3.7.D is required.

Primary containment integrity is required at all times when the reactor is critical or when reactor water temperature is >212°F, in accordance with TS 3.7.A.2. The TS definition of primary

containment integrity in Section 1.0 includes item N.3; "All automatic containment isolation valves are operable or deactivated in the isolated position."

The primary method for detection of a HPCI/RCIC steam line break outside containment is provided by temperature sensors in the HPCI/RCIC equipment area, temperature sensors in the main steam tunnel and/or steam line differential pressure switches upstream of the inboard isolation valves. High area temperature indication is the primary means of detecting a steam line break. Automatic closure of the isolation valves prevents the excessive loss of reactor coolant and the release of radioactive materials from the nuclear system process barrier.

The VY design basis specifies that these valves also provide an isolation function to protect the HPCI or RCIC systems against operation at low steam supply pressures. The isolation signal is designated by General Electric (GE) as "Reactor Vessel Pressure Low Enough to Discontinue HPCI or RCIC." GE design basis documentation states that although a steam line break upstream of the differential pressure sensing point may initiate a low pressure isolation signal, the primary reason for this signal is to provide HPCI/RCIC turbine isolation when pressure is so low they serve no useful function. Four pressure switches located upstream of the inboard isolation valves initiate the low pressure isolation signal. Logic for the isolation function is provided by a single trip system, configured in 1-out-of-2-twice arrangement.

The VY design basis is consistent with NUREG-1433, Revision 1, Section B 3.3.6.1, which discusses the bases for the HPCI/RCIC low steam supply pressure isolation signal. The NUREG states that low main steamline pressure indicates that the pressure of the steam in the HPCI or RCIC turbine may be too low to continue operation of the associated system's turbine. These isolations are for equipment protection and are not assumed in any transient or accident analysis. The NUREG also states that the instruments provide a diverse signal to indicate a possible system break.

The administrative change corrects the referenced instrument numbers in Table 3.2.2 for HPCI High Steam Line d/p. This error was introduced by Amendment 164 when instrument numbers were added to this and other TS Tables. The instrument numbers were added to assist technicians in identifying the appropriate instrument for the function specified in the Tables. Procedures have and continue to reflect the correct instruments and this was a typographical error when our amendment request was previously submitted. No changes in plant equipment or function are involved with this change.

Current Application of Technical Specifications

Current VY Technical Specification 3.2.B specifies that when primary containment integrity is required, the instrumentation that initiates primary containment isolation shall be operable in accordance with Table 3.2.2. The HPCI and RCIC low steam supply pressure trip functions and associated instruments are listed in Table 3.2.2 under the respective headings of High Pressure Coolant Injection Isolation Instrumentation and Reactor Core Isolation Cooling Isolation Instrumentation. The instruments listed in Table 3.2.2 under these headings are considered by VY to initiate primary containment isolation and therefore are required to be operable whenever primary containment integrity is required.

During reactor heatup and in accordance with current VY procedures, the HPCI/RCIC steam supply line isolation valves are closed until reactor pressure is greater than 140 psig and prior to exceeding 150 psig, when the HPCI and RCIC systems are placed in service. The steam supply

line isolation valves are opened in conjunction with placing the system in service. Prior to opening the isolation valves, pressure in the line is equalized to within 50 psid to avoid the potential for automatic isolation on high differential pressure. Pressure equalization is accomplished by sending an operator into the steam tunnel to open manual valves and establish a lineup that gradually pressurizes the line, which can take 30-45 minutes. These manual valves are primary containment isolation valves, allowed to be opened intermittently under administrative controls in accordance with the TS definition of primary containment integrity. The applicable procedure specifies that the operator stay in the immediate vicinity of the valve controls in communication with the Control Room, to close the valves in the event primary containment isolation is required.

TS Table 3.2.2 provides a list of HPCI/RCIC System Isolation Instrumentation, including instruments associated with the following trip functions:

High Steam Line Space Temperature
High Steam Line d/p
Low Steam Supply Pressure
Main Steam Line Tunnel Temperature

Table 3.2.2 specifies that the minimum number of operable instrument channels for the low steam supply pressure trip function is four. Notes 5, 11 and 12 are referenced in association with the minimum trip channel requirement. Note 5 describes the single trip system, one-out-of-two-twice logic arrangement for the low pressure trip function. Note 11 specifies allowable out of service time for surveillance purposes. Note 12 provides actions to be taken in the event of a loss of isolation function or inoperable instrument channels, when containment integrity is required.

Basis for Proposed Change

Based on the information presented above, VY proposes to revise TS Table 3.2.2 to associate operability of the HPCI/RCIC low steam supply pressure instrumentation with system operability and to clarify that the low pressure isolation is primarily intended for equipment protection purposes.

The operability of instrumentation associated with the HPCI/RCIC low steam supply pressure will be required when HPCI/RCIC system operability is required in accordance with TS 3.5, per Table 3.2.2 new Note 13. This will ensure isolation of the steam supply lines to protect the HPCI/RCIC systems from operation at low pressure. New Note 13 to Table 3.2.2 will also specify the actions to take for this single trip system in the event of loss of isolation function or inoperable instrument channels. New Note 13 is as restrictive as Note 12 in terms of allowable time to restore instrument channel operability and isolation function. It is also consistent with NUREG-1433, Revision 1, Section 3.3.6.1 actions.

The operability of instrumentation associated with the HPCI/RCIC equipment area temperature, main steam tunnel temperature and steam line differential pressure will continue to be required when primary containment is required, per Table 3.2.2 Note 12. This will ensure that in the event of an accident, automatic closure of the isolation valves will prevent the excessive loss of reactor coolant and the release of radioactive materials from the nuclear system process barrier.

SAFETY ASSESSMENT

The proposed change does not significantly affect the ability of the primary containment isolation or high pressure core cooling systems to perform their required safety functions. The HPCI steam line isolation valves are normally open when system operability is required; whenever reactor pressure is greater than 150 psig and irradiated fuel is in the vessel. The proposed change will allow the valves to be open during reactor heatup, between 212°F and 150 psig, a duration of typically less than two hours. Low steam supply pressure is a normal condition during this period. The likely probability of a steam line break outside containment during this time is low due to the typically limited duration of operation in this condition. The likely consequence of a steam line break outside containment during this time is low due to the low steam pressure available to drive a release.

If an isolation signal associated with the steam line break outside containment (e.g. high area temperature, high differential pressure) is received during this period of reactor heatup, the valves will automatically isolate within the allowable closure times. The capability for remote manual closure of these valves from the Control Room will also be available in the event primary containment isolation is necessary during reactor heatup between 212°F and 150 psig. This will meet the TS requirement for primary containment integrity and ensure 10CFR100 limits are not exceeded for a steam supply line break outside containment.

The VY accident analysis evaluates steam line breaks outside containment, and considers HPCI and RCIC steam line break scenarios. These postulated line breaks are bounded by the design basis accident of a complete severance of one main steam line outside secondary containment. VY UFSAR Section 14.6 describes the results of the main steam line break accident analysis and concludes that radiological exposures are well below 10CFR100 limits. The analysis is unaffected by this proposed change. It is reasonable to assume that a HPCI or RCIC steam line break that occurred during reactor conditions of between 212°F and 150 psig, would result in either (1) an automatic isolation on high area temperature or high d/p, or (2) operator action to manually isolate the line before the total mass of reactor coolant released exceeded that assumed in the bounding main steam line break accident analysis.

VY has also performed HPCI and RCIC high energy line break (HELB) analyses to determine the environmental and energy release impacts of a steam line break. These HELB analyses assume the line break occurs when the reactor is at rated pressure - a worst case condition, which bounds a break at lower pressures. Having the steam line isolation valves open between 212°F and 150 psig does not change the assumptions or results of the HELB analyses.

These HPCI and RCIC steam supply pressure instruments will continue to be included in Technical Specifications because of the potential for possible system initiation failure if not properly tested. The failure of these instruments to operate within their required range (i.e. isolation signal trip setting drifting to >200 psig) could prevent HPCI and RCIC operation when needed for core cooling. Such a failure would not impact containment isolation capability or the ability to maintain containment integrity.

Correct identification of HPCI High Steam Line d/p instrument component numbers will ensure accuracy of isolation instrumentation information.

Summary

In summary, the addition of TS Table 3.2.2 Note 13 and replacement of Note 12 revises the operability requirement for HPCI and RCIC low steam line pressure isolation instrumentation to coincide with system operability requirements. This allows reactor heatup with the steam line isolation valves open and eliminates the need to open manual containment isolation valves under administrative control for the purpose of pressure equalization. The proposed change does not significantly reduce the margin of safety for the HPCI or RCIC containment isolation function.

Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 240

High Pressure Core Cooling Systems Isolation Function

Determination of No Significant Hazards Consideration

Determination of No Significant Hazards Consideration

Description of Amendment Request:

This proposed change adds Technical Specification Table 3.2.2 Note 13 as replacement for Note 12 to revise the operability requirement for HPCI and RCIC low steam line pressure isolation instrumentation to coincide with system operability requirements. This change eliminates the need to open manual containment isolation valves under administrative control during reactor heatup, reduces the potential for operator error when closing these valves (potential for leaving valve mispositioned) and clarifies the steam line low pressure isolation function description. The administrative change to correct HPCI High Steam Line d/p instrument component numbers will ensure accuracy of isolation instrumentation information.

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 the 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 proposed change clarifies the equipment protection purpose of the HPCI and RCIC low steam line isolation function. It allows operability of the steam supply pressure instrumentation to be required whenever the systems are required to be operable. This change does not significantly alter the function of containment isolation actuation instruments nor does it significantly alter containment integrity requirements. The proposed change does not alter the basic operation of process variables, systems, or components as described in the safety analysis. No new equipment is being introduced.

   The proposed change does not affect the ability of the primary containment isolation system or high pressure core cooling systems to perform their safety functions. The essential safety function of providing primary containment integrity is maintained since operability of the primary instrumentation associated with detection of a HPCI or RCIC steam line break outside containment will continue to be required when primary containment integrity is required. The essential safety function of providing water to cool the core in the event of a small break in the nuclear system is maintained. The operational change being made would not alter the sequence of events, plant response, or conclusions of existing safety analyses. This proposed change results in no impact on analyzed accident event precursors, initiators or effects.

   Therefore, the proposed change 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 amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change does not involve any physical alteration of plant equipment and does not change the method by which any safety-related system performs its function. No new or different types of equipment will be installed. Operation with the HPCI and RCIC steam line isolation valves open between 212°F and 150 psig does not alter the input or result of existing accident analyses. The change in plant operation does not involve failure modes other than those previously evaluated. The methods governing plant operation and testing remain consistent with current safety analysis assumptions.

Therefore, the proposed change 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.

The change involves operation with the HPCI and RCIC systems with steam line isolation valves open between 212°F and 150 psig. This change will not alter the basic operation of process variables, systems, or components as described in the safety analysis. No new equipment is introduced.

The proposed change maintains design margins of the primary containment isolation system or high pressure core cooling systems to perform their required safety functions. The essential safety functions of providing primary containment integrity and providing water to cool the core in the event of a small break in the nuclear system are maintained. There is no physical or operational change being made which would alter the sequence of events, plant response, or margins in existing safety analyses. This proposed change results in no impact on analyzed accident event precursors or effects.

This proposed change does not alter the physical design of the plant. The change in method of operation results in no significant impact on safety functions or assumed responses. The proposed change does not alter the means by which primary containment isolation is maintained and high pressure core cooling systems are operated.

Therefore, the proposed change does not involve a significant reduction in the margin of safety.

Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 237

Proposed Technical Specification Change No. 240

Marked-up Version of the Current Technical Specifications

TABLE 3.2.2
(Cont'd)

HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Level Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
2 per set of 4 (Notes 11,12)	High Steam Line Space Temperature (TS-23-(101-104)(B-D))	≤212°F	Note 3
1 (Notes 11,12)	High Steam Line d/p (Steam Line Break) (DPIS-23-~~77/78~~ 76/77)	≤195 inches of water	Note 3
4 (Notes 5,11,12)	Low HPCI Steam Supply Pressure (PS-23-68(A-D))	≥70 psig	Note 3
2 (Notes 11,12)	Main Steam Line Tunnel Temperature (TS-23-(101-104)A)	≤212°F	Note 3
1 (Notes 11,12)	Time Delay (23A-K48) (23A-K49)	≤35 minutes	Note 3
1	Trip System Logic	--	Note 3

13

TABLE 3.2.2
(Cont'd)

REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Level Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
2 (Notes 11,12)	Main Steam Line Tunnel Temperature (TS-13-(79-82)A)	≤212°F	Note 3
1 (Notes 11,12)	Time Delay (13A-K41) (13A-K42)	≤35 minutes	Note 3
2 per set of 4 (Notes 11,12)	High Steam Line Space Temperature (TS-13-(79-82)(B,C,D))	≤212°F	Note 3
1 (Notes 11,12)	High Steam Line d/p (Steam Line Break)(DPIS-13-83/84)	≤195 inches of water	Note 3
4 (Notes 5,11,12)	Low Steam Supply Pressure (PS-13-87(A-D))	≥50 psig	Note 3
1	Trip System Logic	--	Note 3
1 (Notes 11,12)	Time Delay (13A-K7) (13A-K31)	3≤ t ≤7 seconds	Note 3

13

TABLE 3.2.2 NOTES

1. The main steam line low pressure need be available only in the "Run" mode.

2. If the minimum number of operable instrument channels are not available for one trip system, that trip system shall be tripped. If the minimum number of operable instrument channels are not available for both trip systems, the appropriate actio[illegible]

   A. Initia[illegible] [illegible]hutdown co[illegible]

13. Whenever the High Pressure Cooling Injection System and Reactor Core Isolation Cooling System are required to be operable in accordance with Specification 3.5, the low steam supply pressure automatic isolation trip system shall be operable, except as provided below:

    A. With the automatic isolation trip function not maintained, restore isolation capability within 1 hour or take the ACTION required by Table 3.2.2.

    B. With one or more required channels inoperable, place the inoperable channel(s) in the tripped condition within 24 hours or take the ACTION required by Table 3.2.2.

10. A key [illegible] [illegible]ction to enable pl[illegible] [illegible]greater than 12 inches Hg a[illegible] [illegible]ypass valves are closed.

11. When a channel, and/or the affected primary containment isolation valve, is placed in an inoperable status solely for performance of required instrumentation surveillances, entry into associated Limiting Conditions for Operation and required ACTIONS may be delayed for up to 6 hours provided the associated Trip Function maintains isolation capability.

12. Whenever Primary Containment integrity is required by Specification 3.7.A.2, there shall be two operable or tripped trip systems for each Trip Function, except as provided for below:

    A. With one or more automatic functions with isolation capability not maintained restore isolation capability in 1 hour or take the ACTION required by Table 3.2.2.

    B. With one or more channels inoperable, place the inoperable channels (s) in the tripped condition within:

       1) 12 hours for trip functions common to RPS instrumentation, and
       2) 24 hours for trip functions not common to RPS instrumentation,

       or, initiate the ACTION required by Table 3.2.2.

BASES: 3.2 (Cont'd)

control and/or bypass valves to open, resulting in a rapid depressurization and cooldown of the reactor vessel. The 800 psig trip setpoint limits the depressurization such that no excessive vessel thermal stress occurs as a result of a pressure regulator malfunction. This setpoint was selected far enough below normal main steam line pressures to avoid spurious primary containment isolations.

Low condenser vacuum has been added as a trip of the Group 1 isolation valves to prevent release of radioactive gases from the primary coolant through condenser. The setpoint of 12 inches of mercury absolute was selected to provide sufficient margin to assure retention capability in the condenser when gas flow is stopped and sufficient margin below normal operating values.

The HPCI and/or RCIC high flow, steam supply pressure, and temperature instrumentation is provided to detect a break in the HPCI and/or RCIC piping. Tripping of this instrumentation results in actuation of HPCI and/or RCIC isolation valves, i.e., Group 6 valves. A time delay has been incorporated into the RCIC steam flow trip logic to prevent the system from inadvertently isolating due to pressure spikes which may occur on startup. The trip settings are such that core uncovering is prevented and fission product release is within limits.

The instrumentation which initiates ECCS action is arranged in a dual channel system. Permanently installed circuits and equipment may be used to trip instrument channels. In the nonfail safe systems which require energizing the circuitry, tripping an instrument channel may take the form of providing the [illegible] permanently installed circuits. [illegible] ic circuits with the a[illegible] which w[illegible]

1

The HPCI and RCIC steam supply pressure instrumentation is provided to isolate the systems when pressure may be too low to continue operation. These isolations are for equipment protection. However, they also provide a diverse signal to indicate a possible system break. These instruments are included in Technical Specifications because of the potential for possible system initiation failure if not properly tested.

[illegible] in ac[illegible] This adjustm[illegible] and two loop drive flow a[illegible] of safety is not reduced during [illegible]

The purpose of the APRM rod block function is to avoid conditions that would require Reactor Protection System action if allowed to proceed. The APRM upscale rod block alarm setting is selected to initiate a rod block before the APRM high neutron flux scram setting is reached. The APRM upscale rod block trip setpoint is varied as a function of reactor recirculation flow. The slope of the rod block trip response curve with recirculation flow is adjustable to allow tracking of the required trip setpoint with

Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 240

High Pressure Core Cooling Systems Isolation Function

Retyped Technical Specification Pages

Listing of Affected Technical Specification 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
46	46
47	47
- -	48a
77	77

TABLE 3.2.2
(Cont'd)

HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Level Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
2 per set of 4 (Notes 11,12)	High Steam Line Space Temperature (TS-23-(101-104)(B-D))	≤212°F	Note 3
1 (Notes 11,12)	High Steam Line d/p (Steam Line Break) (DPIS-23-76/77)	≤195 inches of water	Note 3
4 (Notes 5,11,13)	Low HPCI Steam Supply Pressure (PS-23-68(A-D))	≥70 psig	Note 3
2 (Notes 11,12)	Main Steam Line Tunnel Temperature (TS-23-(101-104)A)	≤212°F	Note 3
1 (Notes 11,12)	Time Delay (23A-K48) (23A-K49)	≤35 minutes	Note 3
1	Trip System Logic	--	Note 3

TABLE 3.2.2
(Cont'd)

REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Level Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
2 (Notes 11,12)	Main Steam Line Tunnel Temperature (TS-13-(79-82)A)	≤212°F	Note 3
1 (Notes 11,12)	Time Delay (13A-K41) (13A-K42)	≤35 minutes	Note 3
2 per set of 4 (Notes 11,12)	High Steam Line Space Temperature (TS-13-(79-82)(B,C,D))	≤212°F	Note 3
1 (Notes 11,12)	High Steam Line d/p (Steam Line Break)(DPIS-13-83/84)	≤195 inches of water	Note 3
4 (Notes 5,11,13)	Low Steam Supply Pressure (PS-13-87(A-D))	≥50 psig	Note 3
1	Trip System Logic	--	Note 3
1 (Notes 11,12)	Time Delay (13A-K7) (13A-K31)	3≤ t ≤7 seconds	Note 3

TABLE 3.2.2 NOTES (Cont'd)

13. Whenever the High Pressure Cooling Injection System and Reactor Core Isolation Cooling System are required to be operable in accordance with Specification 3.5, the low steam supply pressure automatic isolation trip system shall be operable, except as provided below:

    A. With the automatic isolation trip function not maintained, restore isolation capability in 1 hour or take the ACTION required by Table 3.2.2.

    B. With one or more required channels inoperable, place the inoperable channel(s) in the tripped condition within 24 hours or take the ACTION required by Table 3.2.2.

BASES: 3.2 (Cont'd)

control and/or bypass valves to open, resulting in a rapid depressurization and cooldown of the reactor vessel. The 800 psig trip setpoint limits the depressurization such that no excessive vessel thermal stress occurs as a result of a pressure regulator malfunction. This setpoint was selected far enough below normal main steam line pressures to avoid spurious primary containment isolations.

Low condenser vacuum has been added as a trip of the Group 1 isolation valves to prevent release of radioactive gases from the primary coolant through condenser. The setpoint of 12 inches of mercury absolute was selected to provide sufficient margin to assure retention capability in the condenser when gas flow is stopped and sufficient margin below normal operating values.

The HPCI and/or RCIC high flow and temperature instrumentation is provided to detect a break in the HPCI and/or RCIC piping. The HPCI and RCIC steam supply pressure instrumentation is provided to isolate the systems when pressure may be too low to continue operation. These isolations are for equipment protection. However, they also provide a diverse signal to indicate a possible system break. These instruments are included in Technical Specifications because of the potential for possible system initiation failure if not properly tested. Tripping of this instrumentation results in actuation of HPCI and/or RCIC isolation valves, i.e., Group 6 valves. A time delay has been incorporated into the RCIC steam flow trip logic to prevent the system from inadvertently isolating due to pressure spikes which may occur on startup. The trip settings are such that core uncovering is prevented and fission product release is within limits.

The instrumentation which initiates ECCS action is arranged in a dual channel system. Permanently installed circuits and equipment may be used to trip instrument channels. In the nonfail safe systems which require energizing the circuitry, tripping an instrument channel may take the form of providing the required relay function by use of permanently installed circuits. This is accomplished in some cases by closing logic circuits with the aid of the permanently installed test jacks or other circuitry which would be installed for this purpose.

The trip logic for the nuclear instrumentation control rod block logic is 1 out of n; i.e., any trip on one of the six APRMs, six IRMs or four SRMs will result in a rod block. The minimum instrument channel requirements for the IRMs may be reduced by one for a short period of time to allow for maintenance, testing or calibration. The RBM is credited in the Continuous Rod Withdrawal During Power Range Operation transient for preventing excessive control rod withdrawal before the fuel cladding integrity safety limit (MCPR) or the fuel rod mechanical overpower limits are exceeded. The RBM upper limit is clamped to provide protection at greater than 100% rated core flow. The clamped value is cycle specific; therefore, it is located in the Core Operating Limits Report.

For single recirculation loop operation, the RBM trip setting is reduced in accordance with the analysis presented in NEDO-30060, February 1983. This adjustment accounts for the difference between the single loop and two loop drive flow at the same core flow, and ensures that the margin of safety is not reduced during single loop operation.

The purpose of the APRM rod block function is to avoid conditions that would require Reactor Protection System action if allowed to proceed. The APRM upscale rod block alarm setting is selected to initiate a rod block before the APRM high neutron flux scram setting is reached. The APRM upscale rod block trip setpoint is varied as a function of reactor recirculation flow. The slope of the rod block trip response curve with recirculation flow is adjustable to allow tracking of the required trip setpoint with