Entergy

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May 21, 2003
BVY 03-49

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. 260**
**Intermediate Range Monitor Surveillance Test Frequencies**

Pursuant to 10CFR50.90, Vermont Yankee[1] (VY) hereby proposes to amend its Facility Operating License, DPR-28, by incorporating the attached proposed changes into the VY Technical Specifications (TS). The proposed changes revise the functional test frequency for the Intermediate Range Monitor (IRM) – High Flux and IRM – Inoperative functions of the Reactor Protection System (RPS). The functional test frequency for the IRM RPS functions is proposed to be extended to once every 31 days. To support this change, an instrument check and a calibration requirement are proposed to be added for the IRM – High Flux function. The subject changes were developed using the guidance of NRC Generic Letter 91-04[2]. Although these proposed changes do not involve a fuel cycle change, the methods for extending surveillance intervals for instrumentation testing are generically applicable.

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 pages. Attachment 4 is the retyped Technical Specification pages.

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

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

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[1] Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. are the licensees of the Vermont Yankee Nuclear Power Station

[2] U.S. Nuclear Regulatory Commission Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24 Month Fuel Cycle," April 2, 1991

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VY requests that a license amendment be issued prior to the next scheduled refueling outage (currently scheduled to commence April 3, 2004), for implementation within 60 days of its effective date. Issuance of a license amendment by this date will enable VY to avoid unnecessary refueling outage surveillance testing.

If you have any questions on this transmittal, please contact Mr. Len Gucwa at (802) 258-4225.

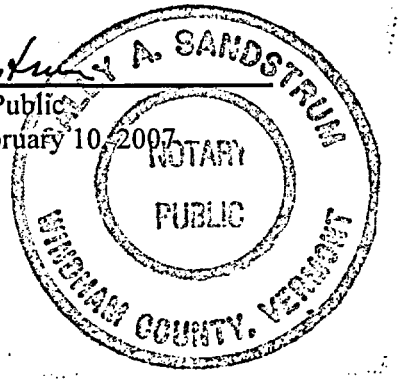
Sincerely,

Jay K. Thayer
Site Vice President

STATE OF VERMONT )
)ss
WINDHAM COUNTY )

Then personally appeared before me, Jay K. Thayer, who, being duly sworn, did state that he is Site Vice President of the Vermont Yankee Nuclear Power Station, that he is duly authorized to execute and file the foregoing document, 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, 2007




Attachments

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

Docket No. 50-271
BVY 03-49

Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 260

Intermediate Range Monitor Surveillance Test Frequencies

Supporting Information and Safety Assessment of Proposed Change

## INTRODUCTION

Purpose

This Proposed Change revises the functional test frequency for the Intermediate Range Monitor (IRM) – High Flux and IRM – Inoperative functions of the Reactor Protection System (RPS) and provides instrument check and calibration requirements for the IRM – High Flux function of the RPS. The functional test frequency for the IRM RPS functions is proposed to be extended from "Before Each Startup & Weekly During Refueling" to "Before and During Each Startup & Once Every 31 days During Refueling." To support the functional test frequency change, an instrument check and a calibration requirement are proposed to be added for the IRM – High Flux function. Current practice is to perform the IRM – High Flux functional test and calibration weekly during refueling and startup.

The subject changes were developed using the guidance of NRC Generic Letter 91-04[1]. Although these proposed changes do not involve a fuel cycle change, the methods for extending surveillance intervals for instrumentation testing are generically applicable.

The following Table 1 provides a detailed discussion of the specific changes, including the bases for the changes and associated safety assessments.

## BACKGROUND

In 1988, General Electric (GE) performed a detailed analysis[2] to confirm acceptability of the then current allowed outage time (AOTs)/surveillance test intervals (STIs) for boiling water reactor (BWR) RPS. This analysis led to changing the frequency for several surveillance tests from monthly to quarterly and in extending the AOTs for many components and functions. An important finding from this analysis was that for each of the RPS initiating events, the RPS unavailability was determined to be insensitive to changes in component failure rates. A factor of 10 increase in the failure rates produced a negligible (0.1%) impact on RPS unavailability for each of the initiating events analyzed. The resultant impact on RPS failure frequency was also found to be negligible.

Additionally, several different sensitivity studies evaluated the impact of methods for performing surveillances and the effects of operator errors. It was also found that reduced redundancy (i.e., unavailability of any one sensor channel) during testing has negligible impact on RPS unavailability.

The RPS IRM functions were not explicitly modeled in NEDC 30851P-A because the events for which these functions provide protection are so mild that safety limits are not violated. As such, the RPS IRM functions have low impact on core melt frequency. Consequently, NEDC 30851P-A did not propose changes to the existing functional test frequency of the RPS IRM functions. The results of the AOT/STI evaluation from NEDC 30851P-A were incorporated into the VY Technical Specifications (TS) by License Amendment No. 186, dated April 3, 2000[3].

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1 U.S. Nuclear Regulatory Commission, Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24 Month Fuel Cycle," April 2, 1991

2 GE Nuclear Energy, NEDC 30851P-A, "Technical Specification Improvement Analysis for BWR Reactor Protection System," March 1988

3 U.S. Nuclear Regulatory Commission letter to Vermont Yankee Nuclear Power Corporation, "Vermont Yankee Nuclear Power Station – Issuance of Amendment Re: Surveillance Test Interval and Allowable Out-of-Service Time (TAC No. MA5876), April 3, 2000

Historical surveillance test data and associated maintenance records were reviewed in evaluating the effect of the proposed change on safety. A review of the IRM functional/calibration tests performed since August 1993 shows a very low frequency of failure which could affect the safety function. In addition, the analytical basis of each IRM trip function was reviewed for each revision to ensure the safety analysis and setpoints were not invalidated. Based upon the results of these reviews, it is concluded that there is no adverse effect on plant safety due to the proposed changes in surveillance testing of IRM trip functions.

NRC Generic Letter 91-04

The proposed RPS IRM surveillance test interval extensions were evaluated with the guidance provided in NRC Generic Letter 91-04. While this proposed TS change is not in support of a fuel cycle change, NRC Generic Letter 91-04 is viewed as generic guidance for addressing the effects of increased surveillance intervals on instrument drift and safety analysis assumptions. Previous discussions with NRC Staff indicate this methodology is an acceptable approach for evaluation of a change to surveillance intervals. The following discussion defines each step outlined in NRC Generic Letter 91-04 and describes the methodology used by the VY staff to evaluate the TS surveillance frequencies proposed to be extended. This methodology is similar to the methodology used to justify extensions to a 24-month fuel cycle at the Perry Nuclear Power Plant[4].

IRM Surveillance Frequency Changes

NRC Generic Letter 91-04 identifies 7 steps for the evaluation of extensions to instrumentation surveillance frequencies.

*STEP 1:*

*Confirm that instrument drift as determined by as-found and as-left calibration data from surveillance and maintenance records has not, except on rare occasions, exceeded acceptable limits for a calibration interval.*

VY Evaluation

The effect of longer calibration intervals on the RPS IRM instrumentation was evaluated by reviewing the surveillance test history for the affected VY instrumentation, including an instrument drift study. The failure history evaluation and drift study demonstrate that, except on rare occasions, instrument drift has not exceeded the allowable limits.

*STEP 2:*

*Confirm that the values of drift for each instrument type (make, model, and range) and application have been determined with a high probability and a high degree of confidence. Provide a summary of the methodology and assumptions used to determine the rate of instrument drift with time based upon historical plant calibration data.*

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[4] U.S. Nuclear Regulatory Commission letter to FirstEnergy Nuclear Operating Company, "Perry Nuclear Power Plant, Unit 1 – Issuance of Amendment Re: Revisions of Various Surveillance Requirements to Support a 24-Month Operating Cycle (TAC No. MA5930)," August 29, 2000

VY Evaluation

VY has performed drift evaluations based upon a VY-specific drift analysis design guide using Microsoft Excel spreadsheets based upon EPRI TR-103335[5]. Other similar spreadsheets were used to independently verify the analysis. The drift analysis utilized the as-found/as-left (AFAL) analysis methodology to statistically determine drift for current calibration intervals. Therefore, in accordance with the methodology of TR-103335 as implemented in VY's drift analysis design guide, the IRM drift analysis determined (based on AFAL data and the time intervals between adjustments) an acceptable calibration interval.

The AFAL methodology utilizes historical data obtained from surveillance tests. The raw calibration data are conditioned prior to use for the drift calculation. The conditioning consists of eliminating tests or individual data points that do not reflect actual drift. The removed data are generally limited to data associated or affected by any of the following:

- Instrument failures
- Procedural problems that affect the calibration data
- Measuring and test equipment problems that affect the calibration data
- Human performance problems that affect the calibration data

In the case of the IRMs, the excluded data were limited to obvious equipment replacement activities, illegible data, and multiple tests performed on the same day.

After the calibration data were properly conditioned, spreadsheets were used to calculate the difference between the current as-found value and the previous as-left value. This difference is the drift and can be expressed in units, percent of span, or percent of setting.

For each calibration point, the spreadsheet is used to determine the following:

- Tolerance interval (95%/95% for this analysis)
- Standard deviation
- Arithmetic mean

The spreadsheets were also used to perform other statistical analyses to identify outliers and determine normality of the data. Additional analyses were performed to verify that appropriate groupings were used and to determine if specific indications of a time drift magnitude correlation exists. The IRM drift values were determined to be time independent over the analyzed time periods, from one month to 30 months. Therefore, the analyzed drift value was determined based on the statistical results for the entire set of drift data.

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5 Electric Power Research Institute, EPRI TR-103335, "Guidelines for Instrument Calibration Extension/Reduction Programs," Revision 1, October 1998

*STEP 3:*

*Confirm that the magnitude of instrument drift has been determined with a high probability and a high degree of confidence for a bounding calibration interval of 30 months for each instrument type (make, model number, and range) and application that performs a safety function. Provide a list of the channels by TS section that identifies these instrument applications.*

NOTE: The IRM functional test surveillance intervals addressed by this document are extended to 31 days, and the calibration surveillance interval is established as once per operating cycle. The drift analysis was performed to obtain a bounding value at an assumed calibration interval of 30 months.

VY Evaluation

In accordance with the methodology described in the previous section, the magnitude of instrument drift was determined with a high degree of confidence and a high degree of probability for a bounding calibration interval (i.e., 30 months) for each affected instrument make and model number and range. The associated IRM instruments for each affected TS surveillance requirement are identified in Table 1 below.

*STEP 4:*

*Confirm that a comparison of the projected instrument drift errors has been made with the values of drift used in the setpoint analysis. If this results in revised setpoints to accommodate larger drift errors, provide proposed TS changes to update trip setpoints. If the drift errors result in revised safety analysis to support existing setpoints, provide a summary of the updated analysis conclusions to confirm that safety limits and safety analysis assumptions are not exceeded.*

VY Evaluation

VY uses a plant-specific design guide for the determination of TS trip settings. The VY methodology is based on ANSI/ISA S67.04[6]. The IRM high flux setpoint calculation has been reviewed to confirm acceptance of a 30 month drift, which encompasses current 18-month operating cycles, and to verify that the existing instrumentation trip setting and TS trip setting values remain valid. In all cases, the plant instrumentation trip setting is more conservative than the calculated trip setpoint; and therefore, the plant instrumentation setting was not changed. In addition, the TS trip setting values remain valid.

The review of the IRM setpoint calculation shows that it is not necessary to revise the TS trip setting for the IRM instrumentation due to the drift evaluation. In addition, the calculation shows that it is not necessary to change the existing analytical limit or safety analysis to accommodate a larger instrument drift error.

[6] Instrument Society of America, ISA S67.04, "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants," Part 1, 1994

*STEP 5:*

*Confirm that the projected instrument errors caused by drift are acceptable for control of plant parameters to effect a safe shutdown with the associated instrumentation.*

VY Evaluation

As discussed in the previous sections, the calculated drift allowances are incorporated in the setpoint calculation, along with other instrument uncertainty. As calculated, the projected instrument errors caused by drift are acceptable over the proposed calibration interval to preserve the safety analysis limit and affect a safe plant shutdown.

It was not necessary to change the existing safe shutdown analysis to account for failures or drift.

*STEP 6:*

*Confirm that all conditions and assumptions of the setpoint and safety analyses have been checked and are appropriately reflected in the acceptance criteria of plant surveillance procedures for channel checks, channel functional tests, and channel calibrations.*

VY Evaluation

In this case, the extrapolated drift was less than the value assumed in the VY calculation. Therefore, there was no change to plant surveillance procedures. The existing drift value used in the IRM setpoint calculation bounds the drift expected for the 30-month interval.

Because the existing plant setting is conservative relative to the calculated setpoint, no changes will be made to the plant surveillance procedures. The assumptions in the safety and setpoint analysis were properly reflected in the acceptance criteria for plant surveillance procedures prior to the evaluation of this change in IRM surveillance frequencies.

*STEP 7:*

*Provide a summary description of the program for monitoring and assessing the effects of increased calibration surveillance intervals on instrument drift and its effect on safety.*

VY Evaluation

Instrument setpoint drift is monitored during channel calibration tests when setpoints are required to be verified and/or set. The IRM instruments with functional test and calibration surveillance frequencies, as described herein, are recorded and assessed in accordance with plant procedures to ensure proper review and evaluation of test results. As-found and as-left calibration data are recorded for each IRM calibration activity. Data sheets are reviewed for completeness and the identification of all AFAL data out-of-specification. Out-of-specification data are retained in an instrument calibration history and are reviewed by the appropriate engineer or analyst for disposition of identified discrepancies, the acceptance of AFAL data, and evidence of negative trends. These actions identify occurrences of instruments found outside of their specified trip setting for proper evaluation and corrective actions.

When as-found (AF) conditions are outside the TS trip setting, an evaluation is performed to evaluate the effect on plant safety, and to evaluate instrument operability. One element of this evaluation may include review of assumptions made to establish the calibration frequency and the acceptability of the current surveillance frequency.

The evaluation of calibration AFAL data results in timely evaluation of the impact of the instrument's performance. These actions effectively identify failures and potential failures of the instrumentation, and any needed corrective actions.

VY Design Considerations

RPS IRM – High Flux Function

The RPS IRMs monitor neutron flux levels from the upper range of the source range monitor (SRM) to the lower range of the average power range monitors (APRMs). The IRMs are capable of generating RPS trip signals that can be used to prevent fuel damage resulting from abnormal operating transients in the intermediate power range. In this power range, the most significant source of reactivity change is due to control rod withdrawal. The IRM provides a diverse protection function from the rod worth minimizer (RWM), which monitors and controls the movement of control rods at low power. The RWM prevents the withdrawal of an out of sequence control rod during startup that could result in an unacceptable neutron flux excursion. The IRM provides mitigation of the neutron flux excursion. To demonstrate the capability of the IRM system to mitigate control rod withdrawal events, generic analysis has been performed to evaluate the consequences of control rod withdrawal events during startup that are mitigated only by the IRM. This analysis demonstrates that the IRM – High Flux function of the RPS provides protection against local control rod withdrawal errors and results in peak fuel enthalpy below the 170 cal/gm fuel failure threshold criterion. During the refuel mode, the IRM – High Flux function provides monitoring for and protection against unexpected reactivity excursions. The IRMs are divided into two groups of IRM channels, with three IRM channels inputting to each trip system. One channel in each trip system may be bypassed without generating a trip. Therefore, four channels of the IRM— High Flux function, with two channels in each trip system, are required to be operable to ensure that no single instrument failure will preclude a scram from this function on a valid signal.

RPS IRM – Inoperative Function

The IRM – Inoperative function provides assurance that a minimum number of IRMs are operable. Anytime an IRM mode switch is moved to any position other than "Operate," the detector voltage drops below a preset level, or when a module is not plugged in, an inoperative trip signal will be received by the RPS unless the IRM channel is bypassed. This function provides overall redundancy and diversity of the RPS. Since only one IRM channel in each trip system may be bypassed, only one IRM in each RPS trip system may be inoperable without resulting in an RPS trip signal. Therefore, four channels of the IRM—Inoperative function, with two channels in each trip system, are required to be operable to ensure that no single instrument failure will preclude a scram from this function on a valid signal.

UFSAR

The following VY UFSAR sections provide additional background information.

- 7.5.5 – Intermediate Range Monitor Subsystem
- 14.5.3.2 – Continuous Rod Withdrawal During Reactor Startup

Comparison to Standard Technical Specifications

Standard Technical Specifications (STS) contain surveillance requirements for the RPS IRM functions in STS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation." In the STS, a channel check requirement is provided for the IRM – Neutron Flux High function with a frequency of 12 hours, a channel functional test requirement is provided for the IRM – Neutron Flux High and the IRM – Inop functions with a frequency of 7 days, and a channel calibration requirement is provided for the IRM – Neutron Flux High function with a frequency of [18] months. (As described in the associated STS Bases, the [18] month Frequency is to be based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.)

The changes proposed in this revision of VY TS are consistent with STS requirements for channel calibration (with the frequency specified consistent with the associated STS Bases) for the RPS IRM – High Flux function. The proposed change involving the instrument check of the RPS IRM – High Flux function is consistent with the STS channel check requirement, except that the frequency of the instrument check is proposed to be daily (consistent with the current frequency for the instrument check of other RPS trip functions) instead of the STS frequency of 12 hours. The proposed change involving the functional test frequency for the RPS IRM functions is not consistent with the STS frequency for the channel functional test. However, the proposed functional test frequency for these functions has been shown to be acceptable based on a plant-specific basis evaluation of the VY instrumentation using the guidance in NRC Generic Letter 91-04.

Precedent

On August 29, 2000, NRC granted a license amendment for FirstEnergy's Perry nuclear plant, which broadly extended surveillance intervals to support a 24-month fuel cycle following the guidance of Generic Letter 91-04. Although the VY proposed changes do not involve a fuel cycle change, the methods similar to those used for extending surveillance intervals for instrumentation were used to support these changes. In addition, the concepts for extending surveillance test intervals (STIs) are consistent with the bases for changes to reactor protection system STIs granted in VY license amendment 186.

## SAFETY ASSESSMENT

Table 1 (below) provides a detailed description of each change, including the basis for the change and a safety assessment. The Change Numbers in the left-hand column correspond to the boxed annotation numbers in Attachment 3, "Marked-Up Version of the Current Technical Specifications." Attachment 4, "Retyped Technical Specification Pages," illustrates the proposed changes in final form.

**Table 1**

| Change # | Current Technical Specification | Proposed Change |
|---|---|---|
| 1 | Current Technical Specification (CTS) Table 4.1.1 provides functional test requirements for the Reactor Protection System (RPS) functions.<br><br>The functional test frequency specified for each of the RPS Intermediate Range Monitor (IRM) functions is as follows:<br><br>*Before Each Startup & Weekly During Each Refueling*[6].<br><br>Note 6 to Table 4.1.1 states:<br><br>*6. Frequency need not exceed weekly.* | The surveillance test interval for the functional test, as applied to these functions, is being increased from weekly to once every 31 days, for a maximum interval of 39 days, including the 25% grace period allowed by CTS definition 1.0.Y, "Surveillance Frequency." The word "During" is provided, to the minimum frequency requirement and is applicable during startup as an additional restriction to ensure that the surveillance is maintained current when the unit is in startup.<br><br>For the RPS IRM functions, the minimum frequency specified in Table 4.1.1 is changed to:<br><br>*Before and During Each Startup & Once Every 31 Days During Refueling*[11][12] .<br><br>New Note 11 is added to Table 4.1.1 and states:<br><br>*11. Not required to be performed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.*<br><br>New Note 12 is added to Table 4.1.1 and states:<br><br>*12. Frequency need not exceed once every 31 days.* |

**Table 1**
(continued)

| Change # | Basis / Safety Assessment |
|---|---|
| 1 | The IRM functional surveillance requirement was evaluated relative to extending the test interval. This surveillance requirement ensures that the RPS IRMs will function as designed when required. Potential time-based considerations, such as instrument drift, failure types and frequencies, as well as other qualitative measures of system availability, were evaluated during this effort. The evaluation results and an explanation of how the results justify the surveillance interval extension, are discussed below.<br><br>The surveillance test interval for the IRM functional tests is being increased from weekly to once every 31 days, for a maximum interval of 39 days, including the 25% grace period. The calibration interval for the RPS IRM – High Flux function, currently performed weekly during refueling in conjunction with the functional test, is also being modified as a result of the change to the functional test interval. An explicit calibration requirement will be provided in the TS with a surveillance test interval of once per operating cycle (see Change #3 below).<br><br>An evaluation of the surveillance interval extension was performed, based upon the approach described in NRC Generic Letter 91-04. Functional testing is performed for each channel of the IRM – High Flux and IRM – Inoperative functions, except for the sensors, to ensure performance of the intended functions. Furthermore, the RPS IRM – High Flux instrumentation has been evaluated based on make, manufacturer and model number to determine that the instrumentation's actual drift falls within the assumed drift in the associated setpoint calculation.<br><br>Neutron monitors and trip units provided by General Electric perform the RPS IRM function. A drift calculation was performed for these General Electric neutron monitors and trip units. The IRMs are only required when the plant is in startup or during refueling. During power operation in the run mode, the IRM trip is inactive. When the IRM detectors are used for operation, an overlap check is performed to determine if the instruments are reading and tracking with the power range or the source range neutron detectors, as applicable.<br><br>The design for the RPS IRM functions (four required channels, with two required channels per trip system, for each function) ensures no single failure or out-of-tolerance condition for a channel can prevent the proper operation of the protective function. For the IRM – High Flux function, an instrument check will be added to Table 4.1.1 Note 2 to confirm proper operation of channel instrumentation once per day when the instrumentation is required to be operable (see Change #2 below). This check verifies agreement among the different channels of indication and confirms operation of channel components. Also, when operable, Operations personnel continually monitor the indications from these instrument channels. Therefore, operators will detect failures in the channel components through significant changes in indication or deviations among channels. |

**Table 1**
(continued)

| Change # | Basis / Safety Assessment |
|---|---|
| 1 | (continued)<br><br>A review of the surveillance test history and a drift analysis provides a high degree of confidence that the channels will operate reliably for the extended surveillance interval. Based upon:<br>1. the high degree of reliability of the four required channel system design of each of the IRM functions;<br>2. the failure-detection capability due to the required instrument check and continual monitoring of the instrumentation; and<br>3. establishment of instrument setpoints, for the IRM – High Flux function, based upon drift analysis for the extended surveillance interval.<br><br>The effect, if any, of this proposed change on system availability is minimal.<br><br>A review of the surveillance test history was performed, and out of 333 IRM functional/calibration tests performed during the review period since August, 1993, only one failure was observed which affected the safety function. On September 25, 1993, the as-found value of the IRM E voltage pre-regulator was found outside of tolerance. The voltage pre-regulator was unable to be adjusted. The test was suspended and the remaining portion of the functional/calibration test of IRM E was not completed. As a result, the impact of this out-of-tolerance on the ability of the IRM E to perform its safety function could not be determined. Therefore, this failure is being considered to have adversely impacted the safety function. The cause of this out-of-tolerance was determined to be a degraded voltage pre-amplifier board. The voltage pre-amplifier board was replaced and the functional/calibration test of IRM E successfully completed on September 26, 1993. No other out-of-tolerance conditions associated with the IRM voltage pre-regulators was observed in the surveillance test history review. Therefore, this failure is considered unique, with no time-based failure mechanism. Therefore, extension of the surveillance interval for these tests will have no effect on system availability with respect to failures of this type.<br><br>Based on the above discussion, the review of the surveillance test history demonstrates that only one unique failure affected the safety function during the surveillance activity, and no identified failure invalidates the conclusion that the effect, if any, of this proposed change on system availability is minimal. |

**Table 1**
(continued)

| Change # | Basis / Safety Assessment |
|---|---|
| 1 | (continued)<br><br>New Note 11 to Table 4.1.1 allows the functional testing of the IRM instrument channels to be performed within 12 hours of entering the STARTUP/HOT STANDBY MODE from the RUN MODE. Testing of these instrument channels cannot be performed in the RUN MODE without utilizing jumpers, lifted leads, or movable links. Use of these devices is not recommended since errors in their use may significantly increase the probability of a reactor transient or event, which is a precursor to a previously analyzed accident. Note 11 allows entry into the STARTUP/HOT STANDBY MODE (where the IRM instrumentation is required to be operable) from the RUN MODE if the associated functional test frequency has not been met. The 12 hour time period is considered acceptable (because of the restrictions to testing in the RUN Mode) based on operating experience and in consideration of providing a reasonable time in which to complete the surveillance requirement. The provisions of Note 11 are consistent with the STS.<br><br>New Note 12 to Table 4.1.1 clarifies the 31 day surveillance frequency requirement. The Note allows credit for performing testing within 31 days prior to entering the STARTUP/HOT STANDBY MODE at the end of a refueling outage and the surveillance does not need to be performed again provided the 31 day frequency is not exceeded prior to entering the RUN MODE at the end of the refueling outage. Similarly, if the surveillance is performed while in the STARTUP/HOT STANDBY MODE prior to refueling, the surveillance need not be performed again provided the surveillance interval is not exceeded. This provision is acceptable because it enforces the required periodic surveillance which demonstrates instrument operability without imposing unnecessary additional testing during the 31 day surveillance interval. |

**Table 1**
(continued)

| Change # | Current Technical Specification | Proposed Change |
|---|---|---|
| 2 | CTS Table 4.1.1 provides instrument check requirements for selected RPS functions, but not IRM instrumentation.<br><br>Current Note 2 states:<br><br>*2. An instrument check shall be performed on reactor water level and reactor pressure instrumentation once per day.* | A requirement is added to perform a daily instrument check of the RPS IRM – High Flux function when the IRM – High Flux trip function is required to be operable.<br><br>The IRM High Flux function of CTS Table 4.1.1 is annotated as follows:<br><br>*IRM*<br>*High Flux*[10].<br><br>Note 10 to CTS Table 4.1.1 is added to state:<br><br>*10. When the IRM – High Flux trip function is required to be operable, an instrument check shall be performed on IRM instrumentation once per day.* |
| | **Basis / Safety Assessment:**<br><br>Providing an explicit instrument check requirement for the RPS IRM – High Flux function represents an additional restriction on plant operation necessary to support the extension of the functional test frequency addressed in Proposed Change #1 above. The instrument check confirms proper operation of channel instrumentation once per day by verifying agreement among the different channels of indication and confirming operation of channel components. The proposed frequency for the Instrument Check of the RPS IRM – High Flux function is consistent with the instrument checks performed for other RPS trip functions listed in Table 4.1.1. This more restrictive change is considered an enhancement to plant safety and is therefore acceptable. | |

**Table 1**
(continued)

| Change # | Current Technical Specification | Proposed Change |
|---|---|---|
| 3 | CTS Table 4.1.2 provides calibration requirements for selected RPS functions. Currently, Table 4.1.2 does not include explicit calibration requirements for the RPS IRM – High Flux function. | CTS Table 4.1.2 and the associated Notes to Table 4.1.2 are revised to include calibration requirements for the RPS IRM – High Flux function.<br><br>CTS Table 4.1.2 is revised to include the following as the first line:<br><br>In the Instrument Channel column;<br><br>*High Flux IRM*<br>*Output Signal (7) (9) (10)*<br><br>In the Group (1) column;<br><br>*C*<br><br>In the Calibration Standard (4) column;<br><br>*Standard Voltage Source*<br><br>In the Minimum Frequency (2) column;<br><br>*Once/Operating Cycle*<br><br>CTS Table 4.1.2 Notes are revised to include new Notes 9 and 10:<br><br>*9. Neutron detectors are excluded.*<br><br>*10. Not required to be performed when entering STARTUP/HOT STANDBY MODE from RUN mode until 12 hours after entering STARTUP/HOT STANDBY MODE.* |

**Table 1**
(continued)

| Change # | Basis / Safety Assessment |
|---|---|
| 3 | The IRM – High Flux calibration is a complete check of the instrument loop (except sensors) and verifies that each channel responds with the necessary range and accuracy. Providing an explicit calibration requirement for the RPS IRM – High Flux function represents an additional restriction on plant operation necessary to ensure the RPS IRM – High Flux function is maintained capable of performing its required function. The addition of an explicit RPS IRM – High Flux function calibration requirement is consistent with the STS.<br><br>As a conforming change, CTS Table 4.1.2 Note 7 is applied to the added RPS IRM – High Flux function calibration requirement for consistency and completeness since Note 7 currently includes requirements to verify overlap between SRM and IRM channels, and between IRM and APRM channels.<br><br>With the addition of the RPS IRM – High Flux calibration requirement, new Notes 9 and 10 are provided. Note 9 to CTS Table 4.1.2 excludes neutron detectors from calibration of the RPS IRM – High Flux function. This is acceptable because the neutron detectors of the RPS IRM – High Flux function are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Excluding the neutron detectors from the calibration of the RPS IRM – High Flux function is consistent with current industry and operating practice and is consistent with the STS. New Note 10 to CTS Table 4.1.2 allows the calibration of the RPS IRM – High Flux function to be performed within 12 hours of entering the STARTUP/HOT STANDBY MODE from the RUN MODE. Testing of the RPS IRM – High Flux functions cannot be performed in the RUN MODE without utilizing jumpers, lifted leads, or movable links. Use of these devices is not recommended since errors in their use may significantly increase the probability of a reactor transient or event, which is a precursor to a previously analyzed accident. Note 10 allows entry into the STARTUP/HOT STANDBY MODE (where the RPS IRM – High Flux function is required to be operable) from the RUN MODE if the associated calibration frequency has not been met. The 12 hour time period is considered to provide a reasonable time in which to complete the calibration. The provisions of Note 10 are consistent with the STS.<br><br>As a conforming change, the Group of the RPS IRM – High Flux function sensors is specified in CTS Table 4.1.2. Specifying the associated Group as "C" is consistent with the plant design of these RPS functions and the CTS Bases 4.1 which states, "Group C devices are active only during a given portion of the operating cycle. For example, the IRM is active during start-up and inactive during full power operation." As an additional conforming change, the detail regarding the performance of the calibration, i.e., using a standard voltage source, is specified consistent with current plant practice. |

**Table 1**
(continued)

| Change # | Basis / Safety Assessment | |
|---|---|---|
| 3 | (continued)<br><br>The proposed Once/Operating Cycle frequency for the calibration is based on a 30 month calibration interval (which encompasses the current, nominal 18-month cycles) in the determination of the magnitude of equipment drift in the setpoint analysis. The acceptability the Once/Operating Cycle proposed frequency for the calibration of the RPS IRM – High Flux function is also addressed in Proposed Change #1 above and the "Background" discussion provided as part of this request for a license amendment.<br><br>This more restrictive change, i.e., addition of the RPS IRM – High Flux calibration requirement, is considered an enhancement to plant safety and is acceptable because it is based on an analysis of acceptable instrument behavior, including provision for a 30-month period of instrument drift. | |
| **Change #** | **Current Technical Specification** | **Proposed Change** |
| 4 | Bases are provided for TS Section 3/4.1. | Conforming changes to the Bases for TS Section 3/4.1 are being made to clarify the associated Specifications. |
| | **Basis / Safety Assessment:**<br><br>Bases changes are made for clarity purposes and conformance to the changes being made to the associated Specifications. Bases do not establish actual requirements, and as such do not change technical requirements of the TS. Therefore, the changes are administrative in nature and have no negative impact on plant safety. | |

Conclusion/Summary

VY concludes that this proposed change does not adversely affect plant safety and will result in a net benefit to safe operation of the facility, and is therefore acceptable. Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the requested license amendment will not be inimical to the common defense and security or to the health and safety of the public.

Docket No. 50-271
BVY 03-49

Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 260

Intermediate Range Monitor Surveillance Test Frequencies

Determination of No Significant Hazards Consideration

## DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Description of amendment request:

The license amendment request will extend the functional test frequency, for the Reactor Protection System (RPS) Intermediate Range Monitor (IRM) functions in Technical Specification Table 4.1.1. To support this change, an instrument check and a calibration requirement are to be added to the Technical Specifications for the RPS IRM – High Flux function. Conforming Technical Specifications Bases changes are also being made.

Each of the proposed changes can be categorized as one of the following:

1. Extension of functional test frequency of the RPS IRM functions from weekly to 31 days;
2. An imposition of more restrictive requirements (addition of explicit instrument check and calibration requirements for the RPS IRM – High Flux function) to ensure equipment operability that is driven by an effort for completeness and consistency with the BWR/4 Standard Technical Specifications; or
3. Administrative changes which add clarity.

Basis for no significant hazards determination:

Pursuant to 10CFR50.92, 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). These criteria require that the operation of the facility in accordance with the proposed amendment will not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. The discussion below addresses each of these criteria and demonstrates that the proposed amendment does not constitute a significant hazard.

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 proposed Technical Specifications (TS) change involves an increase in the surveillance testing interval for Reactor Protection System (RPS) Intermediate Range Monitor (IRM) Surveillance Requirements (SRs) from weekly to 31 days. The proposed TS changes do not physically impact the plant, nor do they impact any design or functional requirements of the associated systems. That is, the proposed TS change does not degrade the performance of, or increase the challenges to, any safety systems assumed to function in the safety analysis. The proposed TS changes do not impact the way in which surveillances are performed. In addition, the proposed TS change does not introduce any accident initiators, since no accidents previously evaluated relate to the frequency of surveillance testing. Also, evaluation of the proposed TS change demonstrates that the availability of equipment and systems required to prevent or mitigate the radiological consequences of an accident are not significantly affected because of other, more frequent testing that is performed, the availability of redundant systems and equipment, or the high reliability of the equipment. Since the impact on the systems is minimal, it is concluded that the overall impact on the plant safety analysis is negligible.

Furthermore, an historical review of surveillance test results and associated maintenance records indicates there is no evidence of any failure that would invalidate the above conclusions. More stringent TS requirements that ensure operability of equipment 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 TS change involves an increase in the surveillance testing intervals for RPS IRM SRs from weekly to 31 days. The proposed TS change also provides more stringent requirements to ensure the operability of equipment. The proposed TS change does not introduce any failure mechanisms of a different type than those previously evaluated, since no physical changes to the plant are being made. Also, no new or different equipment is being installed, and no installed equipment is being operated in a different manner. As a result, no new failure modes are introduced. In addition, the ways that surveillance tests are performed remain unchanged.

Furthermore, an historical review of surveillance test results and associated maintenance records indicates there is no evidence of any failure that would invalidate the above conclusions.

Therefore, the proposed TS change does not create the possibility of a new or different kind of accident from any 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.

Although the proposed TS change results in changes to the interval between certain surveillance tests, the impact, if any, on system availability is minimal, based upon other, more frequent testing that is performed, the existence of redundant systems and equipment, or overall system reliability. Evaluations show there is no evidence of time-dependent failures that would impact the availability of the systems. The proposed change does not significantly impact the condition or performance of structures, systems, and components relied upon for accident mitigation.

Furthermore, an historical review of surveillance test results and associated maintenance records indicates there was no evidence of any failure that would invalidate the above conclusions. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

In addition, the imposition of more stringent requirements, to ensure equipment operability, has no negative impact on margins of safety.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

**Summary No Significant Hazards Consideration**

Conclusion

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.

Docket No. 50-271
BVY 03-49

Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 260

Intermediate Range Monitor Surveillance Test Frequencies

Marked-up Version of the Current Technical Specifications

TABLE 4.1.1

SCRAM INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS

MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTRUMENTATION, LOGIC SYSTEMS AND CONTROL CIRCUITS

| Instrument Channel | Group[3] | Functional Test[7] | Minimum Frequency[4] |
|---|---|---|---|
| Mode Switch in Shutdown | A | Place Mode Switch in Shutdown | Each Refueling Outage |
| Manual Scram | A | Trip Channel and Alarm | Every 3 Months |
| IRM | | | |
| High Flux | C | Trip Channel and Alarm[5] | Before Each Startup & Weekly During Refueling[6] |
| Inoperative | C | Trip Channel and Alarm | Before Each Startup & Weekly During Refueling[6] |
| APRM | | | |
| High Flux | B | Trip Output Relays[5] | Every 3 Months |
| High Flux (Reduced) | B | Trip Output Relays[5] | Before Each Startup & Weekly During Refueling[6] |
| Inoperative | B | Trip Output Relays | Every 3 Months |
| Flow Bias | B | Trip Output Relays[5] | Every 3 Months |
| High Reactor Pressure | B | Trip Channel and Alarm[5] | Every 3 |
| High Drywell Pressure | B | Trip Channel and Alarm[5] | Every |
| Low Reactor Water Level[2][8] | B | Trip Channel and Alarm[5] | Every 3 |
| High Water Level in Scram Discharge Volume | B | Trip Channel and Alarm[5] | Every 3 Mon |
| Main Steam Line Iso. Valve Closure | A | Trip Channel and Alarm | Every 3 Months |
| Turbine Con. Valve Fast Closure | A | Trip Channel and Alarm | Every 3 Months |
| Turbine Stop Valve Closure | A | Trip Channel and Alarm | Every 3 Months |
| Scram Test Switch (5A-S2(A-D)) | A | Trip Channel and Alarm | Once each week (9) |
| First Stage Turbine Pressure - Permissive (PS-5-14(A-D)) | A | Trip Channel and Alarm | Every 6 Months |

2

(10)

Before and During Each Startup & Once Every 31 Days During Refueling[11][12]

1

TABLE 4.1.1 NOTES

1. Not used

2. An instrument check shall be performed on reactor water level and reactor pressure instrumentation once per day.

3. A description of the three groups is included in the basis of this Specification.

4. Functional tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

5. This instrumentation is exempted from the Instrument Functional Test Definition (1.G.). This Instrument Functional Test will consist of injecting a simulated electrical signal into the measurement channels.

6. Frequency need not exceed weekly.

7. A functional test of the logic of each channel is performed as indicated. This coupled with placing the mode switch in shutdown each refueling outage constitutes a logic system functional test of the scram system.

8. The water level in the reactor vessel will be perturbed and the corresponding level indicator changes will be monitored. This test will be performed every month.

9. The automatic scram contactors shall be exercised once every week by either using the RPS channel test switches or performing a functional test of any automatic scram function. If the contactors are exercised using a functional test of a scram function, the weekly test using the RPS channel test switch is considered satisfied. The automatic scram contactors shall also be exercised after maintenance on the contactors.

2

10. When the IRM – High Flux trip function is required to be operable, an instrument check shall be performed on IRM instrumentation once per day.

1

11. Not required to be performed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.

12. Frequency need not exceed once every 31 days.

TABLE 4.1.2

SCRAM INSTRUMENT CALIBRATION

MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

| Instrument Channel | Group(1) | Calibration Standard(4) | Minimum Frequency(2) |
|---|---|---|---|
| High Flux APRM | | | |
| Output Signal | B | Heat Balance | Once Every 7 Days |
| Output Signal (Reduced) (7) | B | Heat Balance | Once Every 7 Days |
| Flow Bias | B | Standard Pressure and Voltage Source | Refueling Outage |
| LPRM (LPRM ND-2-1-104(80)) | B(5) | Using TIP System | Every 2,000 MWD/T average core exposure (8) |
| High Reactor Pressure | B | Standard Pressure Source | Once/Operating Cycle |
| Turbine Control Valve Fast Closure | A | Standard Pressure Source | Every 3 Months |
| High Drywell Pressure | B | Standard Pressure Source | Once/Operating Cycle |
| High Water Level in Scram Discharge Volume | B | Water Level | Once/Operating Cycle |
| Low Reactor Water Level | B | Standard Pressure Source | Once/Operating Cycle |
| Turbine Stop Valve Closure | A | (6) | Refueling Outage |
| First Stage Turbine Pressure Permissive (PS-5-14(A-D)) | A | Pressure Source | Every 6 Months and After Refueling |
| Main Steam Line Isolation Valve Closure | A | (6) | Refueling Outage |
| High Flux IRM Output Signal (7)(9)(10) | C | Standard Voltage Source | Once/Operating Cycle |

3

TABLE 4.1.2 NOTES

1. A description of the three groups is included in the bases of this Specification.

2. Calibration tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

3. Deleted.

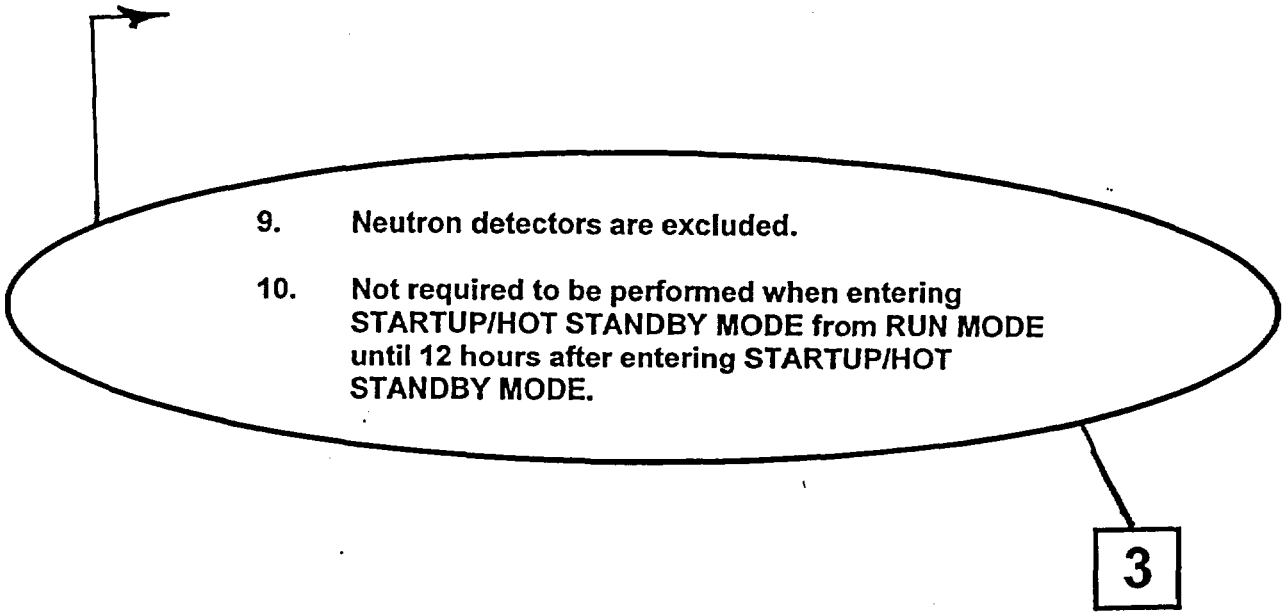
4. Response time is not part of the routine instrument check and calibration, but will be checked every operating cycle.

5. Does not provide scram function.

6. Physical inspection and actuation.

7. The IRM and SRM channels shall be determined to overlap during each startup after entering the STARTUP/HOT STANDBY MODE and the IRM and APRM channels shall be determined to overlap during each controlled shutdown, if not performed within the previous 7 days.

8. The specified frequency is met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance.



BASES: 4.1 (Cont'd)

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 2,000 megawatt-days per short ton (MWD/T) frequency is based on operating experience with LPRM sensitivity changes, and that the resulting nodal power uncertainty, combined with other identified uncertainties, remains less than the total uncertainty (i.e., 8.7%) allowed by the GETAB safety limit analysis.

B. The ratio of MFLPD to FRP shall be checked once per day when operating at ≥25% Rated Thermal Power to determine if the APRM gains require adjustment. Because few control rod movements or power changes occur, checking these parameters daily is adequate. The 12 hour allowance after thermal power ≥25% Rated Thermal Power is achieved is acceptable given the large inherent margin to operating limits at low power levels.

< INSERT #1 >

4

INSERT #1

IRM surveillance requirements are modified by Note 11 to Table 4.1.1 and Note 10 to Table 4.1.2 for functional and calibration testing, respectively. These Notes allow functional testing and calibration of IRM instrument channels to be performed within 12 hours of entering the STARTUP/HOT STANDBY MODE from the RUN MODE. This allowance is necessary since testing of IRM instrument channels cannot be performed in the RUN MODE without utilizing jumpers, lifted leads, or movable links. The 12 hour time period is considered to provide reasonable time to complete testing.

The IRM surveillance requirements for functional testing "Before and During Each Startup & Once Every 31 Days During Refueling" are modified by Note 12 to Table 4.1.1. Note 12 to Table 4.1.1 states the "frequency need not exceed once every 31 days." As a result, within 31 days before entering the STARTUP/HOT STANDBY MODE and once every 31 days while the plant is in the STARTUP/HOT STANDBY MODE or REFUEL MODE, a functional test of the IRM instrument channels must be performed. The IRM instrument channel surveillance requirements may be satisfied with the performance of only one functional test of each of the required instrument channels prior to entering the STARTUP/HOT STANDBY MODE at the end of a refueling outage, provided the 31 day frequency (plus 25% Surveillance Frequency allowance) is not exceeded prior to entering the RUN MODE.

The IRM calibration requirements are modified by Note 9 to Table 4.1.2 to exclude neutron detectors from calibration of the IRM – High Flux instrument channels. This is acceptable because the neutron detectors are passive devices with minimal drift, and because of the difficulty of simulating a meaningful signal.

Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 260

Intermediate Range Monitor Surveillance Test Frequencies

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 included herein. The revised pages contain vertical lines in the margin indicating the areas of change.

| Remove | Insert |
|---|---|
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 33a | 33a |

TABLE 4.1.1

SCRAM INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS
MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTRUMENTATION, LOGIC SYSTEMS AND CONTROL CIRCUITS

| Instrument Channel | Group[3] | Functional Test[7] | Minimum Frequency[4] |
|---|---|---|---|
| Mode Switch in Shutdown | A | Place Mode Switch in Shutdown | Each Refueling Outage |
| Manual Scram | A | Trip Channel and Alarm | Every 3 Months |
| IRM | | | |
| High Flux[10] | C | Trip Channel and Alarm[5] | Before and During Each Startup & Once Every 31 Days During Refueling[11][12] |
| Inoperative | C | Trip Channel and Alarm | Before and During Each Startup & Once Every 31 Days During Refueling[11][12] |
| APRM | | | |
| High Flux | B | Trip Output Relays[5] | Every 3 Months |
| High Flux (Reduced) | B | Trip Output Relays[5] | Before Each Startup & Weekly During Refueling[6] |
| Inoperative | B | Trip Output Relays | Every 3 Months |
| Flow Bias | B | Trip Output Relays[5] | Every 3 Months |
| High Reactor Pressure | B | Trip Channel and Alarm[5] | Every 3 Months |
| High Drywell Pressure | B | Trip Channel and Alarm[5] | Every 3 Months |
| Low Reactor Water Level[2][8] | B | Trip Channel and Alarm[5] | Every 3 Months |
| High Water Level in Scram Discharge Volume | B | Trip Channel and Alarm[5] | Every 3 Months |
| Main Steam Line Iso. Valve Closure | A | Trip Channel and Alarm | Every 3 Months |
| Turbine Con. Valve Fast Closure | A | Trip Channel and Alarm | Every 3 Months |
| Turbine Stop Valve Closure | A | Trip Channel and Alarm | Every 3 Months |
| Scram Test Switch (5A-S2(A-D)) | A | Trip Channel and Alarm | Once each week (9) |
| First Stage Turbine Pressure - Permissive (PS-5-14(A-D)) | A | Trip Channel and Alarm | Every 6 Months |

TABLE 4.1.1 NOTES

1. Not used

2. An instrument check shall be performed on reactor water level and reactor pressure instrumentation once per day.

3. A description of the three groups is included in the basis of this Specification.

4. Functional tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

5. This instrumentation is exempted from the Instrument Functional Test Definition (1.G.). This Instrument Functional Test will consist of injecting a simulated electrical signal into the measurement channels.

6. Frequency need not exceed weekly.

7. A functional test of the logic of each channel is performed as indicated. This coupled with placing the mode switch in shutdown each refueling outage constitutes a logic system functional test of the scram system.

8. The water level in the reactor vessel will be perturbed and the corresponding level indicator changes will be monitored. This test will be performed every month.

9. The automatic scram contactors shall be exercised once every week by either using the RPS channel test switches or performing a functional test of any automatic scram function. If the contactors are exercised using a functional test of a scram function, the weekly test using the RPS channel test switch is considered satisfied. The automatic scram contactors shall also be exercised after maintenance on the contactors.

10. When the IRM-High Flux trip function is required to be operable, an instrument check shall be performed on IRM instrumentation once per day.

11. Not required to be performed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.

12. Frequency need not exceed once every 31 days.

TABLE 4.1.2

SCRAM INSTRUMENT CALIBRATION

MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

| Instrument Channel | Group(1) | Calibration Standard(4) | Minimum Frequency(2) |
|---|---|---|---|
| High Flux IRM Output Signal(7)(9)(10) | C | Standard Voltage Source | Once/Operating Cycle |
| High Flux APRM | | | |
| Output Signal | B | Heat Balance | Once Every 7 Days |
| Output Signal (Reduced) (7) | B | Heat Balance | Once Every 7 Days |
| Flow Bias | B | Standard Pressure and Voltage Source | Refueling Outage |
| LPRM (LPRM ND-2-1-104(80)) | B(5) | Using TIP System | Every 2,000 MWD/T average core exposure (8) |
| High Reactor Pressure | B | Standard Pressure Source | Once/Operating Cycle |
| Turbine Control Valve Fast Closure | A | Standard Pressure Source | Every 3 Months |
| High Drywell Pressure | B | Standard Pressure Source | Once/Operating Cycle |
| High Water Level in Scram Discharge Volume | B | Water Level | Once/Operating Cycle |
| Low Reactor Water Level | B | Standard Pressure Source | Once/Operating Cycle |
| Turbine Stop Valve Closure | A | (6) | Refueling Outage |
| First Stage Turbine Pressure Permissive (PS-5-14(A-D)) | A | Pressure Source | Every 6 Months and After Refueling |
| Main Steam Line Isolation Valve Closure | A | (6) | Refueling Outage |

TABLE 4.1.2 NOTES

1. A description of the three groups is included in the bases of this Specification.

2. Calibration tests are not required when the systems are not required to be operable or are tripped. If tests are missed, they shall be performed prior to returning the systems to an operable status.

3. Deleted.

4. Response time is not part of the routine instrument check and calibration, but will be checked every operating cycle.

5. Does not provide scram function.

6. Physical inspection and actuation.

7. The IRM and SRM channels shall be determined to overlap during each startup after entering the STARTUP/HOT STANDBY MODE and the IRM and APRM channels shall be determined to overlap during each controlled shutdown, if not performed within the previous 7 days.

8. The specified frequency is met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance.

9. Neutron detectors are excluded.

10. Not required to be performed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.

BASES: 4.1 (Cont'd)

IRM surveillance requirements are modified by Note 11 to Table 4.1.1 and Note 10 to Table 4.1.2 for functional and calibration testing, respectively. These Notes allow functional testing and calibration of IRM instrument channels to be performed within 12 hours of entering the STARTUP/HOT STANDBY MODE from the RUN MODE. This allowance is necessary since testing of IRM instrument channels cannot be performed in the RUN MODE without utilizing jumpers, lifted leads, or movable links. The 12 hour time period is considered to provide reasonable time to complete testing.

The IRM surveillance requirements for functional testing "Before and During Each Startup & Once Every 31 Days During Refueling" are modified by Note 12 to Table 4.1.1. Note 12 to Table 4.1.1 states the "frequency need not exceed once every 31 days." As a result, within 31 days before entering the STARTUP/HOT STANDBY MODE and once every 31 days while the plant is in the STARTUP/HOT STANDBY MODE or REFUEL MODE, a functional test of the IRM instrument channels must be performed. The IRM instrument channel surveillance requirements may be satisfied with the performance of only one functional test of each of the required instrument channels prior to entering the STARTUP/HOT STANDBY MODE at the end of a refueling outage, provided the 31 day frequency (plus 25% Surveillance Frequency allowance) is not exceeded prior to entering the RUN MODE.

The IRM calibration requirements are modified by Note 9 to Table 4.1.2 to exclude neutron detectors from calibration of the IRM-High Flux instrument channels. This is acceptable because the neutron detectors are passive devices with minimal drift, and because of the difficulty of simulating a meaningful signal.

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 2,000 megawatt-days per short ton (MWD/T) frequency is based on operating experience with LPRM sensitivity changes, and that the resulting nodal power uncertainty, combined with other identified uncertainties, remains less than the total uncertainty (i.e., 8.7%) allowed by the GETAB safety limit analysis.

B. The ratio of MFLPD to FRP shall be checked once per day when operating at $\geq$25% Rated Thermal Power to determine if the APRM gains require adjustment. Because few control rod movements or power changes occur, checking these parameters daily is adequate. The 12 hour allowance after thermal power $\geq$25% Rated Thermal Power is achieved is acceptable given the large inherent margin to operating limits at low power levels.