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February 12, 2008
BVY 08-001

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Reference:
(1) Letter, Entergy Nuclear Operations, Inc. to USNRC, "Technical Specification Proposed Change No. 259, Instrumentation Technical Specification," BVY 03-040, dated April 17, 2003.
(2) Letter, USNRC to Entergy Nuclear Operations, Inc., "Request for Additional Information – Instrumentation Technical Specifications, Vermont Yankee Nuclear Power Station (TAC NO. MB8714)," NVY 05-008, dated January 12, 2005.
(3) Letter, Entergy Nuclear Operations, Inc. to USNRC, "Response to Request for Additional Information – Instrumentation Technical Specifications, Vermont Yankee Nuclear Power Station (TAC NO. MB8714)," BVY 05-068, dated June 30, 2005.

Subject: **Vermont Yankee Nuclear Power Station**
License No. DPR-28 (Docket No. 50-271)
Technical Specifications Proposed Change No. 273
Instrumentation Technical Specifications

Pursuant to 10 CFR 50.90, Vermont Yankee[1] (VY) hereby proposes to amend its Facility Operating License, DPR-28, by incorporating the attached proposed change into the VY Technical Specifications (TS). The proposed change revises TS Sections 2.1, "Limiting Safety System Setting," 3.1, "Reactor Protection System," 3.2, "Protective Instrument Systems," associated Surveillance Requirements, and other TS with similar requirements as these instrumentation TS sections. The Improved Standard Technical Specifications (ISTS)[2] were used as guidance in developing the proposed change. This proposed change is a resubmittal, with enhancements, of information previously submitted in Reference (1), which was withdrawn on September 7, 2005 after discussions with the NRC staff. The present submittal incorporates changes made in response to Reference (2) that were submitted with Reference (3) shortly before agreement was reached to withdraw Proposed Change No. 259.

The proposed changes include the following:

1. Revisions are made to wording, and human factors principles are applied to the format and presentation of Actions, Notes and Tables. These administrative enhancements (designated herein as Category A) are made to improve usability and clarity for the operators and other users.

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

2 NUREG 1433, Revision 3.0, Standard Technical Specifications, General Electric Plants, BWR/4, dated June 2004

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2. Technical changes are made to resolve non-conservative TS issues (designated herein as Category M) currently being addressed by administrative controls, provide relaxation of overly restrictive requirements (designated herein as Category LA or L) and ensure consistency between TS requirements and the design and licensing basis through implementation of both more and less restrictive requirements.

3. Certain requirements (designated herein as Category R) are relocated to plant controlled documents to allow the change process for these requirements to be enhanced.

4. Enhancements are made to the associated Bases (provided herewith for information only).

As a result, the proposed change will correct deficiencies in the TS, reduce operator work-arounds, improve and correct confusing and ambiguous TS requirements, and allow for process enhancements under 10CFR50.59.

Attachment 1 to this letter contains (by TS section) the revised TS and Bases, the markup of the current Technical Specifications (CTS) and the safety assessment discussion of changes (DOC) to the CTS. (Although not required for NRC approval, the revised Bases are included to facilitate review and understanding of the changes to the CTS.) Attachment 2 provides a listing of the affected TS and Bases pages. Attachment 3 provides the No Significant Hazards Consideration (NSHC) determination for all of the changes to the CTS. A compact disk containing an Adobe Acrobat version of the submittal package is also enclosed.

VY has reviewed the proposed TS changes in accordance with 10 CFR 50.92 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 10 CFR 51.22(c)(9) and do not require an environmental review. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared for these changes.

Upon acceptance of this proposed change by the NRC, VY requests that a license amendment be issued for implementation within 90 days of its effective date.

If you have any questions on this transmittal, please contact Mr. David J. Mannai at (802) 451-3304.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 12, 2008

Sincerely,

WFMaguire for T.A.S.

Ted A. Sullivan
Site Vice President
Vermont Yankee Nuclear Power Station

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Attachment 1:	Revised TS and Bases, Markup of CTS and DOCs to CTS
Attachment 2:	Listing of Affected TS and Bases Pages
Attachment 3	Determination of No Significant Hazards Consideration
Enclosure:	Compact Disk: Submittal Package

cc: Mr. Samuel J. Collins (w/o attachments)
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Docket No. 50-271

Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Change 273

Revised TS and TS Bases Pages, Marked-up Pages and Safety Assessment Discussion of Changes

Attachment 1 is organized in a manner similar to a request for conversion to Improved Standard Technical Specifications on a TS section/specification basis, generally as follows:

TAB 1: Proposed TS

This tab contains the re-typed, proposed TS.

TAB 2: Proposed Bases

This tab contains the re-typed, proposed Bases.

TAB 3: Current Technical Specification (CTS) Markups

This tab contains a copy of the CTS pages, tabulated and annotated to provide a cross-reference to the equivalent proposed TS requirements, showing the disposition of the existing requirements into the proposed TS.

The annotated copy of the CTS pages is marked with sequentially numbered "flags" which provide a cross-reference to a Safety Assessment Discussion of Change (DOC) between the CTS and the proposed TS. When the proposed TS requirement differs from the CTS requirement, the CTS being revised is annotated with an alpha-numeric designator. The associated DOC provides a justification for the proposed change.

The alpha-numeric designator is based on the category of the change and a sequential number within that category. The changes to the CTS are categorized as follows:

A ADMINISTRATIVE – associated with restructuring, interpretation, and complex rearranging of requirements, and other changes not substantially revising an existing requirement.

M TECHNICAL CHANGES – MORE RESTRICTIVE – changes to the CTS being proposed, resulting in adding restrictions or eliminating flexibility.

LA TECHNICAL CHANGES – LESS RESTRICTIVE – "Generic" - The "LA" changes consist of relocation of details out of the CTS and into the Bases, Technical Requirements Manual, or plant procedures. Typically, this involves details of system design and function or procedural details on methods of conducting a surveillance.

L TECHNICAL CHANGES – LESS RESTRICTIVE – "Specific" - The "L" changes reflect elimination of various instrumentation requirements, where the instrument is an alarm or an indication-only instrument function that does not otherwise meet the NRC TS selection criteria. The "L" changes also reflect other forms of revision of specifications resulting in requirements being relaxed, relocated, eliminated, or new flexibility being provided.

R RELOCATED – specific requirements that do not meet the NRC TS selection criteria. These items are being relocated to other plant documents as part of the TS revision.

TAB 4: <u>Safety Assessment Discussion of Changes</u>

This tab contains the Safety Assessment DOC for each proposed TS section, organized according to section and sub-section.

TABLE OF CONTENTS

Tab 3.C: TS 3.2.A/4.2.A – Emergency Core Cooling System (ECCS) System

Section 3.2.A/4.2.A (Pages 34, 38 – 44b, 59 – 63, and 74)

Tab 3.D: TS 3.2.B/4.2.B – Primary Containment Isolation

Section 3.2.B/4.2.B (Pages 34, 39, 40, 44 – 48a, 60, 64 - 66, and 74)

Tab 3.E: TS 3.2.C/4.2.C – Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

Section 3.2.C/4.2.C (Pages 34, 49, 49a, 67 and 74)

Tab 3.F: TS 3.2.D/4.2.D – Off-Gas System Initiation

Section 3.2.D/4.2.D (Pages 35, 50, 68 and 74)

Tab 3.G: TS 3.2.E/4.2.E - Control Rod Block Actuation

Section 3.2.E/4.2.E (Pages 35, 51, 52, 69 and 74)

Tab 3.H: TS 3.2.F/4.2.F – Mechanical Vacuum Pump Isolation Instrumentation

Section 3.2.F/4.2.F (Pages 35 and 36)

Tab 3.I: TS 3.2.G/4.2.G – Post-Accident Monitoring Instrumentation

Section 3.2.G/4.2.G (Pages 36, 53 - 55, 70, 71 and 74)

Tab 3.J: TS 3.2.H/4.2.H – Drywell to Torus ΔP Instrumentation

Section 3.2.H/4.2.H (Pages 36 and 37)

Tab 3.K: TS 3.2.I/4.2.I – Recirculation Pump Trip Instrumentation

Section 3.2.I/4.2.I (Pages 37, 43, 44, 44b, 55a, 63, 71a and 74)

Tab 3.L: TS 3.2.K/4.2.K – Degraded Grid Protective System

Section 3.2.K/4.2.K (Pages 37, 56, 72 and 74)

Tab 3.M: TS 3.2.L/4.2.L – Reactor Core Isolation Cooling (RCIC) System Actuation

Section 3.2.L/4.2.L (Pages 37, 57, 58, 73 and 74)

Tab 3.N: TS 3.5/4.5 – Core and Containment Cooling Systems

Section 3.5/4.5 (Pages 105, 107 and 114)

Tab 3.O: TS 1.1/2.1 - Bases for Fuel Cladding Safety Limits

Bases Section 1.1 (Page 13)
Bases Section 2.1 (Pages 14 – 17)

Tab 4 - Safety Assessment Discussion of Changes

Tab 4.A: Sections 1.0, 2.1 and 3.1/4.1 (Pages 1 – 19)

Tab 4.B: Section 3.2.A/4.2.A (Pages 20 – 32)

Tab 4.C: Section 3.2.B/4.2.B (Pages 33 – 48)

Tab 4.D: Section 3.2.C/4.2.C (Pages 49 – 56)

Tab 4.E: Section 3.2.D/4.2.D (Pages 57 – 58)

Tab 4.F: Section 3.2.E/4.2.E (Pages 59 – 63)

Tab 4.G: Section 3.2.F/4.2.F (Pages 64 – 65)

Tab 4.H: Section 3.2.G/4.2.G (Pages 66 – 70)

Tab 4.I: Section 3.2.H/4.2.H (Pages 71 – 72)

Tab 4.J: Section 3.2.I/4.2.I (Pages 73 – 79)

Tab 4.K: Section 3.2.K/4.2.K (Pages 80 – 84)

Tab 4.L: Section 3.2.L/4.2.L (Pages 85 – 89)

Tab 4.M: Section 3.5/4.5 (Page 90)

Tab 4.N: Bases for Section 1.1/2.1, 3.1/4.1 and 3.2/4.2 (Page 91)

Vermont Yankee Nuclear Power Station

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Tab 1

Revised Technical Specification Pages

Vermont Yankee Nuclear Power Station

Proposed Change 273

Revised Technical Specification Pages

Tab 1.A

Table of Contents, Definitions and Safety Limits

TABLE OF CONTENTS

Z. Surveillance Interval - Relocated to Specification 4.0.1.

AA. Deleted

BB. Source Check - The qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

CC. Dose Equivalent I-131 - The dose equivalent I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Federal Guidance Report (FGR) 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1988; FGR 12, "External Exposure to Radionuclides In Air, Water, and Soil," 1993; or NRC Regulatory Guide 1.109, Revision 1, October 1977.

DD. Deleted

EE. Deleted

FF. Deleted

GG. Deleted

HH. Deleted

II. Deleted

JJ. Deleted

KK. Deleted

LL. Deleted

MM. Deleted

NN. Core Operating Limits Report - The Core Operating Limits Report is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.6.C. Plant operation within these operating limits is addressed in individual specifications.

OO. Reactor Protection System (RPS) Response Time - RPS Response Time shall be the time from the opening of the sensor contact up to and including the opening of the scram solenoid relay.

1.1 SAFETY LIMIT

2.1 LIMITING SAFETY SYSTEM SETTING

For no combination of loop recirculation flow rate and core thermal power shall the APRM flux scram trip setting be allowed to exceed 120% of rated thermal power.

b. Flux Scram Trip Setting (Refuel or Startup/Hot Standby Mode)

When the reactor mode switch is in the REFUEL position (with reactor coolant temperature > 212 °F) or the STARTUP/HOT STANDBY position, average power range monitor (APRM) scram shall be set down to less than or equal to 15% of rated neutron flux. The IRM flux scram setting shall be set at less than or equal to 120/125 of full scale.

B. Deleted

C. Reactor low water level scram setting shall be at least 127 inches above the top of the enriched fuel.

1.1 SAFETY LIMIT

2.1 LIMITING SAFETY SYSTEM SETTING

D. Reactor low-low water level Emergency Core Cooling System (ECCS) initiation shall be ≥ 82.5 inches above the top of the enriched fuel.

E. When operating at > 25% of Rated Thermal Power, turbine stop valve scram shall be ≤ 10% valve closure from full open.

F. When operating at > 25% of Rated Thermal Power, turbine control valve fast closure scram shall be actuation of the turbine control valve fast closure relay.

G. Main steam line isolation valve closure scram shall be ≤ 10% valve closure from full open.

H. Main steam line low pressure initiation of main steam line isolation valve closure shall be ≥ 800 psig.

Vermont Yankee Nuclear Power Station

Proposed Change 273

Revised Technical Specification Pages

Tab 1.B

Reactor Protection System

3.1 LIMITING CONDITIONS FOR OPERATION

3.1 REACTOR PROTECTION SYSTEM (RPS)

Applicability:

Applies to the operability of plant instrumentation and control systems required for reactor safety.

Objective:

To specify the limits imposed on plant operation by those instrument and control systems required for reactor safety.

Specification:

A. The RPS instrumentation for each Trip Function in Table 3.1.1 shall be operable in accordance with Table 3.1.1.

4.1 SURVEILLANCE REQUIREMENTS

4.1 REACTOR PROTECTION SYSTEM (RPS)

Applicability:

Applies to the surveillance of the plant instrumentation and control systems required for reactor safety.

Objective:

To specify the type and frequency of surveillance to be applied to those instrument and control systems required for reactor safety.

Specification:

A.1 RPS instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.1.1. RPS testing shall also be performed as indicated in Surveillance Requirements 4.1.A.2 and 4.1.A.3.

When an RPS channel is placed in an inoperable status solely for the performance of required 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 RPS trip capability.

2. Exercise each automatic scram contactor once every week using the RPS channel test switches or by performing a Functional Test of any automatic RPS Trip Function.

3. Verify RPS Response Time is ≤ 50 milliseconds for each automatic RPS Trip Function once every Operating Cycle.

3.1 LIMITING CONDITIONS FOR OPERATION

4.1 SURVEILLANCE REQUIREMENTS

4. Perform a Logic System Functional Test of RPS instrumentation Trip Functions once every Operating Cycle.

Table 3.1.1 (page 1 of 3)
Reactor Protection System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
1. Reactor Mode Switch in Shutdown	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	1	Note 1	Note 2.a	NA
	Refuel[(b)]	1	Note 1	Note 2.d	NA
2. Manual Scram	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	1	Note 1	Note 2.a	NA
	Refuel[(b)]	1	Note 1	Note 2.d	NA
3. Intermediate Range Monitors (IRMs)					
a. High Flux	STARTUP/HOT STANDBY, Refuel[(a)]	2	Note 1	Note 2.a	≤ 120/125
	Refuel[(b)]	2	Note 1	Note 2.d	≤ 120/125
b. Inop	STARTUP/HOT STANDBY, Refuel[(a)]	2	Note 1	Note 2.a	NA
	Refuel[(b)]	2	Note 1	Note 2.d	NA

(a) With reactor coolant temperature > 212°F.

(b) With reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies.

Reactor Protection System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
4. Average Power Range Monitors (APRMs)					
a. High Flux (Flow Bias)	RUN	2	Note 1	Note 2.b	(c)
b. High Flux (Reduced)	STARTUP/HOT STANDBY, Refuel[a]	2	Note 1	Note 2.a	≤ 15%
c. Inop	RUN, STARTUP/HOT STANDBY, Refuel[a]	2	Note 1	Note 2.a	NA

(a) With reactor coolant temperature > 212°F.

(c) <u>Two loop operation:</u>
$S \leq 0.33W + 50.45\%$ for $0\% < W \leq 30.9\%$
$S \leq 1.07W + 27.23\%$ for $30.9\% < W \leq 66.7\%$
$S \leq 0.55W + 62.34\%$ for $66.7\% < W \leq 99.0\%$
With a maximum of 117.0% power
for $W > 99.0\%$

<u>Single loop operation:</u>
$S \leq 0.33W + 48.00\%$ for $0\% < W \leq 39.1\%$
$S \leq 1.07W + 19.01\%$ for $39.1\% < W \leq 61.7\%$
$S \leq 0.55W + 51.22\%$ for $61.7\% < W \leq 119.4\%$
With a maximum of 117.0% power
for $W > 119.4\%$

Table 3.1.1 (page 3 of 3)
Reactor Protection System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
5. High Reactor Pressure	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	2	Note 1	Note 2.a	≤ 1055 psig
6. High Drywell Pressure	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	2	Note 1	Note 2.a	≤ 2.5 psig
7. Reactor Low Water Level	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	2	Note 1	Note 2.a	≥ 127.0 inches
8. Scram Discharge Volume High Level	RUN, STARTUP/HOT STANDBY, Refuel[(a)]	2 per volume	Note 1	Note 2.a	≤ 21.0 gallons
	Refuel[(b)]	2 per volume	Note 1	Note 2.d	≤ 21.0 gallons
9. Main Steam Line Isolation Valve Closure	RUN	8	Note 1	Note 2.b	≤ 10% valve closure
10. Turbine Control Valve Fast Closure	> 25% RATED THERMAL POWER	2	Note 1	Note 2.c	(d)
11. Turbine Stop Valve Closure	> 25% RATED THERMAL POWER	4	Note 1	Note 2.c	≤ 10% valve closure

(a) With reactor coolant temperature > 212°F.

(b) With reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) Channel signals for the turbine control valve fast closure trip shall be derived from the same event or events which cause the control valve fast closure.

Table 3.1.1 ACTION Notes

1. With one or more required Reactor Protection System channels inoperable, take all of the applicable Actions in Notes 1.a, 1.b, and 1.c below.

   a. With one or more Trip Functions with one or more required channels inoperable:

      1) Place an inoperable channel for each Trip Function in trip within 12 hours; or

      2) Place the associated trip system in trip within 12 hours.

   b. With one or more Trip Functions with one or more required channels inoperable in both trip systems:

      1) Place an inoperable channel in one trip system in trip within 6 hours; or

      2) Place one trip system in trip within 6 hours.

   c. With one or more Trip Functions with Reactor Protection System trip capability not maintained:

      1) Restore Reactor Protection System trip capability within 1 hour.

   If any applicable Action and associated completion time of Notes 1.a, 1.b, or 1.c is not met, take the applicable Action of Note 2 below referenced in Table 3.1.1 for the channel.

2. a. Place the reactor in HOT SHUTDOWN within 12 hours.

   b. Place the reactor in STARTUP/HOT STANDBY within 8 hours.

   c. Reduce reactor power to $\leq$ 25% Rated Thermal Power within 8 hours.

   d. Immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.

Table 4.1.1 (page 1 of 3)
Reactor Protection System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Reactor Mode Switch in Shutdown	NA	Each Refueling Outage	NA
2. Manual Scram	NA	Every 3 Months	NA
3. Intermediate Range Monitors (IRMs)			
a. High Flux	Once/Day, (a)	Within 31 Days Before entering STARTUP/HOT STANDBY[b] and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling	Once/Operating Cycle[b],[c]
b. Inop	NA	Within 31 Days Before entering STARTUP/HOT STANDBY[b] and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling	NA
4. Average Power Range Monitors (APRMs)			
a. High Flux (Flow Bias)	NA	Every 3 Months	Every 7 Days for Output Signal by Heat Balance[d], Every 3 Months[e], Each Refueling Outage for Flow Bias, Every 2000 MWD/T Average Core Exposure for LPRMs using TIP System

(a) IRM and Source Range Monitor channels shall be determined to overlap during each startup after entering STARTUP/HOT STANDBY MODE and IRM and APRM channels shall be determined to overlap during each controlled shutdown, if not performed in the previous 7 days.

(b) Not required to be completed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.

(c) Neutron detectors are excluded.

(d) Not required to be completed until 12 hours after reactor power is ≥ 23% Rated Thermal Power.

(e) Trip unit calibration only.

Table 4.1.1 (page 2 of 3)
Reactor Protection System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
4. APRMs (continued)			
b. High Flux (Reduced)	(a)	Within 7 Days Before entering STARTUP/HOT STANDBY[b] and Every 7 Days During STARTUP/HOT STANDBY, Every 7 Days During Refueling	Within 7 Days Before entering STARTUP/HOT STANDBY and Every 7 Days During STARTUP/ HOT STANDBY [(b),(c),(e)] Every 7 Days During Refueling[((c),(e)]
c. Inop	NA	Every 3 Months	NA
5. High Reactor Pressure	Once/Day	Every 3 Months	Every 3 Months[(e)], Once/Operating Cycle
6. High Drywell Pressure	NA	Every 3 Months	Every 3 Months[(e)], Once/Operating Cycle
7. Reactor Low Water Level	Once/Day	Every 3 Months	Every 3 Months[(e)], Once/Operating Cycle
8. Scram Discharge Volume High Level	NA	Every 3 Months	Every 3 Months[(e)], Once/Operating Cycle
9. Main Steam Line Isolation Valve Closure	NA	Every 3 Months	Each Refueling Outage
10. Turbine Control Valve Fast Closure	NA	Every 3 Months	Every 3 Months
a. First Stage Turbine Pressure Permissive	NA	Every 6 Months	Every 6 Months and prior to entering STARTUP/HOT STANDBY for plant startup after Refueling

(a) IRM and Source Range Monitor channels shall be determined to overlap during each startup after entering STARTUP/HOT STANDBY MODE and IRM and APRM channels shall be determined to overlap during each controlled shutdown, if not performed in the previous 7 days.

(b) Not required to be completed when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE.

(c) Neutron detectors are excluded.

(e) Trip unit calibration only.

Table 4.1.1 (page 3 of 3)
Reactor Protection System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
11. Turbine Stop Valve Closure	NA	Every 3 Months	Each Refueling Outage
a. First Stage Turbine Pressure Permissive	NA	Every 6 Months	Every 6 Months and prior to entering STARTUP/HOT STANDBY for plant startup after Refueling

3.1 LIMITING CONDITIONS FOR OPERATION

4.1 SURVEILLANCE REQUIREMENTS

This page has been deleted.

Vermont Yankee Nuclear Power Station

Proposed Change 273

Revised Technical Specification Pages

Tab 1.C

ECCS System

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the operational status of the plant instrumentation systems which initiate and control a protective function.

Objective:

To assure the operability of protective instrumentation systems.

Specification:

A. Emergency Core Cooling System (ECCS)

The ECCS instrumentation for each Trip Function in Table 3.2.1 shall be operable in accordance with Table 3.2.1.

4.2 SURVEILLANCE REQUIREMENTS

4.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the surveillance requirements of the instrumentation systems which initiate and control a protective function.

Objective:

To verify the operability of protective instrumentation systems.

Specification:

A. Emergency Core Cooling System (ECCS)

1. ECCS instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.1.

   When an ECCS instrumentation channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed as follows: (a) for up to 6 hours for Trip Function 3.d; and (b) for up to 6 hours for Trip Functions other than 3.d provided the associated Trip Function or redundant Trip Function maintains ECCS initiation capability.

2. Perform a Logic System Functional Test of ECCS instrumentation Trip Functions once every Operating Cycle.

Table 3.2.1 (page 1 of 4)
Emergency Core Cooling System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Core Spray System				
a. High Drywell Pressure	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2	Note 1	≤ 2.5 psig
b. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a), (b)	2	Note 1	≥ 82.5 inches
c. Low Reactor Pressure (Initiation)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a), (b)	1	Note 2	≥ 300 psig and ≤ 350 psig
d. Low Reactor Pressure (System Ready and Valve Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a), (b)	2	Note 2	≥ 300 psig and ≤ 350 psig
e. Pump Start Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a) , (b)	1	Note 2	≥ 8 seconds and ≤ 10 seconds
f. Pump Discharge Pressure	RUN, STARTUP/HOT STANDBY(c), HOT SHUTDOWN(c), Refuel(c)	2 per pump	Note 8	≥ 100 psig
g. Auxiliary Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a), (b)	1	Note 2	NA
h. Pump Bus Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a), (b)	1	Note 2	NA

(a) With reactor coolant temperature > 212 °F.

(b) When associated ECCS subsystem is required to be operable.

(c) With reactor steam pressure > 150 psig.

Table 3.2.1 (page 2 of 4)
Emergency Core Cooling System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
2. Low Pressure Coolant Injection (LPCI) System				
a. Low Reactor Pressure (Initiation)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	1	Note 2	≥ 300 psig and ≤ 350 psig
b. High Drywell Pressure (Initiation)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	2	Note 1	≤ 2.5 psig
c. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	2	Note 1	≥ 82.5 inches
d. Reactor Vessel Shroud Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	1	Note 3	≥ 2/3 core height
e. LPCI B and C Pump Start Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	1	Note 2	≥ 3 seconds and ≤ 5 seconds
f. RHR Pump Discharge Pressure	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	2 per pump	Note 8	≥ 100 psig
g. High Drywell Pressure (Containment Spray Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	2	Note 3	≤ 2.5 psig
h. Low Reactor Pressure (System Ready and Valve Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	2	Note 2	≥ 300 psig and ≤ 350 psig

(a) With reactor coolant temperature > 212 °F.

(b) When associated ECCS subsystem is required to be operable.

(c) With reactor steam pressure > 150 psig.

Table 3.2.1 (page 3 of 4)
Emergency Core Cooling System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
2. LPCI System (Continued)				
i. Auxiliary Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	1	Note 2	NA
j. Pump Bus Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	1	Note 2	NA
3. High Pressure Coolant Injection (HPCI) System				
a. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	2	Note 4	≥ 82.5 inches
b. Low Condensate Storage Tank Water Level	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	2	Note 5	≥ 4.24%[d]
c. High Drywell Pressure	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	2	Note 4	≤ 2.5 psig
d. High Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	2	Note 6	≤ 177 inches

(a) With reactor coolant temperature > 212 °F.

(b) When associated ECCS subsystem is required to be operable.

(c) With reactor steam pressure > 150 psig.

(d) Percent of instrument span.

Table 3.2.1 (page 4 of 4)
Emergency Core Cooling System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
4. Automatic Depressurization System (ADS)				
a. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY[(c)], HOT SHUTDOWN[(c)], Refuel[(c)]	2	Note 7	≥ 82.5 inches
b. High Drywell Pressure	RUN, STARTUP/HOT STANDBY[(c)], HOT SHUTDOWN[(c)], Refuel[(c)]	2	Note 7	≤ 2.5 psig
c. Time Delay	RUN, STARTUP/HOT STANDBY[(c)], HOT SHUTDOWN[(c)], Refuel[(c)]	1	Note 8	≤ 120 seconds
d. Sustained Low-Low Reactor Vessel Water Level Time Delay	RUN, STARTUP/HOT STANDBY[(c)], HOT SHUTDOWN[(c)], Refuel[(c)]	2	Note 8	≤ 8 minutes

(c) With reactor steam pressure > 150 psig.

Table 3.2.1 ACTION Notes

1. With one or more channels inoperable for ECCS instrumentation Trip Functions 1.a, 1.b, 2.b and 2.c:
   a. Declare the associated systems inoperable within 1 hour from discovery of loss of initiation capability for feature(s) in both divisions; and
   b. Place any inoperable channel in trip within 24 hours.

   If any applicable Action and associated completion time of Note 1.a or 1.b is not met, immediately declare associated systems inoperable.

2. With one or more channels inoperable for ECCS instrumentation Trip Functions 1.c, 1.d, 1.e, 1.g, 1.h, 2.a, 2.e, 2.h, 2.i and 2.j:
   a. Declare the associated systems inoperable within 1 hour from discovery of loss of initiation capability for feature(s) in both divisions; and
   b. Restore any inoperable channel to operable status within 24 hours.

   If any applicable Action and associated completion time of Note 2.a or 2.b is not met, immediately declare associated systems inoperable.

3. With one or more channels inoperable for ECCS instrumentation Trip Functions 2.d and 2.g:
   a. For Trip Function 2.g only, declare the associated system inoperable within 1 hour from discovery of loss of LPCI initiation capability; and
   b. For Trip Function 2.g, place any inoperable channel in trip within 24 hours.
   c. For Trip Function 2.d restore any inoperable channel to operable status within 24 hours.

   If any applicable Action and associated completion time of Note 3.a, 3.b or 3.c is not met, immediately declare associated systems inoperable.

4. With one or more channels inoperable for ECCS instrumentation Trip Functions 3.a and 3.c:
   a. Declare the HPCI System inoperable within 1 hour from discovery of loss of HPCI System initiation capability; and
   b. Place any inoperable channel in trip within 24 hours.

   If any applicable Action and associated completion time of Note 4.a or 4.b is not met, immediately declare HPCI System inoperable.

5. With one or more channels inoperable for ECCS instrumentation Trip Function 3.b:
   a. Declare the HPCI System inoperable within 1 hour from discovery of loss of HPCI initiation capability when HPCI System suction is aligned to the Condensate Storage Tank; and
   b. Place any inoperable channel in trip or align HPCI System suction to the suppression pool within 24 hours.

   If any applicable Action and associated completion time of Note 5.a or 5.b is not met, immediately declare the HPCI System inoperable.

Table 3.2.1 ACTION Notes
(Continued)

6. With one or more channels inoperable for ECCS instrumentation Trip Function 3.d:
   a. Restore any inoperable channel to operable status within 24 hours.

   If the Action and associated completion time of Note 6.a is not met, immediately declare the HPCI System inoperable.

7. With one or more channels inoperable for ECCS instrumentation Trip Functions 4.a and 4.b:
   a. Declare ADS inoperable within 1 hour from discovery of loss of ADS initiation capability in both trip systems; and
   b. Place any inoperable channel in trip within 96 hours from discovery of the inoperable channel concurrent with HPCI System or RCIC System inoperable, and
   c. Place any inoperable channel in trip within 8 days.

   If any applicable Action and associated completion time of Note 7.a, 7.b or 7.c is not met, immediately declare ADS inoperable.

8. With one or more channels inoperable for ECCS instrumentation Trip Functions 1.f, 2.f, 4.c and 4.d:
   a. Declare ADS inoperable within 1 hour from discovery of loss of ADS initiation capability in both trip systems; and
   b. Restore any inoperable channel to operable status within 96 hours from discovery of the inoperable channel concurrent with HPCI System or RCIC System inoperable, and
   c. Restore any inoperable channel to operable status within 8 days.

   If any applicable Action and associated completion time of Note 8.a, 8.b or 8.c is not met, immediately declare ADS inoperable.

Table 4.2.1 (page 1 of 2)
Emergency Core Cooling System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Core Spray System			
a. High Drywell Pressure	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
c. Low Reactor Pressure (Initiation)	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
d. Low Reactor Pressure (System Ready and Valve Permissive)	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
e. Pump Start Time Delay	NA	NA	Once/Operating Cycle
f. Pump Discharge Pressure	NA	Every 3 Months	Every 3 Months
g. Auxiliary Power Monitor	Once/Day	Every 3 Months	NA
h. Pump Bus Power Monitor	Once/Day	Every 3 Months	NA
2. Low Pressure Coolant Injection (LPCI) System			
a. Low Reactor Pressure (Initiation)	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. High Drywell Pressure (Initiation)	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
c. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
d. Reactor Vessel Shroud Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
e. LPCI B and C Pump Start Time Delay	NA	NA	Once/Operating Cycle
f. RHR Pump Discharge Pressure	NA	Every 3 Months	Every 3 Months
g. High Drywell Pressure (Containment Spray Permissive)	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle

(a) Trip unit calibration only.

Table 4.2.1 (page 2 of 2)
Emergency Core Cooling System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
2. LPCI System (Continued)			
h. Low Reactor Pressure (System Ready and Valve Permissive)	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
i. Auxiliary Power Monitor	Once/Day	Every 3 Months	NA
j. Pump Bus Power Monitor	Once/Day	Every 3 Months	NA
3. High Pressure Coolant Injection (HPCI) System			
a. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. Low Condensate Storage Tank Water Level	NA	Every 3 Months	Every 3 Months
c. High Drywell Pressure	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
d. High Reactor Vessel Water Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
4. Automatic Depressurization System (ADS)			
a. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. High Drywell Pressure	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
c. Time Delay	NA	NA	Once/Operating Cycle
d. Sustained Low-Low Reactor Vessel Water Level Time Delay	NA	NA	Once/Operating Cycle

(a) Trip unit calibration only.

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Tab 1.D

Primary Containment Isolation

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 PROTECTIVE INSTRUMENT SYSTEMS

B. Primary Containment Isolation

The primary containment isolation instrumentation for each Trip Function in Table 3.2.2 shall be operable in accordance with Table 3.2.2.

4.2 SURVEILLANCE REQUIREMENTS

4.2 PROTECTIVE INSTRUMENT SYSTEMS

B. Primary Containment Isolation

1. The primary containment isolation instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.2.

   When a primary containment isolation 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.

2. Perform a Logic System Functional Test of Primary Containment isolation instrumentation Trip Functions once every Operating Cycle.

Table 3.2.2 (page 1 of 3)
Primary Containment Isolation Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
1. Main Steam Line Isolation					
a. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2	Note 1	Note 2.a	≥ 82.5 inches
b. High Main Steam Line Area Temperature	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	8	Note 1	Note 2.a	≤ 196 °F for channels monitoring outside steam tunnel and ≤ 200 °F for channels monitoring inside steam tunnel
c. High Main Steam Line Flow	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2 per main steam line	Note 1	Note 2.a	≤ 140% of rated flow
d. Low Main Steam Line Pressure	RUN	2	Note 1	Note 2.c	≥ 800 psig
e. High Main Steam Line Flow - Not in RUN	STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2	Note 1	Note 2.a	≤ 40% of rated flow
f. Condenser Low Vacuum	RUN, STARTUP/HOT STANDBY(b), HOT SHUTDOWN(b), Refuel(a and b)	2	Note 1	Note 2.a	≤ 12 inches Hg absolute
2. Primary Containment Isolation					
a. Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2	Note 1	Note 2.b	≥ 127.0 inches
b. High Drywell Pressure	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel(a)	2	Note 1	Note 2.b	≤ 2.5 psig

(a) With reactor coolant temperature > 212 °F.

(b) With any turbine stop valve or turbine bypass valve not closed.

Table 3.2.2 (page 2 of 3)
Primary Containment Isolation Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
3. High Pressure Coolant Injection (HPCI) System Isolation					
a. High Steam Line Space Temperature	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	6	Note 1	Note 2.d	≤ 196 °F
b. High Steam Line d/p (Steam Line Break)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	1	Note 1	Note 2.d	≤ 195 inches of water
c. Low Steam Supply Pressure	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]	4	Note 1	Note 2.d	≥ 70 psig
d. High Main Steam Line Tunnel Temperature	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	2	Note 1	Note 2.d	≤ 200 °F
e. High Main Steam Line Tunnel Temperature Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	1	Note 1	Note 2.d	≤ 35 minutes
4. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. High Main Steam Line Tunnel Temperature	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	2	Note 1	Note 2.d	≤ 200 °F
b. High Main Steam Line Tunnel Temperature Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	1	Note 1	Note 2.d	≤ 35 minutes
c. High Steam Line Space Temperature	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	6	Note 1	Note 2.d	≤ 196 °F

(a) With reactor coolant temperature > 212 °F.

(c) With reactor steam pressure > 150 psig.

Table 3.2.2 (page 3 of 3)
Primary Containment Isolation Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	ACTIONS REFERENCED FROM ACTION NOTE 1	TRIP SETTING
4. RCIC System Isolation (Continued)					
d. High Steam Line d/p (Steam Line Break)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[(a)]	1	Note 1	Note 2.d	≤ 195 inches of water
e. High Steam Line d/p Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[(a)]	1	Note 1	Note 2.d	≥ 3 seconds and ≤ 7 seconds
f. Low Steam Supply Pressure	RUN, STARTUP/HOT STANDBY[(c)], HOT SHUTDOWN[(c)], Refuel[(c)]	4	Note 1	Note 2.d	≥ 50 psig
5. Residual Heat Removal Shutdown Cooling Isolation					
a. High Reactor Pressure	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN' Refuel[(a)]	1	Note 1	Note 2.d	≤ 150 psig

(a) With reactor coolant temperature > 212 °F.

(c) With reactor steam pressure > 150 psig.

Table 3.2.2 ACTION Notes

1. With one or more required Primary Containment Isolation Instrumentation channels inoperable, take all of the applicable Actions in Notes 1.a and 1.b below.

   a. With one or more Trip Functions with one or more required channels inoperable:

      1) For Trip Functions 2.a and 2.b, place any inoperable channel in trip within 12 hours; and
      2) For Trip Functions 3.e, 4.b, and 4.e, restore any inoperable channel to operable status within 24 hours; and
      3) For all other Trip Functions, place any inoperable channel in trip within 24 hours.

   b. With one or more Trip Functions with isolation capability not maintained:

      1) Restore isolation capability within 1 hour.

   Penetration flow paths, isolated as a result of complying with the above Actions, may be unisolated intermittently under administrative controls.

   If any applicable and associated completion time of Note 1.a or 1.b is not met, take the applicable Actions of Note 2 below and referenced in Table 3.2.2 for the channel.

2. a. Isolate the associated Main Steam Line within 12 hours (penetration flow paths may be unisolated intermittently under administrative control); or Place the reactor in HOT SHUTDOWN within 12 hours and place the reactor in COLD SHUTDOWN within the next 12 hours.

   b. Place the reactor in COLD SHUTDOWN within 24 hours.

   c. Place the reactor in STARTUP/HOT STANDBY within 8 hours.

   d. Isolate the affected penetration flow path within 1 hour (penetration flow paths may be unisolated intermittently under administrative control).

Table 4.2.2 (page 1 of 2)
Primary Containment Isolation Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Main Steam Line Isolation			
a. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. High Main Steam Line Area Temperature	NA	Every 3 Months	Each Refueling Outage
c. High Main Steam Line Flow	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
d. Low Main Steam Line Pressure	NA	Every 3 Months	Every 3 Months
e. High Main Steam Line Flow - Not in RUN	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
f. Condenser Low Vacuum	NA	Every 3 Months	Every 3 Months
2. Primary Containment Isolation			
a. Low Reactor Vessel Water Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
b. High Drywell Pressure	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
3. High Pressure Coolant Injection (HPCI) System Isolation			
a. High Steam Line Space Temperature	NA	Every 3 Months	Each Refueling Outage
b. High Steam Line d/p (Steam Line Break)	NA	Every 3 Months	Every 3 Months
c. Low Steam Supply Pressure	NA	Every 3 Months	Every 3 Months
d. High Main Steam Line Tunnel Temperature	NA	Every 3 Months	Each Refueling Outage
e. High Main Steam Line Tunnel Temperature Time Delay	NA	NA	Once/Operating Cycle

(a) Trip unit calibration only.

Table 4.2.2 (page 2 of 2)
Primary Containment Isolation Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
4. Reactor Core Isolation Cooling (RCIC) System Isolation			
a. High Main Steam Line Tunnel Temperature	NA	Every 3 Months	Each Refueling Outage
b. High Main Steam Line Tunnel Temperature Time Delay	NA	NA	Once/Operating Cycle
c. High Steam Line Space Temperature	NA	Every 3 Months	Each Refueling Outage
d. High Steam Line d/p (Steam Line Break)	NA	Every 3 Months	Every 3 Months
e. High Steam Line d/p (Steam Line Break) Time Delay	NA	Every 3 Months	Every 3 Months
f. Low Steam Supply Pressure	NA	Every 3 Months	Every 3 Months
5. Residual Heat Removal Shutdown Cooling Isolation			
a. High Reactor Pressure	NA	Every 3 Months	Every 3 Months

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Tab 1.E

RB Ventilation Isolation and SBGT System Initiation

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 PROTECTIVE INSTRUMENT SYSTEMS

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

The reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation for each Trip Function in Table 3.2.3 shall be operable in accordance with Table 3.2.3.

4.2 SURVEILLANCE REQUIREMENTS

4.2 PROTECTIVE INSTRUMENT SYSTEMS

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

1. The reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.3.

   When a channel is placed in an inoperable status solely for performance of required instrumentation surveillances, entry into the associated Limiting Conditions for Operation and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains reactor building ventilation isolation capability and Standby Gas Treatment System initiation capability.

2. Perform a Logic System Functional Test of reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation Trip Functions once every Operating Cycle.

Table 3.2.3 (page 1 of 1)
Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)	2	Note 1	≥ 127.0 inches
2. High Drywell Pressure	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]	2	Note 1	≤ 2.5 psig
3. High Reactor Building Ventilation Radiation	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b), (c), (d)	1	Note 1	≤ 14 mR/hr
4. High Refueling Floor Zone Radiation	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b), (c), (d)	1	Note 1	≤ 100 mR/hr

(a) With reactor coolant temperature > 212 °F.

(b) During operations with potential for draining the reactor vessel.

(c) During movement of irradiated fuel assemblies or fuel cask in secondary containment.

(d) During Alteration of the Reactor Core.

Table 3.2.3 ACTION Note

1. With one or more required Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation channels inoperable, take all of the applicable Actions in Notes 1.a and 1.b below.

   a. With one or more Trip Functions with one or more required channels inoperable:

      1) For Trip Functions 1 and 2, place any inoperable channel in trip within 12 hours; and
      2) For Trip Functions 3 and 4, place any inoperable channel in trip within 24 hours.

   b. With one or more Trip Functions with isolation or initiation capability not maintained:

      1) Restore isolation and initiation capability within 1 hour.

   If any applicable Action and associated completion time of Note 1.a or 1.b is not met, isolate the Reactor Building Ventilation System and place the Standby Gas Treatment System in operation within 1 hour.

Table 4.2.3 (page 1 of 1)
Reactor Building Ventilation Isolation and
Standby Gas Treatment System Initiation Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Low Reactor Vessel Water Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
2. High Drywell Pressure	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
3. High Reactor Building Ventilation Radiation	Once/Day	Every 3 Months	Every 3 Months
4. High Refueling Floor Zone Radiation	Once/Day During Refueling	Every 3 Months	Every 3 Months

(a) Trip unit calibration only.

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Tab 1.F

Off-Gas System Initiation (Deleted)

Control Rod Block Actuation

3.2 LIMITING CONDITIONS FOR OPERATION

D. Deleted.

E. Control Rod Block Actuation

The control rod block instrumentation for each Trip Function in Table 3.2.5 shall be operable in accordance with Table 3.2.5.

4.2 SURVEILLANCE REQUIREMENTS

D. Deleted.

E. Control Rod Block Actuation

1. The control rod block instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.5.

   When a Rod Block Monitor channel is placed in an inoperable status solely for performance of required 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 control rod block initiation capability.

Table 3.2.5 (page 1 of 1)
Control Rod Block Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP FUNCTION	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Rod Block Monitor				
a. Upscale (Flow Bias)	> 30% RATED THERMAL POWER	2	Note 1	$\leq 0.66(W)+N^{(b)}$ with a maximum as defined in the COLR
b. Downscale	> 30% RATED THERMAL POWER	2	Note 1	$\geq$ 2/125 full scale
c. Inop	> 30% RATED THERMAL POWER	2	Note 1	NA
2. Reactor Mode Switch - Shutdown Position	(a)	2	Note 2	NA

(a) When reactor mode switch is in the shutdown position.

(b) Trip Setting $\leq 0.66\ (W-\Delta W)+N$ for single loop operation.

Table 3.2.5 ACTION Notes

1. With one or two RBM channels inoperable, take all of the applicable Actions in Notes 1.a and 1.b below.

   a. If one RBM channel is inoperable, restore the inoperable channel to operable status within 24 hours.

   b. If the required Action and associated completion time of Note 1.a above is not met, or if two RBM channels are inoperable, place one RBM channel in trip within the next hour.

2. With one or more Reactor Mode Switch - Shutdown Position channels inoperable, immediately suspend control rod withdrawal and immediately initiate actions to fully insert all insertable control rods in core cells containing one or more fuel assemblies.

Table 4.2.5 (page 1 of 1)
Control Rod Block Instrumentation
Tests and Frequencies

TRIP FUNCTION	FUNCTIONAL TEST	CALIBRATION
1. Rod Block Monitor (RBM)		
a. Upscale (Flow Bias)	Every 3 Months	Every 3 Months[(b)] [(c)]
b. Downscale	Every 3 Months	Every 3 Months[(b)]
c. Inop	Every 3 Months	NA
2. Reactor Mode Switch - Shutdown Position	Every Refueling Outage[(a)]	NA

(a) Required to be completed within 1 hour after the reactor mode switch is placed in the shutdown position.

(b) Neutron detectors are excluded.

(c) Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

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Tab 1.G

Mechanical Vacuum Pump Isolation

3.2 LIMITING CONDITIONS FOR OPERATION

F. Mechanical Vacuum Pump Isolation Instrumentation

1. When the reactor is in the RUN or STARTUP/HOT STANDBY Mode and the mechanical vacuum pump is in service, 4 channels of the High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be operable.

4.2 SURVEILLANCE REQUIREMENTS

F. Mechanical Vacuum Pump Isolation Instrumentation

1. The High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be checked, functionally tested and calibrated as indicated in Surveillance Requirements 4.2.F.1.a, b, c, d and e.

   When a channel is placed in an inoperable status solely for performance of required 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 mechanical vacuum pump isolation capability.

   a. Perform an Instrument Check once each day.

   b. Perform an Instrument Functional Test once every 3 months.

   c. Perform an Instrument Calibration, except for radiation detectors, using a current source once every 3 months. The Trip Setting shall be $\leq$ 3.0 X background at rated thermal power.

   d. Perform an Instrument Calibration using a radiation source once each Refueling Outage.

   e. Perform a Logic System Functional Test, including mechanical vacuum pump isolation valve, once every Operating Cycle.

3.2 LIMITING CONDITIONS FOR OPERATION

4.2 SURVEILLANCE REQUIREMENTS

2. If Specification 3.2.F.1 is not met, take all of the applicable Actions in Specifications 3.2.F.2.a and 2.b below.

   a. With one or more channels inoperable:

      1) Restore any inoperable channel to operable status within 12 hours; or

      2) Place any inoperable channel or associated trip system in the trip condition within 12 hours (not applicable if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve).

   b. If the required Action and associated completion time of Specification 3.2.F.2.a above is not met, or if mechanical vacuum pump isolation capability is not maintained:

      1) Isolate the mechanical vacuum pump within 12 hours; or

      2) Isolate the main steam lines within 12 hours; or

      3) Place the reactor in the SHUTDOWN Mode within 12 hours.

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Tab 1.H

Post-Accident Monitoring Instrumentation

3.2 LIMITING CONDITIONS FOR OPERATION

G. Post-Accident Monitoring Instrumentation

The post-accident monitoring instrumentation for each Function in Table 3.2.6 shall be operable in accordance with Table 3.2.6.

4.2 SURVEILLANCE REQUIREMENTS

G. Post-Accident Monitoring Instrumentation

1. The post-accident monitoring instrumentation shall be checked and calibrated in accordance with Table 4.2.6.

   When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed for up to 6 hours.

Table 3.2.6 (page 1 of 1)
Post-Accident Monitoring Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE
1.	Drywell Atmospheric Temperature	RUN, STARTUP/HOT STANDBY	2	Note 1
2.	Drywell Pressure	RUN, STARTUP/HOT STANDBY	2	Note 1
3.	Torus Pressure	RUN, STARTUP/HOT STANDBY	2	Note 1
4.	Torus Water Level	RUN, STARTUP/HOT STANDBY	2	Note 1
5.	Torus Water Temperature	RUN, STARTUP/HOT STANDBY	2	Note 1
6.	Reactor Pressure	RUN, STARTUP/HOT STANDBY	2	Note 1
7.	Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY	2	Note 1
8.	Torus Air Temperature	RUN, STARTUP/HOT STANDBY	2	Note 1
9.	Containment High Range Radiation Monitor	RUN, STARTUP/HOT STANDBY	2	Note 2

Table 3.2.6 ACTION Notes

1. With one or more Post-Accident Monitoring instrumentation channels, for Functions other than Function 9, inoperable, take all of the applicable Actions in Notes 1.a and 1.b below.

   a. With one or more Functions with one channel inoperable:

      1) Restore channel to operable status within 30 days; or
      2) Prepare and submit a special report to the Commission within the next 14 days, outlining the Action taken, the cause of the inoperability, and the plans and schedule for restoring the channel to operable status.

   b. With one or more Functions with two channels inoperable:

      1) Restore one required channel to operable status within 7 days; or
      2) Place the reactor in HOT SHUTDOWN within the next 12 hours.

2. With one or more Post - Accident Monitoring instrumentation Function 9 channels inoperable, take all of the applicable Actions in Notes 2.a and 2.b below.

   a. With one channel inoperable:

      1) Restore channel to operable status within 30 days; or
      2) Prepare and submit a special report to the Commission within the next 14 days, outlining the Action taken, the cause of the inoperability, and the plans and schedule for restoring the channel to operable status.

   b. With two channels inoperable:

      1) Restore one channel to operable status within 7 days; or
      2) Prepare and submit a special report to the Commission within the next 14 days, outlining the Action taken, the cause of the inoperability, and the plans and schedule for restoring the channels to operable status.

Table 4.2.6 (page 1 of 1)
Post-Accident Monitoring Instrumentation
Tests and Frequencies

	FUNCTION	CHECK	CALIBRATION
1.	Drywell Atmospheric Temperature	Once/Day	Every 6 Months
2.	Drywell Pressure	Once/Day	Once/Operating Cycle
3.	Torus Pressure	Once/Day	Once/Operating Cycle
4.	Torus Water Level	Once/Day	Once/Operating Cycle
5.	Torus Water Temperature	Once/Day	Every 6 Months
6.	Reactor Pressure	Once/Day	Once/Operating Cycle
7.	Reactor Vessel Water Level	Once/Day	Once/Operating Cycle
8.	Torus Air Temperature	Once/Day	Every 6 Months
9.	Containment High Range Radiation Monitor	Once/Day	Once/Operating Cycle

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Tab 1.I

DW to Torus ΔP Instrumentation (Deleted)

Recirculation Pump Trip Instrumentation

3.2 LIMITING CONDITIONS FOR OPERATION

H. Deleted.

I. Recirculation Pump Trip Instrumentation

The recirculation pump trip instrumentation for each Trip Function in Table 3.2.7 shall be operable in accordance with Table 3.2.7.

J. Deleted.

4.2 SURVEILLANCE REQUIREMENTS

H. Deleted.

I. Recirculation Pump Trip Instrumentation

1. The recirculation pump trip instrumentation shall be checked, functionally tested and calibrated in accordance with Table 4.2.7.

   When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operations and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains recirculation pump trip capability.

2. Perform a Logic System Functional Test, including recirculation pump trip breaker actuation, of recirculation pump trip instrumentation Trip Functions once every Operating Cycle.

J. Deleted

Table 3.2.7 (page 1 of 1)
Recirculation Pump Trip Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Low-Low Reactor Vessel Water Level	RUN	2	Note 1	≥ 82.5 inches
2. Time Delay	RUN	2	Note 1	≤ 10 seconds
3. High Reactor Pressure	RUN	2	Note 1	≤ 1150 psig

Table 3.2.7 ACTION Notes

1. With one or more recirculation pump trip instrumentation channels inoperable, take all of the applicable Actions in Notes 1.a, 1.b and 1.c below.

   a. With one or more Trip Functions with one or more channels inoperable:

      1) Restore any inoperable channel to operable status within 14 days; or
      2) Place any inoperable channel in trip within 14 days (not applicable for Trip Function 2 channels and not applicable if the inoperable channel is the result of an inoperable recirculation pump trip breaker).

   b. With Trip Functions 1 and 2 with recirculation pump trip capability not maintained or with Trip Function 3 with recirculation pump trip capability not maintained:

      1) Restore recirculation pump trip capability within 72 hours.

   c. With Trip Functions 1, 2 and 3 with recirculation pump trip capability not maintained:

      1) Restore recirculation pump trip capability for all but one Trip Function within 1 hour.

   If any applicable Action and associated completion time of Note 1.a, 1.b or 1.c is not met, immediately take the applicable Action of Note 2.a or 2.b.

2. a. Remove affected recirculation pump from service within the next 6 hours; or

   b. Place the plant in STARTUP/HOT STANDBY within the next 6 hours.

Table 4.2.7 (page 1 of 1)
Recirculation Pump Trip Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
2. Time Delay	NA	NA	Every 3 Months
3. High Reactor Pressure	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle

(a) Trip unit calibration only.

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Tab 1.J

Degraded Grid Protective System

3.2 LIMITING CONDITIONS FOR OPERATION

K. Degraded Grid Protective System

The emergency bus undervoltage instrumentation for each Trip Function in Table 3.2.8 shall be operable in accordance with Table 3.2.8.

4.2 SURVEILLANCE REQUIREMENTS

K. Degraded Grid Protective System

The emergency bus undervoltage instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.8.

Table 3.2.8 (page 1 of 1)
Degraded Grid Protective System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER BUS	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Degraded Bus Voltage				
a. Voltage	(a)	2	Note 1	≥ 3660 volts and ≤ 3740 volts
b. Time Delay	(a)	1	Note 2	≥ 9 seconds and ≤ 11 seconds
c. Voltage Alarm	(a)	2	Note 3	≥ 3660 volts and ≤ 3740 volts
d. Alarm Time Delay	(a)	1	Note 3	≥ 9 seconds and ≤ 11 seconds

(a) When the associated diesel generator is required to be operable.

Table 3.2.8 ACTION Notes

1. With one or more required Degraded Bus Voltage - Voltage Trip Function channels inoperable:

   a. Place any inoperable channel in trip within 1 hour.

   If the Action and associated completion time of Note 1.a are not met, immediately declare the associated diesel generator inoperable.

2. With one or more required Degraded Bus Voltage - Time Delay Trip Function channels inoperable:

   a. Restore any inoperable channel to operable status within 1 hour.

   If the Action and associated completion time of Note 2.a are not met, immediately declare the associated diesel generator inoperable.

3. With one or more required Degraded Bus Voltage - Voltage Alarm Trip Function channels inoperable, take all of the applicable Actions in Notes 3.a and 3.b:

   a. With one or more buses with alarm capability not maintained, restore alarm capability within 1 hour; and

   b. Restore any inoperable channel to operable status within 24 hours.

   If the Action and associated completion time of Note 3.a or 3.b are not met, initiate increased voltage monitoring of the associated 4.16kV emergency bus(es).

Table 4.2.8 (page 1 of 1)
Degraded Grid Protective System Instrumentation
Tests and Frequencies

TRIP FUNCTION	FUNCTIONAL TEST	CALIBRATION
1. Degraded Bus Voltage		
a. Voltage	(a)	Once/Operating Cycle
b. Time Delay	(a)	Once/Operating Cycle

(a) Separate Functional Tests are not required for this Trip Function. Trip Function operability is demonstrated during Trip Function Calibration and integrated ECCS tests performed once per Operating Cycle.

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Tab 1.K

RCIC System Actuation

3.2 LIMITING CONDITIONS FOR OPERATION

L. Reactor Core Isolation Cooling (RCIC) System Actuation

The RCIC System instrumentation for each Trip Function in Table 3.2.9 shall be operable in accordance with Table 3.2.9.

4.2 SURVEILLANCE REQUIREMENTS

L. Reactor Core Isolation Cooling (RCIC) System Actuation

1. The RCIC System instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.9.

   When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed as follows: (a) for up to 6 hours for Trip Function 3; and (b) for up to 6 hours for Trip Functions 1 and 2 provided the associated Trip Function maintains RCIC initiation capability.

2. Perform a Logic System Functional Test of RCIC System instrumentation Trip Functions once every Operating Cycle.

Table 3.2.9 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

TRIP FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE	TRIP SETTING
1. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]	4	Note 1	≥ 82.5 inches
2. Low Condensate Storage Tank Water Level	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]	2	Note 2	≥ 3.81%[b]
3. High Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]	2	Note 3	≤ 177.0 inches

(a) With reactor steam pressure > 150 psig.

(b) Percent of instrument span.

Table 3.2.9 ACTION Notes

1. With one or more RCIC System instrumentation Trip Function 1 channels inoperable:

   a. Declare the RCIC System inoperable within 1 hour from discovery of loss of RCIC initiation capability; and
   b. Place any inoperable channel in trip within 24 hours.

   If any applicable Action and associated completion time of Note 1.a or 1.b is not met, immediately declare the RCIC System inoperable.

2. With one or more RCIC System instrumentation Trip Function 2 channels inoperable:

   a. Declare the RCIC System inoperable within 1 hour from discovery of loss of RCIC initiation capability when RCIC System suction is aligned to the Condensate Storage Tank; and
   b. Place any inoperable channel in trip or align RCIC System suction to the suppression pool within 24 hours.

   If any applicable Action and associated completion time of Note 2.a or 2.b is not met, immediately declare the RCIC System inoperable.

3. With one or more RCIC System instrumentation Trip Function 3 channels inoperable:

   a. Restore any inoperable channel to operable status within 24 hours.

   If the Action and associated completion time of Note 3.a is not met, immediately declare the RCIC System inoperable.

Table 4.2.9 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation
Tests and Frequencies

TRIP FUNCTION	CHECK	FUNCTIONAL TEST	CALIBRATION
1. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
2. Low Condensate Storage Tank Water Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle
3. High Reactor Vessel Water Level	NA	Every 3 Months	Every 3 Months[a], Once/Operating Cycle

(a) Trip unit calibration only.

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Tab 1.L

Core and Containment Cooling Systems

3.5 LIMITING CONDITION FOR OPERATION

3. From and after the date that the Alternate Cooling Tower System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days, unless the Alternate Cooling Tower System is sooner made operable, provided that during such seven days, the Station Service Water System and both essential equipment cooling loops are operable.

4. If the requirements of Specification 3.5.D cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

E. High Pressure Cooling Injection (HPCI) System

1. Except as specified in Specification 3.5.E.2, whenever irradiated fuel is in the reactor vessel and reactor steam pressure is greater than 150 psig:

   a. The HPCI System shall be operable.

   b. The condensate storage tank shall contain at least 75,000 gallons of condensate water.

4.5 SURVEILLANCE REQUIREMENT

3. Deleted.

E. High Pressure Coolant Injection (HPCI) System

Surveillance of HPCI System shall be performed as follows:

1. Testing

   a. Deleted

   b. Operability testing of the pump and valves shall be in accordance with Specification 4.6.E.

   c. Upon reactor startup, HPCI operability testing shall be performed as required by Specification 4.6.E within 24 hours after exceeding 150 psig reactor steam pressure.

3.5 LIMITING CONDITION FOR OPERATION

due to malfunction of the electrical portion of the valve when the reactor is pressurized above 150 psig with irradiated fuel in the reactor vessel, continued reactor operation is permissible only during the succeeding seven days unless such a valve is sooner made operable, provided that during such seven days both the remaining Automatic Relief System valves and the HPCI System are operable.

3. If the requirements of Specification 3.5.F cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to ≤ 150 psig within 24 hours.

G. <u>Reactor Core Isolation Cooling System (RCIC)</u>

1. Except as specified in Specification 3.5.G.2 below, the RCIC System shall be operable whenever the reactor steam pressure is greater than 150 psig and irradiated fuel is in the reactor vessel.

2. From and after the date that the RCIC System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 14 days unless such system is sooner made operable, provided that:

   a. The HPCI System is immediately verified by administrative means to be operable, and

4.5 SURVEILLANCE REQUIREMENT

G. <u>Reactor Core Isolation Cooling System (RCIC)</u>

Surveillance of the RCIC System shall be performed as follows:

1. <u>Testing</u>

   a. Deleted

   b. Operability testing of the pump and valves shall be in accordance with Specification 4.6.E.

   c. Upon reactor startup, RCIC operability testing shall be performed as required by Specification 4.6.E within 24 hours after exceeding 150 psig reactor steam pressure.

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Tab 2

Revised Technical Specification Bases Pages

BVY 08-001
Docket No. 50-271
Attachment 1

Vermont Yankee Nuclear Power Station

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Revised Technical Specification Bases Pages

Tab 2.A

Fuel Cladding Safety Limits

BASES: 1.1 (Cont'd)

With no reactor coolant recirculation loops in operation, the plant must be brought to a condition in which the LCO does not apply. Operation of at least one reactor coolant recirculation loop provides core flow greater than natural circulation, so the margin to a critical power condition is significantly greater than this bounding example for all normal operating conditions with power less than the low power thermal limit. Therefore, a low power thermal limit of 23% rated thermal power is conservative.

Additionally, a core thermal power limit of 23% rated thermal power ensures consistency with the threshold for requiring thermal limit monitoring (i.e., average planar linear heat generation rate, linear heat generation rate, and minimum critical power ratio). This assures that for those power levels where thermal limit monitoring is required, the General Electric critical power correlation is applicable.

C. Power Transient

Plant safety analyses have shown that the scrams caused by exceeding any safety setting will assure that the Safety Limit of Specification 1.1A or 1.1B will not be exceeded. Scram times are checked periodically to assure the insertion times are adequate. The thermal power transient resulting when a scram is accomplished other than by the expected scram signal (e.g., scram from neutron flux following closure of the main turbine stop valves) does not necessarily cause fuel damage. However, for this specification a Safety Limit violation will be assumed when a scram is only accomplished by means of a backup feature of the plant design. The concept of not approaching a Safety Limit provided scram signals are operable is supported by the extensive plant safety analysis.

The computer provided with Vermont Yankee has a sequence annunciation program which will indicate the sequence in which events such as scram, APRM trip initiation, pressure scram initiation, etc. occur. This program also indicates when the scram setpoint is cleared. This will provide information on how long a scram condition exists and thus provide some measure of the energy added during a transient.

D. Reactor Water Level (Shutdown Condition)

During periods when the reactor is shutdown, consideration must also be given to water level requirements due to the effect of decay heat. If reactor water level should drop below the top of the enriched fuel during this time, the ability to cool the core is reduced. This reduction in core cooling capability could lead to elevated cladding temperatures and clad perforation. The core can be cooled sufficiently should the water level be reduced to two-thirds the core height. Establishment of the safety limit at 12 inches above the top of the enriched fuel provides adequate margin. This level will be continuously monitored.

BASES:

2.1 FUEL CLADDING INTEGRITY

A. Trip Settings

The bases for individual trip settings of Section 2.1 are discussed in the Bases for Specifications 3.1.A, 3.2.A and 3.2.B.

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Revised Technical Specification Bases Pages

Tab 2.B

Reactor Protection System

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

BACKGROUND

The Reactor Protection System (RPS) initiates a reactor scram when one or more monitored parameters exceed their specified limits, to preserve the integrity of the fuel cladding and the reactor coolant pressure boundary (RCPB) and minimize the energy that must be absorbed following a loss of coolant accident (LOCA). This can be accomplished either automatically or manually.

The protection and monitoring functions of the RPS have been designed to ensure safe operation of the reactor. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the RPS, as well as LCOs on other reactor system parameters and equipment performance. The LSSS are defined in this Specification as the Allowable Values, which, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits, including Safety Limits (SLs) during Design Basis Accidents (DBAs)and transients.

The RPS, as described in the UFSAR, Section 7.2 (Ref. 1), includes sensors, relays, bypass circuits, and switches that are necessary to cause initiation of a reactor scram. Functional diversity is provided by monitoring a wide range of dependent and independent parameters. The input parameters to the scram logic are from instrumentation that monitors reactor vessel water level, reactor vessel pressure, neutron flux, main steam line isolation valve position, turbine control valve (TCV) fast closure, turbine stop valve (TSV) position, drywell pressure, and scram discharge volume (SDV) water level, as well as reactor mode switch in shutdown position and manual scram signals. There are at least four redundant sensor input signals from each of these parameters (with the exception of the reactor mode switch in shutdown scram signal and the manual scram signal). Most channels include instrumentation that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs an RPS trip signal to the trip logic.

The RPS is comprised of two independent trip systems (A and B) with three logic channels in each trip system (logic channels A1, A2, and A3; B1, B2, and B3) as shown in Reference 1 figures. Logic channels A1, A2, B1, and B2 contain automatic logic for which the above monitored parameters each have at least one input to each of these logic channels. The outputs of the logic channels in a trip system are combined in a one-out-of-two logic so that either channel can trip the associated trip system. The tripping of both trip systems will produce a reactor scram. This logic arrangement is referred to as a one-out-of-two taken twice logic. In addition to the automatic logic channels, logic channels A3 and B3 (one logic channel per trip system) are manual scram channels. Both must be deenergized in order to initiate the manual trip function. Each trip system can be reset by use of a reset switch. If a full scram occurs (both trip systems trip), a relay prevents reset of the trip systems for 10 seconds after the full scram signal is received. This 10 second delay on reset ensures that the scram function will be completed.

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

BACKGROUND (continued)

One scram pilot valve with two scram valves are located in the hydraulic control unit for each control rod drive (CRD). Each scram pilot valve has two solenoids with the solenoids normally energized. The scram pilot valves control the air supply to the scram inlet and outlet valves for the associated CRD. When either scram pilot valve solenoid is energized, air pressure holds the scram valves closed and, therefore, both scram pilot valve solenoids must be de-energized to cause a control rod to scram. The scram valves control the supply and discharge paths for the CRD water during a scram. One of the scram pilot valve solenoids for each CRD is controlled by trip system A, and the other solenoid is controlled by trip system B. Any trip of trip system A in conjunction with any trip in trip system B results in de-energizing both solenoids, air bleeding off, scram valves opening, and control rod scram.

The backup scram valves, which energize on a scram signal to depressurize the scram air header, are also controlled by the RPS. Additionally, the RPS System controls the SDV vent and drain valves such that when both trip systems trip, the SDV vent and drain valves close to isolate the SDV.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The actions of the RPS are assumed in the safety analyses of References 1, 2, and 3. The RPS initiates a reactor scram when monitored parameter values exceed the trip values, specified by the setpoint methodology and listed in Table 3.1.1 to preserve the integrity of the fuel cladding, the RCPB, and the containment by minimizing the energy that must be absorbed following a LOCA.

RPS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Trip Functions not specifically credited in the accident analysis are retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

The operability of the RPS is dependent on the operability of the individual instrumentation channel Trip Functions specified in Table 3.1.1. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.1.1. As a result, for most Trip Functions, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. Since the APRM flow biased flux scram Trip Setting is an Allowable Value, it is only considered inoperable if its actual trip setpoint is not within the Trip Setting specified in Table 3.1.1 The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions. Each channel must also respond within its assumed response time, where applicable.

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The operability of scram pilot valves and associated solenoids, backup scram valves, and SDV valves, described in the Background section, are not addressed by this LCO.

The individual Trip Functions are required to be operable in the MODES or other specified conditions indicated in Table 3.1.1, which may require an RPS trip to mitigate the consequences of a design basis accident or transient. To ensure a reliable scram function, a combination of Trip Functions is required in each MODE to provide primary and diverse initiation signals.

The RPS is required to be operable in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, and in Refuel with reactor coolant temperature $\leq$ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies. Control rods withdrawn from a core cell containing no fuel assemblies do not affect the reactivity of the core and, therefore, are not required to have the capability to scram. Provided all other control rods remain inserted, the RPS function is not required. In this condition, the required Shutdown Margin and refuel position one-rod-out interlock ensure that no event requiring RPS will occur. During normal operation in HOT SHUTDOWN and COLD SHUTDOWN, all control rods are fully inserted and the Reactor Mode Switch Shutdown Position control rod withdrawal block does not allow any control rod to be withdrawn. Under these conditions, the RPS function is not required to be operable.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Reactor Mode Switch in Shutdown

The Reactor Mode Switch in Shutdown Trip Function provides signals, via the manual scram logic channels, to two RPS logic channels, which are redundant to the automatic protective instrumentation channels and provide manual reactor trip capability. This Trip Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

The reactor mode switch is a single switch with two channels, each of which provides input into one of the manual RPS logic channels (A3 and B3). The reactor mode switch is capable of scramming the reactor if the mode switch is placed in the shutdown position.

There is no Trip Setting for this Trip Function, since the channels are mechanically actuated based solely on reactor mode switch position.

Two channels of Reactor Mode Switch in Shutdown, with one channel in trip channel A3 and one channel in trip channel B3 are available and required to be operable. The Reactor Mode Switch in Shutdown Trip Function is required to be

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

operable in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, and in Refuel with reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

2. Manual Scram

The Manual Scram push button channels provide signals to the manual scram logic channels (A3 and B3), which are redundant to the automatic protective instrumentation channels and provide manual reactor trip capability. This Function was not specifically credited in the accident analysis but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

There is one Manual Scram push button channel for each RPS trip system. In order to cause a scram it is necessary for each trip system to be actuated.

There is no Trip Setting for this Trip Function since the channels are mechanically actuated based solely on the position of the push buttons.

Two channels of Manual Scram with one channel in trip channel A3 and one channel in trip channel B3 are available and required to be operable in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, and in Refuel with reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

3.a. Intermediate Range Monitor High Flux

The 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 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 IRMs provide diverse protection 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 IRMs provide mitigation of the neutron flux excursion. To demonstrate the capability of the IRM System to mitigate control rod withdrawal events, a generic analysis has been performed (Ref. 3) to evaluate the consequences of control rod withdrawal events during startup. This analysis, which assumes that one IRM channel in each trip system

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

is bypassed, demonstrates that the IRMs provide protection against local control rod withdrawal errors and results in peak fuel enthalpy below the 170 cal/gm fuel failure threshold criterion (Ref. 4).

The IRMs are also capable of limiting other reactivity excursions during startup, such as cold water injection events, although no credit is specifically assumed.

The IRM System is divided into two groups of IRM channels, with three IRM channels inputting to each trip system. The analysis of Reference 3 assumes that one channel in each trip system is bypassed. Therefore, four channels with two channels in each trip system are required for IRM operability to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal. This trip is active in each of the 10 ranges of the IRM, which must be selected by the operator to maintain the neutron flux within the monitored level of an IRM range.

The analysis of Reference 3 has adequate conservatism to permit the IRM Trip Setting of 120 divisions of a 125 division scale.

The Intermediate Range Monitor High Flux Trip Function must be operable during STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F when control rods may be withdrawn and the potential for criticality exists. In Refuel with reactor coolant temperature ≤ 212°F, when a cell with fuel has its control rod withdrawn, the IRMs provide monitoring for and protection against unexpected reactivity excursions. In RUN, the APRM System, the RWM, and the Rod Block Monitor provide protection against control rod withdrawal error events and the IRMs are not required.

3.b. Intermediate Range Monitor Inop

This trip signal provides assurance that a minimum number of IRMs are operable. Anytime an IRM mode switch is moved to any position other than "Operate," whenever 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 is bypassed. Since only one IRM 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.

This Trip Function was not specifically credited in the accident analysis but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

Four channels of Intermediate Range Monitor Inop 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 Trip Function on a valid signal.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Since this Trip Function is not assumed in the safety analysis, there is no Trip Setting for this Trip Function.

This Trip Function is required to be operable when the Intermediate Range Monitor High Flux Trip Function is required.

4.a. Average Power Range Monitor High Flux (Flow Bias)

The Average Power Range Monitor (APRM) channels receive input from the Local Power Range Monitors (LPRMs) within the reactor core, which provide indication of the power distribution and local power changes. The APRM channels average these LPRM signals to provide continuous indication of average reactor power from a few percent to greater than Rated Thermal Power. The Average Power Range Monitor High Flux (Flow Bias) Trip Function monitors neutron flux relative to the reactor coolant flow. The trip level is varied as a function of recirculation drive flow (i.e., at lower core flows, the setpoint is reduced proportional to the reduction in power experienced as core flow is reduced with a fixed control rod pattern) and is clamped at an upper limit. The relationship between recirculation drive flow and reactor core flow is non-linear at low core flows. Due to stability concerns, separate APRM flow biased scram trip setting equations are provided for low core flows. The flow bias portion of the Average Power Range Monitor High Flux (Flow Bias) Trip Function is not specifically credited in the accident or transient analyses, but is included to provide protection against transients where Thermal Power increases slowly and to provide protection against power oscillations which may result from reactor thermal hydraulic instabilities. However, the clamp portion of the Average Power Range Monitor High Flux (Flow Bias) Trip Function is assumed to terminate the main steam isolation valve closure event and along with the safety/relief valves (S/RVs) limits the RPV pressure to less than the ASME Code limits. The control rod drop accident (CRDA) analysis also takes credit for the clamp portion of this Trip Function to terminate the CRDA.

The APRM System is divided into two groups of channels with three APRM channels inputting into each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor High Flux (Flow Bias) with two channels in each trip system arranged in a one-out-of-two logic are required to be operable to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 13 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the levels at which the LPRMs are located, except that channels A, C, D and F may lose all APRM inputs from the companion APRM cabinet plus one additional LPRM input and still be considered operable. The LPRMs, themselves, do not provide a scram signal. Each APRM channel receives one total drive flow signal representative of total core flow. The total drive flow signals are generated by two flow converters, one

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

of which supplies signals to the trip system A APRMs, while the other supplies signals to the trip system B APRMs. Each flow converter signal is provided by summing up a flow signal from the two recirculation loops. Each required Average Power Range Monitor High Flux (Flow Bias) channel requires an input from one operable flow converter (e.g., if a converter unit is inoperable, the associated Average Power Range Monitor High Flux (Flow Bias) channels must be considered inoperable). An APRM flow converter is considered inoperable whenever it cannot deliver a flow signal less than or equal to actual recirculation flow conditions for all steady state and transient reactor conditions while in RUN.

The APRM flow biased flux scram Trip Setting is an Allowable Value, which is the limiting value that the trip setpoint may have when tested periodically, beyond which appropriate action shall be taken. For Vermont Yankee, the periodic testing is defined as the calibration. The actual scram trip is conservatively set in relation to the Allowable Value to ensure operability between periodic testing. The Trip Setting is derived from the Analytical Limit assumed in the CRDA analyses. W is percent of rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 X 10^6 lbs/hr core flow.

The Average Power Range Monitor High Flux (Flow Bias) Trip Function is required to be operable in RUN where there is a possibility of generating excessive Thermal Power and potentially exceeding the SL applicable to high pressure and core flow conditions (SL 1.1.A) and where there is the possibility of neutronic/thermal hydraulic instability. During STARTUP/HOT STANDBY and Refuel, other IRM and APRM Trip Functions provide protection for fuel cladding integrity. Although the Average Power Range Monitor High Flux (Flow Bias) Trip Function is assumed in the CRDA analysis, which is applicable in STARTUP/HOT STANDBY, the Average Power Range Monitor High Flux (Reduced) Trip Function conservatively bounds the assumed trip and, together with the assumed IRM trips, provides adequate protection. Therefore, the Average Power Range Monitor High Flux (Flow Bias) Trip Function is not required in STARTUP/HOT STANDBY.

4.b. Average Power Range Monitor High Flux (Reduced)

The APRM channels receive input signals from the LPRMs within the reactor core, which provide an indication of the power distribution and local power changes. The APRM channels average these LPRM signals to provide a continuous indication of average reactor power from a few percent to greater than Rated Thermal Power. For operation at low power (i.e., STARTUP/HOT STANDBY), the Average Power Range Monitor High Flux (Reduced) Trip Function is capable of generating a trip signal that prevents fuel damage resulting from abnormal operating transients in this power range. For most operation at low power levels, the Average Power Range Monitor High Flux (Reduced) Trip Function will provide a secondary scram to the Intermediate Range Monitor High Flux Trip Function because of the relative setpoints. With the IRMs at Range 9 or 10, it is possible that the Average Power Range Monitor High Flux (Reduced) Trip

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Function will provide the primary trip signal for a core-wide increase in power.

No specific safety analyses take direct credit for the Average Power Range Monitor High Flux (Reduced) Trip Function. However, the Average Power Range Monitor High Flux (Reduced) Trip Function indirectly ensures that before the reactor mode switch is placed in the run position, reactor power does not exceed 23% RTP (SL 1.1.B) when operating at low reactor pressure and low core flow. Therefore, it indirectly prevents fuel damage during significant reactivity increases with reactor power < 23% Rated Thermal Power.

The APRM System is divided into two groups of channels with three APRM channel inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor High Flux (Reduced) with two channels in each trip system are required to be operable to ensure that no single failure will preclude a scram from this Trip Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 13 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the levels at which the LPRMs are located, except that channels A, C, D and F may lose all APRM inputs from the companion APRM cabinet plus one additional LPRM input and still be considered operable. The LPRMs, themselves, do not provide a scram signal.

The Trip Setting is based on preventing significant increases in power when reactor power is < 23% Rated Thermal Power.

The Average Power Range Monitor High Flux (Reduced) Trip Function must be operable during STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F when control rods may be withdrawn since the potential for criticality exists. In RUN, the Average Power Range Monitor High Flux (Flow Bias) Trip Functions provide protection against reactivity transients and the RWM and Rod Block Monitor protect against control rod withdrawal error events.

4.c. Average Power Range Monitor Inop

This signal provides assurance that a minimum number of APRMs are operable. Anytime an APRM mode switch is moved to any position other than "Operate," an APRM module is unplugged, or the APRM has too few LPRM inputs (< 13 for channels B and E; < 9 for channels A, C, D and F), an inoperative trip signal will be received by the RPS, unless the APRM is bypassed. Since only one APRM in each trip system may be bypassed, only one APRM in each trip system may be inoperable without resulting in an RPS trip signal. This Trip Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Four channels of Average Power Range Monitor Inop with two channels in each trip system are required to be operable to ensure that no single failure will preclude a scram from this Trip Function on a valid signal.

There is no Trip Setting for this Trip Function.

This Trip Function is required to be operable in the MODES where the APRM Trip Functions are required.

5. High Reactor Pressure

An increase in RPV pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This causes the neutron flux and Thermal Power transferred to the reactor coolant to increase, which could challenge the integrity of the fuel cladding and the RCPB. The High Reactor Pressure Trip Function initiates a scram for transients that result in a pressure increase, counteracting the pressure increase by rapidly reducing core power. For the overpressurization protection analyses of Reference 5, reactor scram (the analyses conservatively assume scram from the APRM High Flux (Flow Bias) signal, not the High Reactor Pressure signal), along with the S/RVs, limits the peak RPV pressure to less than the ASME Section III Code limits.

High reactor pressure signals are initiated from four pressure transmitters that sense reactor pressure. The High Reactor Pressure Trip Setting is chosen to provide a sufficient margin to the ASME Section III Code limits during the event.

Four channels of High Reactor Pressure Trip Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal. The Function is required to be operable in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F since the Reactor Coolant System (RCS) is pressurized and the potential for pressure increase exists.

6. High Drywell Pressure

High pressure in the drywell could indicate a break in the RCPB. A reactor scram is initiated to minimize the possibility of fuel damage and to reduce the amount of energy being added to the coolant and the drywell. The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the ECCS, ensures that the requirements of 10 CFR 50.46 are met.

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Trip Setting was selected to be as low as possible and indicative of a LOCA inside primary containment.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Four channels of High Drywell Pressure, with two channels in each trip system arranged in a one-out-of-two logic, are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal. The Trip Function is required in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, where considerable energy exists in the RCS, resulting in the limiting transients and accidents.

7. Reactor Low Water Level

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, a reactor scram is initiated at low water level to substantially reduce the heat generated in the fuel from fission. The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the Emergency Core Cooling Systems (ECCS), ensures that requirements of 10 CFR 50.46 are met.

Reactor Low Water Level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

Four channels of Reactor Low Water Level Trip Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal.

The Reactor Low Water Level Trip Setting is selected to ensure that during normal operation spurious scrams are avoided and that enough water is available above the top of enriched fuel to account for evaporative losses and displacements of coolant following the most severe abnormal operational transient involving a reactor water level decrease. The Trip Setting is referenced from top of enriched fuel. The top of enriched fuel has been designated as 0 inches and provides a common reference point for all reactor vessel water level instrumentation.

The Trip Function is required in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F where considerable energy exists in the RCS resulting in the limiting transients and accidents. ECCS initiations at low water levels provide sufficient protection for level transients in all other MODES.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

8. Scram Discharge Volume High Level

The SDV receives the water displaced by the motion of the CRD pistons during a reactor scram. Should this volume fill to a point where there is insufficient volume to accept the displaced water, control rod insertion would be hindered. Therefore, a reactor scram is initiated while the remaining free volume is still sufficient to accommodate the water from a full core scram. No credit is taken for a scram initiated from these Trip Functions for any of the design basis accidents or transients analyzed in the UFSAR. However, they are retained to ensure the RPS remains operable.

There are four level transmitters and trip units associated with each instrument volume. Four trip units (two for each instrument volume) are provided for each RPS trip system. On a per instrument volume basis, these trip units are arranged in pairs so that no single event will prevent a scram from this Trip Function on a valid signal.

The Trip Setting is chosen low enough to ensure that there is sufficient volume in the SDVs to accommodate the water from a full scram.

Eight channels of the Scram Discharge Volume High Level Trip Function, with two channels per volume in each trip system, are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal. These Trip Functions are required in RUN, STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, and in Refuel with reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn. At all other times, this Trip Function may be bypassed.

9. Main Steamline Isolation Valve Closure

Main steamline isolation valve (MSIV) closure results in loss of the main turbine and the condenser as a heat sink for the nuclear steam supply system and indicates a need to shut down the reactor to reduce heat generation. Therefore, a reactor scram is initiated on a Main Steamline Isolation Valve Closure signal before the MSIVs are completely closed in anticipation of the complete loss of the normal heat sink and subsequent overpressurization transient. However, for the overpressurization protection analyses of Reference 5, the Average Power Range Monitor High Flux (Flow Bias) Trip Function, along with the S/RVs, limits the peak RPV pressure to less than the ASME Code limits. That is, the direct scram on position switches for MSIV closure events is not assumed in the overpressurization analysis.

The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the ECCS, ensures that the requirements of 10 CFR 50.46 are met.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

MSIV closure signals are initiated from position switches located on each of the eight MSIVs. Each MSIV has two position switches; one switch inputs to RPS trip system A while the other switch inputs to RPS trip system B. Thus, each RPS trip system receives an input from eight Main Steamline Isolation Valve Closure channels, each consisting of one position switch. The logic for the Main Steam Isolation Valve Closure Trip Function is arranged such that either the inboard or outboard valve on three or more of the main steam lines must close in order for a scram to occur. In addition, certain combinations of valves closed in two lines will result in a half-scram.

The Main Steam Isolation Valve Closure Trip Setting is specified to ensure that a scram occurs prior to a significant reduction in steam flow, thereby reducing the severity of the subsequent pressure transient.

Sixteen channels of the Main Steam Isolation Valve Closure Trip Function, with eight channels in each trip system, are required to be operable to ensure that no single instrument failure will preclude the scram from this Trip Function on a valid signal. This Trip Function is only required in RUN since, with the MSIVs open and the heat generation rate high, a pressurization transient can occur if the MSIVs close. In STARTUP/HOT STANDBY and Refuel with reactor coolant temperature > 212°F, the heat generation rate is low enough so that the other diverse RPS functions provide sufficient protection.

10. Turbine Control Valve Fast Closure

Fast closure of the TCVs results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated on TCV fast closure in anticipation of the transients that would result from the closure of these valves. The Turbine Control Valve Fast Closure Trip Function is the primary scram signal for the generator load rejection event analyzed in Reference 6. For this event, the reactor scram reduces the amount of energy required to be absorbed and ensures that the MCPR SL (SL 1.1.A) is not exceeded.

Turbine Control Valve Fast Closure signals are initiated by the four pressure switches that sense acceleration relay oil pressure. Each pressure switch provides a signal to a separate RPS logic channel. This Trip Function must be enabled at Thermal Power > 25% Rated Thermal Power. This is accomplished automatically by pressure switches sensing turbine first stage pressure; therefore, opening of the turbine bypass valves may affect this Trip Function.

The Turbine Control Valve Fast Closure Trip Setting is selected to detect imminent TCV fast closure.

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Four channels of Turbine Control Valve Fast Closure with two channels in each trip system arranged in a one-out-of-two logic are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal. This Trip Function is required, consistent with the analysis assumptions, whenever Thermal Power is > 25% Rated Thermal Power. This Trip Function is not required when Thermal Power is ≤ 25% Rated Thermal Power, since the High Reactor Pressure and the Average Power Range Monitor High Flux (Flow Bias) Trip Functions are adequate to maintain the necessary safety margins.

11. Turbine Stop Valve Closure

Closure of the TSVs results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated at the start of TSV closure in anticipation of the transients that would result from the closure of these valves. The Turbine Stop Valve Closure Trip Function is the primary scram signal for the turbine trip event analyzed in Reference 7. For this event, the reactor scram reduces the amount of energy required to be absorbed and ensures that the MCPR SL (SL 1.1.A) is not exceeded.

Turbine Stop Valve Closure signals are initiated from limit switches located on each of the four TSVs. Each TSV has one limit switch with two contacts; one contact inputs to RPS trip system A; the other contact inputs to RPS trip system B. Thus, each RPS trip system receives an input from four Turbine Stop Valve Closure channels, each consisting of one limit switch contact. The logic for the Turbine Stop Valve Closure Trip Function is such that three or more TSVs must be closed to produce a scram. In addition, certain combinations of two valves closed will result in a half-scram. This Function must be enabled at Thermal Power > 25% Rated Thermal Power. This is accomplished automatically by pressure switches sensing turbine first stage pressure; therefore, opening of the turbine bypass valves may affect this Trip Function.

The Turbine Stop Valve Closure Trip Setting is selected to be high enough to detect imminent TSV closure, thereby reducing the severity of the subsequent pressure transient.

Eight channels of Turbine Stop Valve Closure, with four channels in each trip system, are required to be operable to ensure that no single instrument failure will preclude a scram from this Trip Function on a valid signal if any three TSVs should close. This Trip Function is required, consistent with analysis assumptions, whenever Thermal Power is > 25% Rated Thermal Power. This Trip Function is not required when Thermal Power is ≤ 25% Rated Thermal Power, since the High Reactor Pressure and the Average Power Range Monitor High Flux (Flow Bias) Trip Functions are adequate to maintain the necessary safety margins.

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ACTIONS

Table 3.1.1 ACTION Notes 1.a.1) and 1.a.2)

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Ref. 8) to permit restoration of any inoperable channel to operable status. However, this out of service time is only acceptable provided the associated Trip Function's inoperable channels are in only one trip system and the Trip Function still maintains RPS trip capability (refer to Bases for Table 3.1.1 ACTION Notes 1.b.1), 1.b.2), and 1.c.1)). If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Table 3.1.1 ACTION Note 1.a.1) or 1.a.2). Placing the inoperable channel in trip (or the associated trip system in trip) would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternatively, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a full scram), the applicable action of Table 3.1.1 ACTION Note 2 must be taken.

Table 3.1.1 ACTION Notes 1.b.1) and 1.b.2)

Table 3.1.1 ACTION Notes 1.b.1) and 1.b.2) apply when, for any one or more Trip Functions, at least one required channel is inoperable in each trip system. In this condition, provided at least one channel per trip system is operable, the RPS still maintains trip capability for that Function, but cannot accommodate a single failure in either trip system.

Table 3.1.1 ACTION Notes 1.b.1) and 1.b.2) limit the time the RPS scram logic, for any Trip Function, would not accommodate single failure in both trip systems (e.g., one-out-of-one and one-out-of-one arrangement for a typical four channel Trip Function). The reduced reliability of this logic arrangement was not evaluated in Reference 8 for the 12 hour Completion Time. Within the 6 hour allowance, the associated Trip Function will have all required channels operable or in trip (or any combination) in one trip system. This is accomplished by either placing all inoperable channels in trip or tripping the trip system.

Completing one of these Actions (either Table 3.1.1 ACTION Note 1.b.1) or 1.b.2)) restores RPS to a reliability level equivalent to that evaluated in Reference 8, which justified a 12 hour allowable out of service time as presented in Table 3.1.1 ACTION Note 1.a.1) and 1.a.2). The trip system in the more degraded state should be placed in trip or, alternatively, all the inoperable channels in that trip system should be placed in trip (e.g., a trip system with two inoperable channels could be in a more degraded state than a trip system with four inoperable channels if the two inoperable channels are in the same Trip Function while the four inoperable channels are all in

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

ACTIONS (continued)

different Trip Functions). The decision of which trip system is in the more degraded state should be based on prudent judgment and take into account current plant conditions (i.e., what Mode the plant is in). If this action would result in a scram, it is permissible to place the other trip system or its inoperable channels in trip.

The 6 hour Completion Time is judged acceptable based on the remaining capability to trip, the diversity of the sensors available to provide the trip signals, the low probability of extensive numbers of inoperabilities affecting all diverse Trip Functions, and the low probability of an event requiring the initiation of a scram.

Alternately, if it is not desired to place the inoperable channels (or one trip system) in trip (e.g., as in the case where placing the inoperable channel or associated trip system in trip would result in a scram, the applicable actions of Table 3.1.1 ACTION Note 2 must be taken.

Table 3.1.1 ACTION Note 1.c.1)

Table 3.1.1 ACTION Note 1.c.1) is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same trip system for the same Trip Function result in the Trip Function not maintaining RPS trip capability. A Trip Function is considered to be maintaining RPS trip capability when sufficient channels are operable or in trip (or the associated trip system is in trip), such that both trip systems will generate a trip signal from the given Trip Function on a valid signal. For the typical Trip Function with one-out-of-two taken twice logic and the IRM and APRM Functions, this would require both trip systems to have one channel operable or in trip (or the associated trip system in trip). For Trip Function 1 (Reactor Mode Switch in Shutdown) and Trip Function 2 (Manual Scram), this would require both trip systems to have one channel, each operable or in trip (or the associated trip system in trip). For Trip Function 8 (Scram Discharge Volume High Level), this would require both trip systems to have one channel per instrument volume operable or in trip (or the associated trip system in trip). For Trip Function 9 (Main Steamline Isolation Valve Closure), this would require both trip systems to have each channel associated with the MSIVs in three main steam lines (not necessarily the same main steam lines for both trip systems) operable or in trip (or the associated trip system in trip). For Trip Function 11 (Turbine Stop Valve Closure), this would require both trip systems to have three channels, each operable or in trip (or the associated trip system in trip).

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

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ACTIONS (continued)

Table 3.1.1 ACTION Notes 2.a, 2.b, 2.c and 2.d

If any applicable Action and associated completion time of Table 3.1.1 ACTION Note 1.a, 1.b, or 1.c are not met, the applicable Actions of Table 3.1.1 ACTION Note 2 and referenced in Table 3.1.1 (as identified for each Trip Function in the Table 3.1.1 "ACTIONS REFERENCED FROM ACTION NOTE 1" column) must be immediately entered and taken. The applicable Action specified in Table 3.1.1 is Trip Function and Mode or other specified condition dependent.

For Table 3.1.1 ACTION Note 2.a, 2.b, or 2.c, if the applicable channel(s) is not restored to operable status or placed in trip (or the associated trip system placed in trip) within the allowed completion time, the plant must be placed in a Mode or other specified condition in which the LCO does not apply. The allowed completion times are reasonable, based on operating experience, to reach the specified condition from full power conditions in an orderly manner and without challenging plant systems.

For Table 3.1.1 ACTION Note 2.d, if the applicable channel(s) is not restored to operable status or placed in trip (or the associated trip system placed in trip) within the allowed completion time, the plant must be placed in a Mode or other specified condition in which the LCO does not apply. This is done by immediately initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and are, therefore, not required to be inserted. Action must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.1.A.1

As indicated in Surveillance Requirement 4.1.A.1, RPS instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.1.1. Table 4.1.1 identifies, for each RPS Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.1.A.1 also indicates that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours, provided the associated Trip Function maintains RPS trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

SURVEILLANCE REQUIREMENTS (continued)

analysis (Ref. 8) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

Surveillance Requirement 4.1.A.2, Automatic Scram Contactor Functional Test

There are four pairs of RPS automatic scram contactors with each pair associated with an RPS scram test switch. Each pair of scram contactors is associated with an automatic scram logic channel (A1, A2, B1, and B2). Using the RPS channel test switches, the automatic scram contactors can be exercised without the necessity of using a scram function trip. However, a Functional Test of any automatic RPS Trip Function may be used to satisfy the requirement to exercise the RPS automatic scram contactors. Surveillance Frequency extensions for RPS Functions, described in Reference 8, are allowed provided the automatic scram contactors are exercised weekly. This Surveillance may be accomplished by placing the associated RPS scram test switch in the trip position, which will deenergize a pair of RPS automatic scram contactors thereby tripping the associated RPS logic channel.

The RPS scram test switches were not specifically credited in the accident analysis. However, because the Manual Scram Trip Functions at the Vermont Yankee Nuclear Power Station (VYNPS) were not configured the same as the generic model in Reference 8, the RPS scram test switches were evaluated and it was concluded that the Frequency extensions for RPS Trip Functions are not affected by the difference in RPS configuration since each automatic RPS channel has a test switch which is functionally the same as the manual scram switches in the generic model. As such, exercising each automatic scram contactor is required to be performed every 7 days. The Frequency of 7 days is based on the reliability analysis of Reference 8 as modified by the VYNPS design specific RPS evaluation.

Surveillance Requirement 4.1.A.3, RPS Response Time Test

This Surveillance Requirement ensures that the individual channel response times are less than or equal to 50 milliseconds. This test may be performed in one measurement or in overlapping segments, with verification that all required components are tested. The "Once every Operating Cycle" Frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

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SURVEILLANCE REQUIREMENTS (continued)

Surveillance Requirement 4.1.A.4

The Logic System Functional Test demonstrates the operability of the required initiation logic and simulated automatic operation for a specific channel. The testing required by the Control Rod System Technical Specifications overlaps this Surveillance to provide testing of the assumed safety function. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.1.1, Check

Performance of an Instrument Check once per day for Trip Functions 3.a, 5, and 7, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Footnote (a) of Table 4.1.1 provides requirements to verify overlap for Trip Functions 3.a and 4.b to ensure that no gaps in neutron flux indication exist from subcritical to power operation for monitoring core reactivity status. The overlap between SRMs and IRMs is required to be demonstrated to ensure that reactor power will not be increased into a neutron flux region without adequate indication. This is required prior to withdrawing SRMs from the fully inserted position since indication is being transitioned from the SRMs to the IRMs. The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (by initiating a rod block) if adequate overlap is not maintained. Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between RUN and STARTUP/HOT STANDBY can be made without either APRM downscale rod block, or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when,

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SURVEILLANCE REQUIREMENTS (continued)

prior to withdrawing the SRMs from the fully inserted position, IRMs are above mid-scale on range 1 before SRMs have reached the upscale rod block. As noted, IRM/APRM overlap is only required to be met during entry into STARTUP/HOT STANDBY from RUN. That is, after the overlap requirement has been met and indication has transitioned to the IRMs, maintaining overlap is not required (APRMs may be reading downscale once in STARTUP/HOT STANDBY). If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channel(s) declared inoperable. Only those appropriate channels that are required in the current MODE or condition should be declared inoperable. A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.

Table 4.1.1, Functional Test

A Functional Test is performed on each required channel to ensure that the channel will perform the intended function. For Trip Function 1, this Surveillance is performed by placing the reactor mode switch in the shutdown position. For Trip Functions 2, 3.a, 3.b, 5, 6, 7, 8, 9, 10, 10.a, 11, and 11.a, this Surveillance verifies the trip of the required channel. For Trip Functions 4.a, 4.b, and 4.c, this Surveillance verifies the trip of the required output relay. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

For Trip Functions 3.a, 3.b, and 4.b, as noted (Table 4.1.1 Footnote (b)), the Functional Test is not required to be completed when entering STARTUP/HOT STANDBY from RUN, since testing of the STARTUP/HOT STANDBY required IRM and APRM Trip Functions cannot be performed in RUN without utilizing jumpers, lifted leads, or movable links. This allows entry into STARTUP/HOT STANDBY if the required Frequency is not met. In this event, the Surveillance must be completed within 12 hours after entering STARTUP/HOT STANDBY from RUN. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the Surveillance.

For Trip Function 4.b, a Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval.

For Trip Functions 3.a and 3.b, the Frequency of 31 days is based on the safety assessment described in Reference 9.

For Trip Functions 2, 4.a, 4.c, 5, 6, 7, 8, 9, 10, and 11, the Frequency of "Every 3 Months" is based on the reliability analysis of Reference 8.

For Trip Functions 10.a and 11.a, the Frequency of "Every 6 Months" is based in engineering judgment and reliability of the components.

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

SURVEILLANCE REQUIREMENTS (continued)

For Trip Function 1, The Frequency of "Each Refueling Outage" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.1.1, Calibration

For Trip Function 4.a, to ensure that the APRMs are accurately indicating the true core average power, the APRMs are adjusted to conform to the reactor power calculated from a heat balance. The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading between performances of APRM adjustments (per heat balance). Footnote (d) to Table 4.1.1 requires this heat balance Surveillance to be performed only at ≥ 25% Rated Thermal Power because it is difficult to accurately maintain APRM indication of core Thermal Power consistent with a heat balance when < 25% Rated Thermal Power. At low power levels, a high degree of accuracy is unnecessary because of the large, inherent margin to thermal limits (MCPR and APLHGR). At ≥ 25% Rated Thermal Power, the Surveillance is required to have been satisfactorily performed within the last 7 days. Footnote (d) is provided which allows an increase in Thermal Power above 25% if the 7 day Frequency is not met. In this event, the Surveillance must be performed within 12 hours after reaching or exceeding 25% Rated Thermal Power. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the Surveillance.

For Trip Function 4.a, 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 2000 mega-watt 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 uncertainties, remains less than the total uncertainty (i.e., 8.7%) allowed by the GETAB safety limit analysis.

For Trip Functions 3.a, 4.a, 4.b, 5, 6, 7, 8, 9, 10, 10.a, 11, and 11.a, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The Instrument Calibration for Functions 9 and 11 should consist of a physical inspection and actuation of the associated position switches. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

SURVEILLANCE REQUIREMENTS (continued)

For Trip Functions 4.a, 5, 6, 7, and 8, a calibration of the trip units is required (Footnote (e)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. Trip function 4.b receives trip unit calibration (Footnote(e)) on a ≤ 7 Day Frequency during Refueling, before entering STARTUP/HOT STANDBY, and during STARTUP/HOT STANDBY. For Trip Functions 4.b,5,6,7, and 8, the channel must be declared inoperable if the trip setpoint is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The calibration of Trip Function 4.a, the APRM High Flux Flow Bias Scram, trip units provides a check of the actual trip setpoints. If the trip setting is found to be less conservative than accounted for in the appropriate setpoint calculation, but is not beyond the Allowable Value specified in Table 3.1.1, the channel performance is still within the requirements of the plant safety analysis. However, if the trip setting is found to be less conservative than the Allowable Value specified in Table 3.1.1, the channel should be declared inoperable. Under these conditions, the setpoint should be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint calculation. The Frequency of every 3 months is based on the reliability analysis of Reference 8 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

Footnote (b) to Table 4.1.1 is provided to require the APRM and IRM Surveillances to be completed within 12 hours of entering STARTUP/HOT STANDBY from RUN. Testing of the STARTUP/HOT STANDBY APRM and IRM Trip Functions cannot be performed in RUN without utilizing jumpers, lifted leads, or movable links. This Footnote allows entry into STARTUP/HOT STANDBY from RUN if the associated Frequency is not met. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the Surveillance. Footnote (c) to Table 4.1.1 states that neutron detectors are excluded from Instrument Calibration because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in LPRM neutron detector sensitivity are compensated for by performing the 7 day heat balance calibration and the 2000 MWD/T LPRM calibration against the TIP System.

BASES: 3.1.A/4.1.A REACTOR PROTECTION SYSTEM

REFERENCES

1. UFSAR, Section 7.2.

2. UFSAR, Chapter 14.

3. NEDO-23842, Continuous Control Rod Withdrawal in the Startup Range, April 18, 1978.

4. UFSAR, Section 14.5.3.

5. UFSAR, Section 14.5.1.3.1

6. UFSAR, Section 14.5.1.1.

7. UFSAR, Section 14.5.1.2.

8. NEDC-30851-P-A, Technical Specification Improvement Analyses for BWR Reactor Protection System, March 1988.

9. Safety Evaluation by the Office of Nuclear Reactor Regulation related to Amendment No. 225 to Facility Operating License No. DPR-28, Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations Inc., Vermont Yankee Nuclear Power Station, Docket No. 50-271, dated July 7, 2005.

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Tab 2.C

ECCS System

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

BACKGROUND

The purpose of the ECCS instrumentation is to initiate appropriate responses from the ECCS to ensure that the fuel is adequately cooled in the event of a design basis accident or transient.

For most abnormal operational transients and Design Basis Accidents (DBAs), a wide range of dependent and independent parameters are monitored.

The ECCS instrumentation actuates core spray (CS), the low pressure coolant injection (LPCI) mode of the Residual Heat Removal (RHR) System, high pressure coolant injection (HPCI), Automatic Depressurization System (ADS), and the diesel generators (DGs). The equipment involved with each of these systems is described in Bases 3.5, "Core and Containment Cooling Systems," and in Bases 3.10, "Auxiliary Electrical Power Systems."

Core Spray System

The CS System consists of two subsystems (A and B). Subsystem A is identical in function to subsystem B. Automatic initiation occurs for conditions of Low - Low Reactor Vessel Water Level and Low Reactor Pressure (Initiation) or High Drywell Pressure. The Low - Low Reactor Vessel Water Level and High Drywell Pressure diverse variables are each monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic (i.e., two trip systems) for each Trip Function. The Low Reactor Pressure (Initiation) signals are initiated from two pressure transmitters that sense reactor pressure. Each pressure transmitter provides an input to both CS trip systems with the contacts arranged in a one-out-of-two logic.

Upon receipt of an initiation signal, if normal AC power is available, both CS pumps start. If an initiation signal is received when normal AC power is not available, the CS pumps are started approximately 9 seconds after power is available to limit the loading of the AC power sources.

The CS test line isolation valve, which is also a primary containment isolation valve (PCIV), is closed on a CS initiation signal to allow full system flow assumed in the accident analyses and maintain primary containment isolated in the event CS is not operating.

The CS System also monitors the pressure in the reactor to ensure that, before the injection valves open, the reactor pressure has fallen to a value below the CS System's maximum design pressure. The variable is monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic.

The status of the normal and emergency AC power supplies necessary for pump operation is also monitored. This ensures that load sequencing occurs

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

BACKGROUND (continued)

if normal AC power is not available. These parameters are monitored by relays (Auxiliary Power Monitors and Pump Bus Power Monitors) whose outputs are arranged in a one-out-of-one logic and a one-out-of-two logic, respectively.

Low Pressure Coolant Injection System

The LPCI is an operating mode of the Residual Heat Removal (RHR) System, with two LPCI subsystems (A and B). Subsystem A is identical in function to subsystem B. Automatic initiation occurs for conditions of Low - Low Reactor Vessel Water Level concurrent with Low Reactor Pressure (Initiation) or High Drywell Pressure (Initiation). Each of these diverse variables, except Low Reactor Pressure (Initiation) is monitored by four redundant transmitters, which, in turn, are connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic (i.e., two trip systems) for each Trip Function. The High Drywell Pressure signals are also used for the containment spray permissive. The Low Reactor Pressure (Initiation) signals are initiated from two pressure transmitters that sense reactor pressure. Each of these pressure transmitters provides an input to both low pressure ECCS logic trains with the contacts arranged in one-out-of-two logic. Once an initiation signal is received by the LPCI control circuitry, the signal is sealed in until manually reset.

Upon receipt of an initiation signal, if normal AC power is available, the LPCI pumps are started with no time delay. If normal AC power is not available, LPCI pumps A and D start immediately once power is available and LPCI pumps B and C are started approximately 4 seconds after power is available to limit the loading of the AC standby power sources.

The RHR containment cooling return line valves, torus spray isolation valves, and drywell spray isolation valves (which are also PCIVs) are also closed on a LPCI initiation signal to allow the full system flow assumed in the accident analyses and maintain primary containment isolated in the event LPCI is not operating.

The LPCI System monitors the pressure in the reactor to ensure that, before an injection valve opens, the reactor pressure has fallen to a value below the LPCI System's maximum design pressure. The variable is monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic.

Additionally, instruments (i.e., reactor water level and reactor pressure) are provided to close the recirculation loop pump discharge valves to ensure that LPCI flow does not bypass the core when it injects into the recirculation lines. The variable is monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

BACKGROUND (continued)

Low reactor water level in the shroud is detected by two additional instruments. When level is greater that the trip setting of the LPCI Reactor Vessel Shroud Level Trip Function, LPCI may no longer be required, therefore, other modes of RHR (e.g., suppression pool cooling) are allowed. Manual overrides for the isolations, when water level is below the associated trip setting, are provided.

The status of the normal and emergency AC power supplies necessary for pump operation is also monitored. This ensures that load sequencing occurs if normal AC power is not available. These parameters are monitored by relays (Auxiliary Power Monitors and Pump Bus Power Monitors) whose outputs are arranged in a one-out-of-one logic and a one-out-of-two logic, respectively.

High Pressure Coolant Injection System

Automatic initiation of the HPCI System occurs for conditions of Low - Low Reactor Vessel Water Level or High Drywell Pressure. Each of these variables is monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic for each Trip Function.

The HPCI test line isolation valves are closed upon receipt of a HPCI initiation signal to allow the full system flow assumed in the accident analysis.

The HPCI System also monitors the water level in the condensate storage tank (CST). Reactor grade water in the CST is the normal source. Upon receipt of a HPCI initiation signal, the CST suction valve is automatically signaled to open. If the water level in the CST falls below a preselected level, first the suppression pool suction valves automatically open. When the suppression pool suction valves start to open, the CST suction valve automatically closes. Two level transmitters are used to detect low water level in the CST. Either transmitter can cause the suppression pool suction valves to open and the CST suction valve to close.

The HPCI System provides makeup water to the reactor until the reactor vessel water level reaches the High Reactor Vessel Water Level trip, at which time the HPCI turbine trips, which causes the turbine's stop valve to close. This variable is monitored by two transmitters, which are, in turn, connected to two trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a two-out-of-two logic to provide high reliability of the HPCI System. The HPCI System automatically restarts if a Low - Low Reactor Vessel Water Level signal is subsequently received.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

BACKGROUND (continued)

Automatic Depressurization System

Automatic initiation of the ADS occurs when signals indicating Low - Low Reactor Vessel Water Level; High Drywell Pressure, or sustained Low - Low Reactor Vessel Water Level; and CS or RHR (LPCI Mode) High Pump Discharge Pressure are all present and the ADS Time Delay has timed out. There are two transmitters for Low - Low Reactor Vessel Water Level and High Drywell Pressure in each of the two ADS trip system logics. Each of these transmitters connects to a trip unit, which then drives a relay whose contacts form the initiation logic.

Each ADS trip system logic includes a time delay between satisfying the initiation logic and the actuation of the ADS valves. The ADS Time Delay setpoint chosen is long enough that the HPCI System has sufficient operating time to recover to a level above Low - Low Reactor Vessel Water Level, yet not so long that the LPCI and CS Systems are unable to adequately cool the fuel if the HPCI System fails to maintain that level. An alarm in the control room is annunciated when either of the timers is timing. Resetting the ADS initiation signals resets the ADS Time Delay.

The ADS also monitors the discharge pressures of the four LPCI pumps and the two CS pumps. Each ADS trip system includes two discharge pressure permissive switches from one CS pump and from each LPCI pump. The signals are used as a permissive for ADS actuation, indicating that there is a source of core coolant available once the ADS has depressurized the vessel. Any one of the six low pressure pumps is sufficient to permit automatic depressurization.

The ADS logic in each trip system logic is arranged in two strings. Each string has a contact from each of the following variables: Low - Low Reactor Vessel Water Level; High Drywell Pressure; and Sustained Low - Low Reactor Vessel Water Level Time Delay. All required contacts in both logic strings must close, the ADS Time Delay must time out, and a CS or LPCI pump discharge pressure signal must be present to initiate an ADS trip system logic. Either the A or B trip system logic will cause all the ADS relief valves to open. Once the High Drywell Pressure signal, Sustained Low - Low Reactor Vessel Water Level Time Delay, or the ADS initiation signal is present, the trip system logic is sealed in until manually reset.

Manual inhibit switches are provided in the control room for the ADS; however, their function is not required for ADS operability (provided ADS is not inhibited when required to be operable).

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

BACKGROUND *(continued)*

Diesel Generators

Automatic initiation of the DGs occurs for conditions of Low - Low Reactor Vessel Water Level or High Drywell Pressure. Each of these diverse variables is monitored by four redundant transmitters, which are, in turn, connected to four trip units. The outputs of the four trip units are connected to relays whose contacts are connected to a one-out-of-two taken twice logic to initiate all DGs. The DGs receive their initiation signals from the CS System initiation logic. The DGs can also be started manually from the control room and locally from the associated DG room. Upon receipt of a loss of coolant accident (LOCA) initiation signal, each DG is automatically started, is ready to load within 13 seconds, and will run in standby conditions (rated voltage and frequency, with the DG output breaker open). The DGs will only energize their respective 4.16 kV emergency buses if a loss of offsite power occurs or if a degraded voltage occurs concurrent with an accident signal.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The actions of the ECCS are explicitly assumed in the safety analyses of References 1 and 2. The ECCS is initiated to preserve the integrity of the fuel cladding by ensuring the requirements of 10 CFR 50.46 are met.

ECCS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Certain instrumentation Trip Functions are retained for other reasons and are described below in the individual Trip Functions discussion.

The operability of the ECCS instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions specified in Table 3.2.1. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.1. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

In general, the individual Trip Functions are required to be operable in the Modes or other specified conditions that may require ECCS (or DG) initiation to mitigate the consequences of a design basis transient or accident. Table 3.2.1 Footnotes (a), (b), and (c) specifically indicate other conditions when certain ECCS Instrumentation Trip Functions are required to be operable. To ensure reliable ECCS and DG function, a combination of Trip Functions is required to provide primary and secondary initiation signals.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Trip Function by Trip Function basis.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Core Spray and Low Pressure Coolant Injection Systems

1.a, 2.b. High Drywell Pressure

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The low pressure ECCS and associated DGs are initiated upon receipt of the High Drywell Pressure Trip Function in order to minimize the possibility of fuel damage. The High Drywell Pressure Trip Function, along with the Low - Low Reactor Vessel Water Level Trip Function is directly assumed in the analysis of the recirculation line break (Ref. 1). The core cooling function of the ECCS, along with the scram action of the Reactor Protection System (RPS), ensures that the requirements of 10 CFR 50.46 are met.

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Trip Setting was selected to be indicative of a LOCA inside primary containment.

The High Drywell Pressure Trip Function is required to be operable when the ECCS or DG is required to be operable in conjunction with times when the primary containment is required to be operable. Thus, four channels of the CS and LPCI High Drywell Pressure Trip Functions are required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and Refuel (with reactor coolant temperature > 212°F) to ensure that no single instrument failure can preclude ECCS and DG initiation. In other Modes or conditions, the High Drywell Pressure Trip Function is not required, since there is insufficient energy in the reactor to pressurize the primary containment to High Drywell Pressure setpoint.

1.b, 2.c. Low - Low Reactor Vessel Water Level

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. The low pressure ECCS and associated DGs are initiated at Low - Low Reactor Vessel Water Level to ensure that core spray and flooding functions are available to prevent or minimize fuel damage. The Low - Low Reactor Vessel Water Level is one of the Trip Functions assumed to be operable and capable of initiating the ECCS and associated DGs during the accidents analyzed in References 1 and 2. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met.

Low - Low Reactor Vessel Water Level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The Low - Low Reactor Vessel Water Level Trip Setting is chosen to allow time for the low pressure core flooding systems to activate and provide adequate cooling. The Trip Setting is referenced from the top of enriched fuel.

Four channels of Low - Low Reactor Vessel Water Level Trip Function are only required to be operable when the ECCS or DG(s) are required to be operable to ensure that no single instrument failure can preclude ECCS and DG initiation.

1.c, 2.a. Low Reactor Pressure (Initiation)

Low reactor pressure signals, in conjunction with low RPV level, indicate that the capability to cool the fuel may be threatened. The low pressure ECCS are initiated upon simultaneous receipt of a low reactor pressure and a low-low reactor vessel water level signal to ensure that the core spray and flooding functions are available to prevent and minimize fuel damage. The Low Reactor Pressure (Initiation) is one of the Trip Functions assumed to be operable and capable of permitting initiation of the ECCS during the accidents analyzed in References 1 and 2. In addition, the Low Reactor Pressure (Initiation) Trip Function is directly assumed in the analysis of the recirculation line break (Ref. 1). The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met.

The Low Reactor Pressure (Initiation) signals are initiated from two pressure transmitters that sense the reactor pressure. Each transmitter provides an input to both low pressure ECCS logic trains, such that failure of one transmitter will cause a loss of redundancy but will not result in a loss of automatic low pressure ECCS pump start capability.

The Trip Setting is low enough to prevent overpressurizing the equipment in the low pressure ECCS, but high enough such that the ECCS injection will ensure the requirements of 10 CFR 50.46 are met.

Two channels per trip system of Low Reactor Pressure (Initiation) Trip Function are only required to be operable when the ECCS or DG(s) are required to be operable to ensure that no single instrument failure can preclude ECCS and DG initiation.

1.d, 2.h. Low Reactor Pressure (System Ready and Valve Permissive)

Low reactor pressure signals are used as permissives for the low pressure ECCS subsystems. This ensures that, prior to opening the injection valves of the low pressure ECCS subsystems, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. These low reactor pressure signals are also used as permissives for recirculation pump discharge valve closure and recirculation pump discharge bypass valve closure. This ensures that the LPCI subsystems inject into the proper RPV location assumed in the safety

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

analysis. Low Reactor Pressure (System Ready and Valve Permissive) is one of the Trip Functions assumed to be operable and capable of permitting initiation and injection of the ECCS and capable of closing the recirculation pump discharge valve(s) and recirculation pump discharge bypass valve(s) during the accidents and transients analyzed in References 1 and 2. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met. The Low Reactor Pressure (System Ready and Valve Permissive) Trip Function is directly assumed in the analysis of the recirculation line break (Ref. 1).

The Low Reactor Pressure (System Ready and Valve Permissive) signals are initiated from four pressure transmitters that sense the reactor pressure.

The Trip Setting is chosen to be low enough to prevent overpressurizing the equipment in the low pressure ECCS, but high enough such that the ECCS injection will ensure the requirements of 10 CFR 50.46 are met and to ensure that the recirculation pump discharge valves and recirculation pump discharge bypass valves close prior to commencement of LPCI injection flow into the core, as assumed in the safety analysis.

Four channels of the Low Reactor Pressure (System Ready and Valve Permissive) Trip Function are only required to be operable when the ECCS or DG(s) are required to be operable to ensure that no single instrument failure can preclude proper ECCS initiation and injection.

1.e, 2.e. CS and LPCI B and C Pump Start Time Delay

The purpose of these time delays is to stagger the start of the CS and RHR (LPCI) B and C pumps on the associated Division 1 and Division 2 buses, thus limiting the starting transients on the 4.16 kV emergency buses. These Trip Functions are necessary when power is being supplied from the standby power sources. The Core Spray Pump Start Time Delay and the LPCI B and C Pump Start Time Delay Trip Functions are assumed to be operable in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

There are two Core Spray Pump Start Time Delay relays, one for each trip system. Each time delay relay is dedicated to a single pump start logic, such that a single failure of a Core Spray Pump Start Time Delay relay will not result in failure of more than one CS pump. In this condition, one of the two CS pumps will remain operable; thus, single failure criterion is satisfied.

There are two LPCI B and C Pump Start Time Delay relays, one for each trip system. Each time delay relay is dedicated to a single pump start logic, such that a single failure of a LPCI B or C Pump Start Time Delay relay will not result in failure of more than one of the two associated LPCI pumps. In this condition, one of the two associated LPCI pumps will remain operable; thus, single failure criterion is satisfied.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The Trip Settings for the Core Spray and LPCI Pump B and C Pump Start Time Delays are chosen to be long enough so that most of the starting transient of the previously started pump is complete before starting a subsequent pump on the same 4.16 kV emergency bus and short enough so that ECCS operation is not degraded.

Each channel of the Core Spray and LPCI B and C Pump Start Time Delay Trip Functions is required to be operable when the associated CS and LPCI subsystems are required to be operable.

1.f, 2.f. CS and RHR Pump Discharge Pressure

The Pump Discharge Pressure signals from the CS and RHR pumps are used as permissives for ADS initiation, indicating that there is a source of low pressure cooling water available once the ADS has depressurized the vessel. Pump Discharge Pressure is one of the Trip Functions assumed to be operable and capable of permitting ADS initiation during the events analyzed in Reference 1 with an assumed HPCI failure. For these events, the ADS depressurizes the reactor vessel so that the low pressure ECCS can perform the core cooling functions. This core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met.

Pump discharge pressure signals are initiated from twelve pressure switches, two on the discharge side of each of the six low pressure ECCS pumps. In order to generate an ADS permissive in one trip system logic, it is necessary that only one pump (one of the two channels for the pump) indicate the high discharge pressure condition. The Pump Discharge Pressure Trip Setting is less than the pump discharge pressure when the pump is operating at all flow ranges and high enough to avoid any condition that results in a discharge pressure permissive when the CS and LPCI pumps are aligned for injection and the pumps are not running. The actual operating point of this function is not assumed in any transient or accident analysis.

Twelve channels of Core Spray and RHR Pump Discharge Pressure Trip Functions are only required to be operable when the ADS is required to be operable to ensure that no single instrument failure can preclude ADS initiation. Two CS channels associated with CS pump A and four LPCI channels associated with RHR pumps A and C are required for trip system logic A. Two CS channels associated with CS pump B and four LPCI channels associated with RHR pumps B and D are required for trip system logic B. However, each channel output is also electrically cross-connected such that each channel provides one logic contact in each ADS trip system logic.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

1.g, 2.i. CS and LPCI Auxiliary Power Monitors

The function of the CS and LPCI Auxiliary Power Monitors is to monitor emergency bus status and to implement load sequencing if the normal AC power supply is not available. The CS and LPCI Auxiliary Power Monitors are assumed to be operable in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

There are a total of two CS and LPCI Auxiliary Power Monitors, one dedicated to CS A and LPCI subsystem A, and one dedicated to CS B and LPCI subsystem B.

There are no Trip Settings specified for these Trip Functions, since they are logic relays that cannot be adjusted.

Each channel of the CS and LPCI Auxiliary Power Monitors is only required to be operable when the associated CS and LPCI subsystems are required to be operable to ensure that no single instrument failure can preclude proper DG load sequencing and subsequent low pressure ECCS initiation as assumed in the safety analyses.

1.h, 2.j. CS and LPCI Pump Bus Power Monitors

The function of the CS and LPCI Pump Bus Power Monitors is to monitor emergency bus status and to delay implementation of load sequencing until the associated emergency bus is powered, assuming a loss of the normal AC power supply. Alternately, assuming no loss of normal AC power supply, these monitors will prevent the CS and LPCI pump motor breakers from closing until the respective bus is energized. The CS and LPCI Pump Bus Power Monitors are assumed to be operable in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

There are a total of four CS and LPCI Pump Bus Power Monitors, two dedicated to CS A and LPCI subsystem A, and two dedicated to CS B and LPCI subsystem B.

There are no Trip Settings specified for these Trip Functions, since they are logic relays that cannot be adjusted.

One of the two channels per Trip System of the CS and LPCI Pump Bus Power Monitors are only required to be operable when the associated CS and LPCI subsystems are required to be operable to ensure that no single instrument failure can preclude proper DG load sequencing and subsequent low pressure ECCS initiation as assumed in the safety analyses.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2.e. Reactor Vessel Shroud Level

The Reactor Vessel Shroud Level Trip Function is provided as a permissive to allow the RHR System to be manually aligned from the LPCI mode to the suppression pool cooling/spray or drywell spray modes. The permissive ensures that water level in the vessel is at least two thirds core height before the manual transfer is allowed. This ensures that LPCI is available to prevent or minimize fuel damage. This Trip Function may be overridden during accident conditions as allowed by plant procedures. The Reactor Vessel Shroud Level Trip Function is implicitly assumed in the analysis of the recirculation line break (Ref. 1) since the analysis assumes that no LPCI flow diversion occurs when reactor water level is below the Reactor Vessel Shroud Level.

Reactor Vessel Shroud Level signals are initiated from two level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Reactor Vessel Shroud Level Trip Setting is chosen to allow the low pressure core flooding systems to activate and provide adequate cooling before allowing a manual transfer.

Two channels of the Reactor Vessel Shroud Level Trip Function are only required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and Refuel (with reactor coolant temperature > 212°F). In other Modes or conditions, the specified initiation time of the LPCI subsystems is not assumed, and other administrative controls are adequate to control the valves that this Trip Function isolates (since the systems that the valves are opened for are not required to be operable in these other Modes or conditions and are normally not used).

2.g. LPCI High Drywell Pressure (Containment Spray Permissive)

The High Drywell Pressure (Containment Spray Permissive) Trip Function is provided as a permissive to allow the RHR System to be manually aligned from the LPCI mode to the suppression pool cooling/spray or drywell spray modes. The permissive prevents the operator from inadvertently initiating containment spray, when it is not required to reduce drywell pressure, during a LOCA. This ensures that LPCI is available to prevent or minimize fuel damage. The High Drywell Pressure (Containment Spray Permissive) Trip Function is implicitly assumed in the analysis of the recirculation line break (Ref. 1) since the analysis assumes that LPCI flow is available when required.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Trip Setting was selected to be indicative of a LOCA inside primary containment.

The High Drywell Pressure (Containment Spray Permissive) Trip Function is required to be operable when LPCI is required to be operable in conjunction with times when the primary containment is required to be operable. Thus, four channels of the High Drywell Pressure (Containment Spray Permissive) Trip Function are required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and Refuel (with reactor coolant temperature > °F) to ensure that no single instrument failure can preclude LPCI initiation or cause inadvertent flow diversion. In other Modes or conditions, the specified initiation time of the LPCI subsystems is not assumed, and other administrative controls are adequate to control the valves that this Trip Function isolates (since the systems that the valves are opened for are not required to be operable in these other Modes or conditions and are normally not used).

HPCI System

3.a. Low - Low Reactor Vessel Water Level

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the HPCI System is initiated at Low - Low Reactor Vessel Water Level to maintain level above the top of the active fuel. The Low - Low Reactor Vessel Water Level is one of the Trip Functions assumed to be operable and capable of initiating HPCI during the accidents and transients analyzed in References 1 and 2.

Low - Low Reactor Vessel Water Level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. The Low - Low Reactor Vessel Water Level Trip Setting is high enough above the top of enriched fuel to start HPCI in time to prevent fuel uncovering for small breaks, but far enough below normal levels that spurious HPCI startups are avoided. The Trip Setting is referenced from the top of enriched fuel.

Four channels of Low - Low Reactor Vessel Water Level Trip Function are required to be operable only when HPCI is required to be operable to ensure that no single instrument failure can preclude HPCI initiation.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

3.b Low Condensate Storage Tank Level

Low level in the CST indicates the unavailability of an adequate supply of makeup water from this normal source. Normally the suction valves between HPCI and the CST are open and, upon receiving a HPCI initiation signal, water for HPCI injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, first the suppression pool suction valves automatically open. When the suppression pool suction valves both start to open, the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the HPCI pump. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valves must both start to open before the CST suction valve automatically closes. The Trip Function is implicitly assumed in the accident and transient analyses (which take credit for HPCI) since the analyses assume that the HPCI suction source is the suppression pool.

The Low Condensate Storage Tank Level signal is initiated from two level transmitters. The logic is arranged such that either level transmitter can cause the suppression pool suction valves to open and the CST suction valve to close. The Low Condensate Storage Tank Level Trip Function Trip Setting is high enough to ensure adequate pump suction head while water is being taken from the CST. The Trip Setting is presented in terms of percent instrument span.

Two channels of the Low Condensate Storage Tank Level Trip Function are required to be operable only when HPCI is required to be operable to ensure that no single instrument failure can preclude HPCI swap to suppression pool source.

3.c. High Drywell Pressure

High pressure in the drywell could indicate a break in the RCPB. The HPCI System is initiated upon receipt of the High Drywell Pressure Trip Function in order to minimize the possibility of fuel damage. The High Drywell Pressure Trip Function associated with HPCI is not assumed in accident or transient analyses. It is retained since it is a potentially significant contributor to risk.

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Trip Setting was selected to be as low as possible to be indicative of a LOCA inside primary containment.

Four channels of the High Drywell Pressure Trip Function are required to be operable when HPCI is required to be operable to ensure that no single instrument failure can preclude HPCI initiation.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

3.d. High Reactor Vessel Water Level

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the High Reactor Vessel Water Level signals are used to trip the HPCI turbine to prevent overflow into the main steam lines (MSLs) to preclude an unanalyzed event.

High Reactor Vessel Water Level signals for HPCI are initiated from two level transmitters from the narrow range water level measurement instrumentation. Both High Reactor Vessel Water Level signals are required in order to close the HPCI turbine stop valve. This ensures that no single instrument failure can preclude HPCI initiation. The High Reactor Vessel Water Level Trip Setting is high enough to avoid interfering with HPCI System operation during reactor water level recovery resulting from low reactor water level events and low enough to prevent flow from the HPCI System from overflowing into the MSLs. The Trip Setting is referenced from the top of enriched fuel.

Two channels of the High Reactor Vessel Water Level Trip Function are required to be operable only when HPCI is required to be operable.

Automatic Depressurization System (ADS)

4.a. Low - Low Reactor Vessel Water Level

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, ADS receives one of the signals necessary for initiation from this Trip Function. The Low - Low Reactor Vessel Water Level is one of the Trip Functions assumed to be operable and capable of initiating the ADS during the accident analyzed in Reference 1. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met.

Low - Low Reactor Vessel Water Level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Low - Low Reactor Vessel Water Level Trip Function are required to be operable only when ADS is required to be operable to ensure that no single instrument failure can preclude ADS initiation. Two channels input to ADS trip system logic A, while the other two channels input to ADS trip system logic B.

The Low - Low Reactor Vessel Water Level Trip Setting is chosen to allow time for the low pressure core flooding systems to initiate and provide adequate cooling. The Trip Setting is referenced from the top of enriched fuel.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.b High Drywell Pressure

High pressure in the drywell could indicate a break in the RCPB. Therefore, ADS receives signals necessary for initiation from this Trip Function in order to minimize the possibility of fuel damage. The High Drywell Pressure Trip Function is assumed to be operable and capable of initiating the ADS during accidents analyzed in Reference 1. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the requirements of 10 CFR 50.46 are met.

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Trip Setting was selected to be as low as possible to be indicative of a LOCA inside primary containment. Four channels of High Drywell Pressure Trip Function are required to be operable only when ADS is required to be operable to ensure that no single instrument failure can preclude ADS initiation. Two channels input to ADS trip system logic A, while the other two channels input to ADS trip system logic B.

4.c. Time Delay

The purpose of the ADS Time Delay is to delay depressurization of the reactor vessel to allow the HPCI System time to restore and maintain reactor vessel water level. Since the rapid depressurization caused by ADS operation is one of the most severe transients on the reactor vessel, its occurrence should be limited. By delaying initiation of the ADS function, the operator is given the chance to monitor the success or failure of the HPCI System to maintain water level, and then to decide whether or not to allow ADS to initiate or to inhibit initiation. The ADS Time Delay Trip Function is assumed to be operable for the accident analyses of Reference 1 that require ECCS initiation and assume failure of the HPCI System.

There are two ADS Time Delay relays, one in each of the two ADS trip system logics. The Trip Setting for the ADS Time Delay is chosen to be long enough to allow HPCI to start and avoid an inadvertent blowdown yet short enough so that there is still time after depressurization for the low pressure ECCS subsystems to provide adequate core cooling.

Two channels of the ADS Time Delay Trip Function are only required to be operable when the ADS is required to be operable to ensure that no single instrument failure can preclude ADS initiation. One channel inputs to ADS trip system logic A, while the other channel inputs to ADS trip system logic B.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.d. Sustained Low - Low Reactor Vessel Water Level Time Delay

One of the signals received for ADS initiation is High Drywell Pressure. However, if the event requiring ADS occurs outside the drywell (e.g., main steam line break outside containment), a high drywell pressure signal may never be present. Therefore, the Sustained Low - Low Reactor Vessel Water Level Time Delay Trip Function is used to bypass the High Drywell Pressure Trip Function after a certain time period has elapsed. The instrumentation is retained in the TS because ADS is part of the primary success path for mitigation of a DBA.

There are four Sustained Low - Low Reactor Vessel Water Level Time Delay relays, two in each of the two ADS trip system logics. The Trip Setting for the Sustained Low - Low Reactor Vessel Water Level Time Delay is chosen to ensure that there is still time after depressurization for the low pressure ECCS subsystems to provide adequate core cooling.

Four channels of the Sustained Low - Low Reactor Vessel Water Level Time Delay Trip Function are only required to be operable when the ADS is required to be operable to ensure that no single instrument failure can preclude ADS initiation.

ACTIONS

Table 3.2.1 ACTION Note 1

Table 3.2.1 ACTION Note 1.a is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in redundant automatic initiation capability being lost for the feature(s). Table 3.2.1 ACTION Note 1.a features would be those that are initiated by Trip Function 1.a, 1.b, 2.b, and 2.c (e.g., low pressure ECCS). Redundant automatic initiation capability is lost if (a) two Trip Function 1.a channels are inoperable and untripped in the same trip system, (b) two Trip Function 1.b channels are inoperable and untripped in the same trip system, (c) two Trip Function 2.b channels are inoperable and untripped in the same system, or (d) two Trip Function 2.c channels are inoperable and untripped in the same trip system. Each inoperable channel would only require the affected portion of the associated system of low pressure ECCS and DGs to be declared inoperable. However, since channels in both associated low pressure ECCS subsystems (e.g., both CS subsystems) are inoperable and untripped, and the completion times of Table 3.2.1 ACTION Note 1.a started concurrently for the channels in both subsystems, this results in the affected portions in the associated low pressure ECCS and DGs being concurrently declared inoperable.

In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Table 3.2.1 ACTION Note 1.b is not appropriate and the feature(s) associated with the inoperable, untripped channels must be declared

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

inoperable within 1 hour. The Table 3.2.1 ACTION Note completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 1.a, the completion time only begins upon discovery of a loss of initiation capability for feature(s) in both divisions (i.e., that a redundant feature in the same system (e.g., both CS subsystems) cannot be automatically initiated due to inoperable, untripped channels within the same Trip Function as described in the paragraph above). The 1 hour completion time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.1 ACTION Note 1.b. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue.

Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), the associated systems must be declared inoperable. With any applicable Action and associated completion time not met, the associated subsystem(s) may be incapable of performing the intended function, and the supported subsystem(s) associated with inoperable untripped channels must be declared inoperable immediately.

Table 3.2.1 ACTION Note 2

Table 3.2.1 ACTION Note 2.a is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Trip Function result in automatic initiation capability being lost for the feature(s). Table 3.2.1 ACTION Note 2.a features would be those that are initiated by Trip Functions 1.c, 1.d, 1.e, 1.g, 1.h, 2.a, 2.e, 2.h, 2.i, and 2.j (i.e., low pressure ECCS). Automatic initiation capability is lost if either (a) two Trip Function 1.c channels are inoperable, (b) two Trip Function 1.d channels are inoperable in the same trip system, (c) one Trip Function 1.e channel is inoperable in each trip system, (d) one Trip Function 1.g channel is inoperable in each trip system, (e) two Trip Function 1.h channels inoperable in each trip system, (f) two Trip Function 2.a channels are inoperable, (g) one Trip Function 2.e channel inoperable in each trip system, (h) two Trip Function 2.h channels inoperable in the same trip system, (i) one Trip Function 2.i channel inoperable in each trip system or (j) two Trip Function 2.j channels inoperable in each trip system. Each inoperable channel would only require the affected portion of the associated system of low pressure

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

ECCS to be declared inoperable. However, since channels in both associated low pressure ECCS subsystems (e.g., both CS subsystems) are inoperable and untripped, and the completion times of Table 3.2.1 ACTION Note 2.a started concurrently for the channels in both subsystems, this results in the affected portions in the associated low pressure ECCS being concurrently declared inoperable. For Functions 1.e and 2.e, the affected portions are the associated low pressure ECCS pumps.

In this situation (loss of automatic initiation capability), the 24 hour allowance of Table 3.2.1 ACTION Note 2.b is not appropriate and the feature(s) associated with the inoperable channels must be declared inoperable within 1 hour. The Table 3.2.1 ACTION Note completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 2.a, the Completion Time only begins upon discovery of a loss of initiation capability for feature(s) in both divisions (i.e., that a redundant feature in the same system (e.g., both CS subsystems) cannot be automatically initiated due to inoperable, untripped channels within the same Trip Function as described in the paragraph above). The 1 hour completion time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the associated systems must be declared inoperable. With any applicable Action and associated completion time not met, the associated subsystem(s) may be incapable of performing the intended function, and the supported subsystem(s) associated with inoperable channels must be declared inoperable immediately. The Required Actions do not allow placing the channel in trip since this action would either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

Table 3.2.1 ACTION Note 3

Table 3.2.1 ACTION Note 3.a is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Trip Function result in redundant automatic initiation capability being lost for the feature(s). Table 3.2.1 ACTION Note 3.a features would be those that are initiated by Trip Functions 2.d and 2.g (i.e., LPCI). Redundant automatic initiation capability is lost if one Trip Function 2.d channel is inoperable in each trip system or if two Trip Function 2.g channels are inoperable in the same trip system. Each inoperable channel would only require the affected portion of the associated LPCI subsystem to be declared inoperable. However, since channels in both associated LPCI subsystems are inoperable and untripped, and the completion times of Table 3.2.1 ACTION Note 3.a started concurrently for the

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

channels in both subsystems, this results in the affected portions in the associated LPCI subsystems being concurrently declared inoperable. Table 3.2.1 ACTION Note 3.a is not applicable to Trip Function 2.d, since this Trip Function provides backup to administrative controls ensuring that operators do not divert LPCI flow from injecting into the core when needed. Thus, a total loss of Trip Function 2.d capability for 24 hours is allowed, since the LPCI subsystems remain capable of performing their intended function.

In the situation of loss of redundant automatic initiation capability for Trip Function 2.g, the 24 hour allowance of Table 3.2.1 ACTION Note 3.b is not appropriate and the feature(s) associated with the inoperable channels must be declared inoperable within 1 hour. The Table 3.2.1 ACTION Note completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 3.a, the Completion Time only begins upon discovery of a loss of LPCI initiation capability due to inoperable, untripped channels within the Trip Function 2.g as described in the paragraph above. The 1 hour completion time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref.3) to permit restoration of any inoperable channel to operable status. If an inoperable channel for Trip Function 2.d cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.1 ACTION Note 3.b. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accomodate a single failure, and allow operation to continue. If an inoperable channel for Trip Function 2.g cannot be restored to operable status within the allowable out of service time, the associated systems must be declared inoperable. With any applicable Action and associated completion time not met, the associated subsystem(s) may be incapable of performing the intended function, and the supported subsystem(s) associated with the inoperable channels must be declared inoperable immediately.

Table 3.2.1 ACTION Note 4

Table 3.2.1 ACTION Note 4.a is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Trip Function result in redundant automatic initiation capability being lost for the feature(s). The Table 3.2.1 ACTION Note 4.a feature would be HPCI. Redundant automatic initiation capability is lost if two Trip Function 3.a or two Trip Function 3.c channels are inoperable and untripped in the same trip system logic.

In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Table 3.2.1 ACTION Note 4.b is not appropriate and the feature(s) associated with the inoperable, untripped channels must be declared

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

inoperable within 1 hour. The Table 3.2.1 ACTION Note completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 4.a, the completion time only begins upon discovery of a loss of HPCI initiation capability due to inoperable, untripped channels within the same Trip Function as described in the paragraph above. The 1 hour completion time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.1 ACTION Note 4.b. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue.

Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), the HPCI System must be declared inoperable. With any applicable Action and associated completion time not met, the HPCI System may be incapable of performing the intended function, and the HPCI System must be declared inoperable immediately.

Table 3.2.1 ACTION Note 5

Table 3.2.1 ACTION Note 5.a is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in a complete loss of automatic component initiation capability for the HPCI System. Automatic component initiation capability is lost if two Trip Function 3.b channels are inoperable and untripped. In this situation (loss of automatic suction swap), the 24 hour allowance of Table 3.2.1 ACTION Note 5.b is not appropriate and the HPCI System must be declared inoperable within 1 hour after discovery of loss of HPCI initiation capability. Table 3.2.1 ACTION Note 5.a is only applicable if the HPCI pump suction is not aligned to the suppression pool, since, if aligned, the Trip Function is already performed.

The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 5.a, the completion time only begins upon discovery that the HPCI System cannot be automatically aligned to the suppression pool due to two inoperable, untripped channels in the same Trip Function as described in the paragraph

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition or the suction source must be aligned to the suppression pool per Table 3.2.1 ACTION Note 5.b. Placing the inoperable channel in trip performs the intended function of the channel (shifting the suction source to the suppression pool). Performance of either of the two actions of Table 3.2.1 ACTION Note 5.b will allow operation to continue. If Table 3.2.1 ACTION Note 5.b is performed, measures should be taken to ensure that the HPCI System piping remains filled with water. Alternately, if it is not desired to perform Table 3.2.1 ACTION NOTE 5.b (e.g., as in the case where shifting the suction source could drain down the HPCI suction piping), the HPCI System must be declared inoperable. With any applicable Action and associated completion time not met, the HPCI System may be incapable of performing the intended function, and the HPCI System must be declared inoperable immediately.

Table 3.2.1 ACTION Note 6

For Trip Function 3.d, the loss of one or more channels results in a loss of the function (two-out-of-two logic). This loss was considered during the development of Reference 3 and considered acceptable for the 24 hours allowed to permit restoration of the inoperable channel to operable status by Table 3.2.1 ACTION Note 6.a. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the HPCI System must be declared inoperable. With any applicable Action and associated completion time not met, the HPCI System may be incapable of performing the intended function, and the HPCI System must be declared inoperable immediately. The Required Actions do not allow placing the channel in trip since this action would either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

Table 3.2.1 ACTION Note 7

Table 3.2.1 ACTION Note 7.a is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in redundant automatic initiation capability being lost for the ADS. Redundant automatic initiation capability is lost if either (a) one or more Trip Function 4.a channels are inoperable and untripped in each trip system logic, or (b) one or more Trip Function 4.b channels are inoperable and untripped in each trip system.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

In this situation (loss of automatic initiation capability), the 96 hour or 8 day allowance, as applicable, of Table 3.2.1 ACTION Note 7.b or 7.c, respectively, is not appropriate and all ADS valves must be declared inoperable within 1 hour after discovery of loss of ADS initiation capability. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 7.a, the completion time only begins upon discovery that the ADS cannot be automatically initiated due to inoperable, untripped channels within the same Trip Function as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 8 days has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status if both HPCI and RCIC are operable (Table 3.2.1 ACTION Note 7.c). If either HPCI or RCIC is inoperable, the time is shortened to 96 hours (Table 3.2.1 ACTION Note 7.b). If the status of HPCI or RCIC changes such that the completion time changes from 8 days to 96 hours, the 96 hours begins upon discovery of HPCI or RCIC inoperability. However, the total time for an inoperable, untripped channel cannot exceed 8 days. If the status of HPCI or RCIC changes such that the completion time changes from 96 hours to 8 days, the 8 day allowable out of service time begins upon discovery of the inoperable, untripped channel. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.1 ACTION Note 7.b or 7.c, as applicable. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), the ADS must be declared inoperable. With any applicable Action and associated completion time not met, the ADS may be incapable of performing the intended function, and the ADS must be declared inoperable immediately.

Table 3.2.1 ACTION Note 8

Table 3.2.1 ACTION Note 8.a is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Trip Function result in redundant automatic initiation capability being lost for the ADS. Redundant automatic initiation capability is lost if either (a) one Trip Function 4.c channel is inoperable in each trip system logic (i.e., 2 channels are inoperable), (b) one or more Trip Function 4.d channels are inoperable in each trip system logic, or (c) all Trip Function 1.f and 2.f channels are inoperable.

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

ACTIONS (continued)

In this situation (loss of automatic initiation capability), the 96 hour or 8 day allowance, as applicable, of Table 3.2.1 ACTION Note 8.b or 8.c, respectively, is not appropriate and all ADS valves must be declared inoperable within 1 hour after discovery of loss of ADS initiation capability. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.1 ACTION Note 8.a, the completion time only begins upon discovery that the ADS cannot be automatically initiated due to inoperable channels within the same Trip Function as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 8 days has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to operable status if both HPCI and RCIC are operable (Table 3.2.1 ACTION Note 8.c). If either HPCI or RCIC is inoperable, the time shortens to 96 hours (Table 3.2.1 ACTION Note 8.b). If the status of HPCI or RCIC changes such that the completion time changes from 8 days to 96 hours, the 96 hours begins upon discovery of HPCI or RCIC inoperability. However, the total time for an inoperable channel cannot exceed 8 days. If the status of HPCI or RCIC changes such that the completion time changes from 96 hours to 8 days, the 8 day allowable out of service time begins upon discovery of the inoperable channel. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the ADS must be declared inoperable. With any applicable Action and associated completion time not met, the ADS may be incapable of performing the intended function, and the ADS must be declared inoperable immediately. The Required Actions do not allow placing the channel in trip since this action would not necessarily result in a safe state for the channel in all events.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.A.1

As indicated in Surveillance Requirement 4.2.A.1, ECCS instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.1. Table 4.2.1 identifies, for each ECCS Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.A.1 also indicates that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours as follows: (a) for Trip Function 3.d; and (b) for Trip Functions other than 3.d provided the associated Trip Function or redundant Trip Function maintains initiation capability. Upon completion of the

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

SURVEILLANCE REQUIREMENTS *(continued)*

Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary.

Surveillance Requirement 4.2.A.2

The Logic System Functional Test demonstrates the operability of the required initiation logic and simulated automatic operation for a specific channel. The simulated automatic actuation testing required by the ECCS Technical Specifications and Diesel Generator Technical Specifications overlaps this Surveillance to provide testing of the assumed safety function. For the ADS Trip Functions, this Logic System Functional Test requirement does not include solenoids of the ADS valves. However, a simulated automatic actuation, which opens all pilot valves of the ADS valves, shall be performed such that each trip system logic can be verified independent of its redundant counterpart. In addition, for the ADS Trip Functions, the Logic System Functional Test will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the ADS manual inhibit switches prevent opening all ADS valves will be accomplished in conjunction with Surveillance Requirement 4.5.F.1. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.2.1, Check

Performance of an Instrument Check once per day for Trip Functions 1.a, 1.b, 1.g, 1.h, 2.b, 2.c, 2.i, 2.j, 3.a, 3.c, 4.a, and 4.b, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency

BASES: 3.2.A/4.2.A EMERGENCY CORE COOLING SYSTEM (ECCS)

SURVEILLANCE REQUIREMENTS (continued)

is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Table 4.2.1, Functional Test

For Trip Functions 1.a, 1.b, 1.c, 1.d, 1.f, 1.g, 1.h, 2.a, 2.b, 2.c, 2.d, 2.f, 2.g, 2.h, 2.i, 2.j, 3.a, 3.b, 3.c, 3.d, 4.a, and 4.b, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of "Every 3 Months" is based on the reliability analysis of Reference 3.

Table 4.2.1, Calibration

For Trip Functions 1.a, 1.b, 1.c, 1.d, 1.e, 1.f, 2.a, 2.b, 2.c, 2.d, 2.e, 2.f, 2.g, 2.h, 3.a, 3.b, 3.c, 3.d, 4.a, 4.b, 4.c, and 4.d, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

For Trip Functions 1.a, 1.b, 1.c, 1.d, 2.a, 2.b, 2.c, 2.d, 2.g, 2.h, 3.a, 3.c, 3.d, 4.a, and 4.b, a calibration of the trip units is required (Footnote (a)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The Frequency of every 3 months is based on the reliability analysis of Reference 3 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

REFERENCES

1. UFSAR, Section 6.5.

2. UFSAR, Chapter 14.

3. NEDC-30936-P-A, BWR Owners' Group Technical Specification Improvement Methodology (With Demonstration for BWR ECCS Actuation Instrumentation), Parts 1 and 2, December 1988.

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Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Change 273

Revised Technical Specification Bases Pages

Tab 2.D

Primary Containment Isolation

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

BACKGROUND

The primary containment isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves (PCIVs). The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). Primary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a primary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logics are (a) reactor vessel water level, (b) area ambient temperatures, (c) main steam line (MSL) flow, (d) main steam line pressure, (e) condenser vacuum, (f) drywell pressure, (g) high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) steam line d/p, (h) HPCI and RCIC steam line pressure, and (i) reactor vessel pressure. Redundant sensor input signals from each parameter are provided for initiation of isolation.

Primary containment isolation instrumentation has inputs to the trip logic of the isolation functions listed below.

1. Main Steam Line Isolation

The Low - Low Reactor Vessel Water Level, Low Main Steam Line Pressure, High Main Steam Line Flow - Not in RUN, and Condenser Low Vacuum Trip Functions each receive inputs from four channels. The outputs of these channels are combined in a one-out-of-two taken twice logic to initiate isolation of all main steam isolation valves (MSIVs), MSL drain valves, and recirculation loop sample isolation valves.

The High Main Steam Line Flow Trip Function uses 16 flow channels, four for each steam line. One channel from each steam line inputs to one of the four trip strings. Two trip strings make up each trip system and both trip systems must trip to cause an isolation of all MSIVs, MSL drain valves, and recirculation sample isolation valves. Each trip string has four inputs (one per MSL), any one of which will trip the trip string. The trip strings are arranged in a one-out-of-two taken twice logic. This is effectively a one-out-of-eight taken twice logic arrangement to initiate isolation.

The High Main Steam Line Area Temperature Trip Function receives input from 16 channels, four for each of four main steam line areas. The logic is arranged similar to the High Main Steam Line Flow Trip Function. One channel from each steam tunnel area inputs to one of four trip strings. Two trip strings make up a trip system and both trip systems must trip to cause isolation.

MSL Isolation Trip Functions isolate the Group 1 valves.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

BACKGROUND (continued)

2. Primary Containment Isolation

The Low Reactor Vessel Water Level and High Drywell Pressure Trip Functions each receive inputs from four channels. For each Trip Function, the outputs of these channels are combined in a one-out-of-two taken twice logic to initiate isolation of the PCIVs identified in Reference 1.

Primary Containment Isolation Trip Functions isolate the Groups 2, 3, and 4 valves. Group 5 valves are also isolated by the Low Reactor Vessel Water Level Trip Function.

3, 4. High Pressure Coolant Injection System Isolation and Reactor Core Isolation Cooling System Isolation

The HPCI High Steam Line d/p, RCIC High Steam Line d/p, and RCIC High Steam Line d/p Time Delay Trip Functions each receive input from two channels, with each channel in one trip system using a one-out-of-one logic. The trip systems are arranged in a one-out-of-two logic. Each of the two trip systems is connected to both valves on the associated penetration.

The HPCI and RCIC Low Steam Supply Line Pressure Trip Functions each receive input from four steam supply pressure channels. The outputs from the associated steam supply pressure channels are connected in a one-out-of-two-twice trip system logic arrangement. There are two trip system logics which provide input to one trip system. The trip system must trip to initiate isolation of both valves on the associated penetration.

The HPCI and RCIC High Main Steam Line Tunnel Temperature Trip Functions each receive input from 4 channels. Four channels, each with an associated temperature switch, are connected in a one-out-of-two-twice arrangement which provides input to two trip systems. Both trip systems must trip to initiate isolation of both valves on the associated penetration. In addition, the HPCI and RCIC High Main Steam Line Tunnel Temperature Trip Functions each have time delays. These Time Delay Trip Functions each receive input from two channels, with each channel in one of the trip system using a one-out-of-one logic. The trip systems are arranged in a one-out-of-two logic.

The HPCI and RCIC High Steam Line Space Temperature Trip Functions each receive input from 12 channels. There are three steam line areas each monitored by one set of four channels. One channel from each of the three steam line areas inputs to one of the four trip strings. Two trip strings make up each trip system and both trip systems must trip to cause an isolation of both valves on the associated penetration. The trip strings are arranged in a one-out-of-two taken twice logic. This is effectively a one-out-of-six taken twice logic arrangement to initiate isolation.

HPCI System and RCIC System Isolation Trip Functions isolate the Group 6 valves, as appropriate.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

BACKGROUND (continued)

5. Residual Heat Removal Shutdown Cooling Isolation

The High Reactor Pressure Trip Function receives input from two channels. The outputs from these channels are arranged in a one-out-of-two logic to initiate isolation of the Shutdown Cooling (SDC) supply isolation valves.

The Residual Heat Removal Shutdown Cooling Isolation Trip Function isolates the Group 4 SDC supply isolation valves.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The isolation signals generated by the primary containment isolation instrumentation are implicitly assumed in the safety analyses of Reference 2 to initiate closure of valves to limit offsite doses.

Primary containment isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Certain instrumentation Trip Functions are retained for other reasons and are described below in the individual Trip Functions discussion.

The operability of the primary containment isolation instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions specified in Table 3.2.2. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.2. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Certain Emergency Core Cooling Systems (ECCS) valves (e.g., containment spray isolation valves) also serve the dual function of automatic PCIVs. The signals that isolate these valves are also associated with the automatic initiation of the ECCS. Some instrumentation requirements and Actions associated with these signals are addressed in Specification 3.2.A, "Emergency Core Cooling Systems (ECCS)," and are not included in this specification.

In general, the individual Trip Functions are required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel (with reactor coolant temperature >212°F) consistent with the Applicability for Primary Containment Integrity requirements in Specification 3.7.A.2. Trip Functions that have different Applicabilities are discussed below in the individual Trip Functions discussion.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Trip Function by Trip Function basis.

Main Steam Line Isolation

1.a. Low - Low Reactor Vessel Water Level

Low reactor pressure vessel (RPV) water level indicates that the capability to

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of the MSIVs and other interfaces with the reactor vessel occurs to prevent offsite dose limits from being exceeded. The Low - Low Reactor Vessel Water Level Trip Function is one of the many Trip Functions assumed to be operable and capable of providing isolation signals. The Low - Low Reactor Vessel Water Level Trip Function associated with isolation is assumed in the analysis of the recirculation line break (Ref. 3). The isolation of the MSLs supports actions to ensure that offsite dose limits are not exceeded for a DBA.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Low - Low Reactor Vessel Water Level Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Low - Low Reactor Vessel Water Level Trip Setting is chosen to be the same as the ECCS Low - Low Reactor Vessel Water Level Trip Setting (Specification 3.2.A) to ensure that the MSLs isolate on a potential loss of coolant accident (LOCA) to prevent offsite doses from exceeding 10 CFR 50.67 limits. The Trip Setting is referenced from the top of enriched fuel.

This Function isolates the Group 1 valves.

1.b. High Main Steam Line Area Temperature

Main steam line tunnel temperature is provided to detect a leak in the RCPB in the steam tunnel and provides diversity to the high flow instrumentation. Temperature is sensed in four different areas of the steam tunnel in the vicinity of the main steam lines. The isolation occurs when a very small leak has occurred in any one of the four areas. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. However, credit for these instruments is not taken in any transient or accident analysis in the UFSAR, since bounding analyses are performed for large breaks, such as MSLBs.

Main steam line area temperature signals are initiated from a total of sixteen temperature switches located in the four areas being monitored. Sixteen channels of High Main Steam Line Area Temperature Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The High Main Steam Line Area Temperature Trip Setting is chosen to provide early indication of a steam line break.

These Functions isolate the Group 1 valves.

1.c. High Main Steam Line Flow

High Main Steam Line Flow is provided to detect a break of the MSL and to initiate closure of the MSIVs. If the steam were allowed to continue flowing out of the break, the reactor would depressurize and the core could uncover. If the RPV water level decreases too far, fuel damage could occur. Therefore,

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

the isolation is initiated on high flow to prevent or minimize core damage. The High Main Steam Line Flow Trip Function is directly assumed in the analysis of the main steam line break (MSLB) (Ref. 4). The isolation action, along with the scram function of the Reactor Protection System (RPS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46 and offsite doses do not exceed the 10 CFR 50.67 limits.

The MSL flow signals are initiated from 16 differential pressure transmitters that are connected to the four MSLs (the differential pressure transmitters sense differential pressure across a flow restrictor). The differential pressure transmitters are arranged such that, even though physically separated from each other, all four connected to one MSL would be able to detect the high flow. Four channels of High Main Steam Line Flow Trip Function for each MSL (two channels per trip system) are available and are required to be operable so that no single instrument failure will preclude detecting a break in any individual MSL.

The Trip Setting is chosen to ensure that fuel peak cladding temperature and offsite dose limits are not exceeded due to the break.

This Trip Function isolates the Group 1 valves.

1.d. Low Main Steam Line Pressure

Low MSL pressure indicates that there may be a problem with the turbine pressure regulation, which could result in a low reactor vessel water level condition and the RPV cooling down more than 100°F/hr if the pressure loss is allowed to continue. The Low Main Steam Line Pressure Trip Function is directly assumed in the analysis of the pressure regulator failure (Ref. 5). For this event, the closure of the MSIVs ensures that the RPV temperature change limit (100°F/hr) is not reached. In addition, this Trip Function supports actions to ensure that Safety Limit 1.1.B is not exceeded. (This Trip Function closes the MSIVs at ≥800 psig prior to pressure decreasing below 785 psig [800 psia], which results in a scram due to MSIV closure, thus reducing reactor power to < 23% RATED THERMAL POWER.)

The MSL low pressure signals are initiated from four pressure switches that are connected to the MSL header. The switches are arranged such that, even though physically separated from each other, each pressure switch is able to detect low MSL pressure. Four channels of Low Main Steam Line Pressure Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Setting was selected to be high enough to prevent excessive RPV depressurization.

The Low Main Steam Line Pressure Trip Function is only required to be operable in the RUN Mode since this is when the assumed transient can occur (Ref. 5).

This Trip Function isolates the Group 1 valves.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

1.e. High Main Steam Line Flow - Not in RUN

High Main Steam Line Flow when the reactor mode switch is not in RUN provides protection for a turbine pressure regulator malfunction which causes the turbine control valves and turbine bypass valves to open or protection for a main steam line break. These events would result in a rapid depressurization and cooldown of the RPV. The High Main Steam Line Flow - Not in RUN Trip Function was credited in the MSLB at low power analysis.

The MSL flow signals are initiated from 4 differential pressure transmitters, one connected to each of the four MSLs (the differential pressure switches sense differential pressure across a flow restrictor). Four channels of High Main Steam Line Flow - Not in RUN Trip Function (two channels per trip system) are available and are required to be operable so that no single instrument failure will preclude providing protection against a turbine pressure regulator malfunction or a break in any individual MSL.

The Trip Setting is chosen to provide early indication of a steam line break.

The High Main Steam Line Flow - Not in RUN Trip Function is only required to be operable in STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel (with reactor coolant temperature >212°F). In the RUN Mode, protection for the depressurization resulting from a turbine pressure regulator malfunction is provided by the Low Main Steam Line Pressure Trip Function and protection for depressurization resulting from a main steam line break is provided by the High Main Steam Line Flow Trip Function.

This Trip Function isolates the Group 1 valves.

1.f. Low Condenser Vacuum

The Low Condenser Vacuum Trip Function is provided to prevent overpressurization of the main condenser in the event of a loss of the main condenser vacuum. Since the integrity of the condenser is an assumption in offsite dose calculations, the Low Condenser Vacuum Trip Function is assumed to be operable and capable of initiating closure of the MSIVs. The closure of the MSIVs is initiated to prevent the addition of steam that would lead to additional condenser pressurization and possible rupture, thereby preventing a potential radiation leakage path following an accident.

Condenser vacuum pressure signals are derived from four pressure switches that sense the pressure in the condenser. Four channels of Low Condenser Vacuum Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Setting is chosen to prevent damage to the condenser due to pressurization, thereby ensuring its integrity for offsite dose analysis. As indicated in Footnote (b) to Table 3.2.2, the channels are not required to be operable in STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel (with reactor coolant temperature >212°F) when all turbine stop valves (TSVs) and turbine bypass valves (TBVs) are closed, since the potential for condenser overpressurization is minimized. A key lock switch is provided to manually bypass the Low Condenser Vacuum Trip Function channels to enable plant

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

startup and shutdown when condenser vacuum is greater than 12 inches Hg absolute and all TSVs and TBVs are closed.

This Trip Function isolates the Group 1 valves

Primary Containment Isolation

2.a. Low Reactor Vessel Water Level

Low RPV water level indicates that the capability to cool the fuel may be threatened. The valves whose penetrations communicate with the primary containment are isolated to limit the release of fission products. The isolation of the primary containment on low RPV water level supports actions to ensure that offsite dose limits of 10 CFR 50.67 are not exceeded. The Low Reactor Vessel Water Level Trip Function associated with isolation is implicitly assumed in the UFSAR analysis as these leakage paths are assumed to be isolated post LOCA.

Low Reactor Vessel Water Level signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Low Reactor Vessel Water Level Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Low Reactor Vessel Water Level Trip Setting was chosen to be the same as the RPS Low Reactor Vessel Water Level scram Trip Setting (Specification 3.1.A), since isolation of these valves is not critical to orderly plant shutdown. The Trip Setting is referenced from the top of enriched fuel.

This Trip Function isolates the Groups 2, 3, 4, and 5 valves.

2.b. High Drywell Pressure

High drywell pressure can indicate a break in the RCPB inside the primary containment. The isolation of some of the primary containment isolation valves on high drywell pressure supports actions to ensure that offsite dose limits of 10 CFR 50.67 are not exceeded. The High Drywell Pressure Trip Function, associated with isolation of the primary containment, is implicitly assumed in the UFSAR accident analysis as these leakage paths are assumed to be isolated post LOCA.

High drywell pressure signals are initiated from pressure transmitters that sense the pressure in the drywell. Four channels of High Drywell Pressure Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Setting was selected to be the same as the ECCS High Drywell Pressure (Specification 3.2.A) and RPS High Drywell Pressure (Specification 3.1.A) Trip Settings, since this may be indicative of a LOCA inside primary containment.

This Trip Function isolates the Groups 2, 3 and 4 valves.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

High Pressure Coolant Injection System Isolation and Reactor Core Isolation Cooling System Isolation

3.a, 4.c HPCI and RCIC High Steam Line Space Temperature

High Steam Line Space Temperature Trip Functions are provided to detect a leak from the associated system steam piping. The isolation occurs when a very small leak has occurred and is diverse to the high flow instrumentation. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. These Trip Functions are not assumed in any UFSAR transient or accident analysis, since bounding analyses are performed for large breaks such as recirculation or MSL breaks. However, these instruments prevent the RCIC or HPCI steam line breaks from becoming bounding.

High Steam Line Space Temperature signals are initiated from temperature switches that are appropriately located to detect a leak from the system piping that is being monitored. For each Trip Function, there are four instruments that monitor each of three locations. Twelve channels for HPCI High Steam Line Space Temperature are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function. Twelve channels for RCIC High Steam Line Space Temperature are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Settings are set high enough above anticipated normal operating levels to avoid spurious isolation, yet low enough to provide timely detection of a HPCI or RCIC steam line break.

These Trip Functions isolate the associated Group 6 valves.

3.b., 4.d. HPCI and RCIC High Steam Line d/p (Steam Line Break)

High Steam Line d/p (Steam Line Break) Trip Functions are provided to detect a break of the RCIC or HPCI steam lines and initiate closure of the steam line isolation valves of the appropriate system. If the steam is allowed to continue flowing out of the break, the reactor will depressurize and the core can uncover. Therefore, the isolations are initiated on high d/p to prevent or minimize core damage. The isolation action, along with the scram function of the RPS, ensures that the requirements of 10 CFR 50.46 are met. Specific credit for these Trip Functions is not assumed in any UFSAR accident analyses since the bounding analysis is performed for large breaks such as recirculation and MSL breaks. However, these instruments prevent the RCIC or HPCI steam line breaks from becoming bounding.

The HPCI and RCIC High Steam Line d/p (Steam Line Break) signals are initiated from differential pressure switches (two for HPCI and two for RCIC) that are connected to the associated system steam lines. Two channels of both HPCI and RCIC High Steam Line d/p (Steam Line Break) Trip Functions are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The Trip Settings are set high enough above anticipated normal operating levels to avoid spurious isolation, yet low enough to provide timely detection of a HPCI or RCIC steam line break.

These Trip Functions isolate the associated Group 6 valves.

3.c., 4.f. HPCI and RCIC Low Steam Supply Pressure

Low steam supply 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. 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 resulting from these instruments.

The HPCI and RCIC Low Steam Supply Pressure signals are initiated from pressure switches (four for HPCI and four for RCIC) that are connected to the associated system steam line. Four channels of both HPCI and RCIC Low Steam Supply Pressure Trip Functions are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Settings are selected to be below the pressure at which the system's turbine can effectively operate.

Since these Trip Functions are provided for equipment protection, they are only required to be operable when the HPCI and RCIC System are required to be operable. Therefore, as indicated in Footnote (c) to Table 3.2.2, in STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel, the channels are only required to be operable when reactor steam pressure is > 150 psig.

These Trip Functions isolate the associated Group 6 valves.

3.d., 3.e., 4.a., 4.b. HPCI and RCIC High Main Steam Line Tunnel Temperature and Time Delay

HPCI and RCIC High Main Steam Line Tunnel Temperature Trip Functions are provided to detect a leak from the associated system steam piping. The isolation occurs when a very small leak has occurred and is diverse to the high flow instrumentation. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. These Trip Functions are not assumed in any UFSAR transient or accident analysis., since bounding analyses are performed for large breaks such as recirculation or MSL breaks. However, these instruments prevent the RCIC or HPCI steam line breaks from becoming bounding.

HPCI and RCIC High Main Steam Line Tunnel Temperature signals are initiated from temperature switches that are appropriately located to detect a leak from the associated system piping that is being monitored. For each Trip Function, there are four instruments that monitor the area. Four channels for HPCI High Main Steam Line Tunnel Temperature are available and are

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

required to be operable to ensure that no single instrument failure can preclude the isolation function. Four channels for RCIC High Main Steam Line Tunnel Temperature are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Settings are set high enough above anticipated normal operating levels to avoid spurious isolation, yet low enough to provide timely detection of a HPCI or RCIC steam line break.

These Trip Functions isolate the associated Group 6 valves.

4.e RCIC High Steam Line d/p Time Delay

The RCIC High Steam Line d/p Time Delay is provided to prevent false isolations on RCIC High Steam Line d/p during system startup transients and therefore improves system reliability. This Trip Function is not assumed in any UFSAR transient or accident analyses.

The RCIC High Steam Line d/p Time Delay Trip Function delays the RCIC High Steam Line d/p (Steam Line Break) signal by use of time delay relays. When a RCIC High Steam Line d/p (Steam Line Break) signal is generated, the time delay relays delay the tripping of the associated RCIC isolation trip system for a short time. Two channels of RCIC High Steam Line d/p Time Delay Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function.

The Trip Setting is chosen to be long enough to prevent false isolations due to system starts but not so long as to impact compliance with 10CFR50.46 requirements.

This Trip Function, in conjunction with the RCIC High Steam Line d/p (Steam Line Break) Trip Function, isolates the RCIC System Group 6 valves.

Residual Heat Removal Shutdown Cooling Isolation

5.a. High Reactor Pressure

The High Reactor Pressure Trip Function is provided to isolate the shutdown cooling portion of the Residual Heat Removal (RHR) System. This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario, and credit for the interlock is not assumed in the accident or transient analysis in the UFSAR.

The High Reactor Pressure signals are initiated from two pressure switches. Two channels of High Reactor Pressure Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function. The Trip Function is only required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel (with reactor coolant temperature >212°F), since these are the only Modes in which the reactor can be pressurized; thus, equipment protection is needed.

The Trip Setting was chosen to be low enough to protect the system equipment from overpressurization.

This Trip Function isolates the Group 4 SDC supply isolation valves.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

ACTIONS

Table 3.2.2 ACTION Note 1

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours or 24 hours, depending on the Trip Function (12 hours for those Trip Functions that have channel components common to RPS instrumentation, i.e., Trip Functions 2.a and 2.b, and 24 hours for those Trip Functions that do not have channel components common to RPS instrumentation, i.e., all other Trip Functions), has been shown to be acceptable (Refs. 6 and 7) to permit restoration of any inoperable channel to operable status. This out of service time is only acceptable provided the associated Trip Function is still maintaining isolation capability (refer to the next paragraph). For all Trip Functions except for Trip Functions 3.e, 4.b, and 4.e, if the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.2 ACTION Note 1.a.1) or 1.a.3), as applicable. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue with no further restrictions. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), the applicable actions of Table 3.2.2 ACTION Note 2 must be taken. For Trip Functions 3.e, 4.b, and 4.e, Table 3.2.2 ACTION Note 1.a.2) requires the channel to be restored to operable status. Table 3.2.2 ACTION Note 1.a.2) does not allow placing the channel in trip since this action would not necessarily result in a safe state for the channel in all events.

Table 3.2.2 ACTION Note 1.b is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in redundant automatic isolation capability being lost for the associated penetration flow path(s). The Trip Functions are considered to be maintaining isolation capability when sufficient channels are operable or in trip, such that both trip systems will generate a trip signal from the given Trip Function on a valid signal. For Trip Functions 1.a, 1.d, 1.e, 1.f, 2.a, 2.b, 3.b, 3.d, 4.a, 4.d, and 5.a, this would require both trip systems to have one channel operable or in trip. For Trip Function 1.c, this would require both trip systems to have one channel, associated with each MSL, operable or in trip. Trip Functions 1.b, 3.a and 4.c, consist of channels that monitor several locations within a given area (e.g., different locations within the main steam tunnel area). Therefore, this would require both trip systems to have one channel per location operable or in trip. For Trip Functions 3.e, 4.b and 4.e, this would require both trip systems to have one channel operable. For Trip Functions 3.c and 4.f (which only have one trip system for each Trip Function), this would require one trip system to have one channel in each trip system logic operable or in trip.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

ACTIONS (continued)

Table 3.2.2 ACTION Note 1 also allows penetration flow path(s) to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator in the immediate vicinity of the controls of the valve, with whom Control Room communication is immediately available. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

Table 3.2.2 ACTION Notes 2.a, 2.b, 2.c and 2.d

If any applicable Action and associated completion time of Table 3.2.2 ACTION Note 1.a or 1.b are not met, the applicable Actions of Table 3.2.2 ACTION Note 2 and referenced in Table 3.2.2 (as identified for each Trip Function in the Table 3.2.2 "ACTIONS REFERENCED FROM ACTION NOTE 1" column) must be immediately entered and taken. The applicable Action specified in Table 3.2.2 is Trip Function and Mode or other specified condition dependent.

For Table 3.2.2 ACTION Note 2.a, if the channel is not restored to operable status or placed in trip within the allowed Completion Time the associated MSLs may be isolated, and, if allowed (i.e., plant safety analysis allows operation with an MSL isolated), operation with that MSL isolated may continue. Isolating the affected MSL accomplishes the safety function of the inoperable channel. This action will generally only be used if a Trip Function 1.c channel is inoperable and untripped. The associated MSL(s) to be isolated are those whose High Main Steam Line Flow Trip Function channel(s) are inoperable. Alternately, the plant must be placed in a Mode or other specified condition in which the LCO does not apply. This is done by placing the plant in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 12 hours. The Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. Table 3.2.2 ACTION Note 2.a also allows penetration flow path(s) to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator in the immediate vicinity of the controls of the valve, with whom Control Room communication is immediately available. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

For Table 3.2.2 ACTION Note 2.b, if the channel is not restored to operable status or placed in trip within the allowed Completion Time, the plant must be placed in a Mode or other specified condition in which the LCO does not apply. This is done by placing the plant in COLD SHUTDOWN within 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

For Table 3.2.2 ACTION Note 2.c, if the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the plant must be placed in a Mode or other specified condition in which the LCO does not apply. This is done by placing the plant in at least STARTUP/HOT STANDBY within 8 hours. The allowed Completion Time of 8 hours is reasonable, based on operating experience, to reach STARTUP/HOT STANDBY from full power conditions in an orderly manner and without challenging plant systems.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

ACTIONS (continued)

For Table 3.2.2 ACTION Note 2.d, if the channel is not restored to operable status or placed in trip within the allowed Completion Time, plant operations may continue if the affected penetration flow path(s) is isolated. Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable channel. The 1 hour Completion Time is acceptable because it minimizes risk while allowing sufficient time for plant operations personnel to isolate the affected penetration flow path(s). Table 3.2.2 ACTION Note 2.d also allows penetration flow path(s) to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator in the immediate vicinity of the controls of the valve, with whom Control Room communication is immediately available. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.B.1

As indicated in Surveillance Requirement 4.2.B.1, primary containment isolation instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.2. Table 4.2.2 identifies, for each Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.B.1 also indicates that when a channel (and/or the affected PCIV) is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Refs. 6 and 7) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the PCIVs will isolate the penetration flow path(s) when necessary.

Surveillance Requirement 4.2.B.2

The Logic System Functional Test demonstrates the operability of the required initiation logic and simulated automatic operation for a specific channel. The automatic initiation testing required by the PCIV Technical Specifications overlaps this Surveillance to provide testing of the assumed safety function. For Main Steam Line Isolation Trip Functions, a simulated automatic actuation, which opens all pilot valves of the main steam line isolation valves, shall be performed such that each trip system logic can be verified independent of its redundant counterpart. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

SURVEILLANCE REQUIREMENTS (continued)

Table 4.2.2, Check

Performance of an Instrument Check once per day for Trip Functions 1.a, 1.c, 1.e, and 2.b, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Table 4.2.2, Functional Test

For Trip Functions 1.a, 1.b, 1.c, 1.d, 1.e, 1.f, 2.a, 2.b, 3.a, 3.b, 3.c, 3.d, 4.a, 4.c, 4.d, 4.e, 4.f, and 5.a, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of "Every 3 Months" is based on the reliability analysis of References 6 and 7.

Table 4.2.2, Calibration

For Trip Functions 1.a, 1.b, 1.c, 1.d, 1.e, 1.f, 2.a, 2.b, 3.a, 3.b, 3.c, 3.d, 3.e, 4.a, 4.b, 4.c, 4.d, 4.e, 4.f, and 5.a, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

BASES: 3.2.B/4.2.B PRIMARY CONTAINMENT ISOLATION

SURVEILLANCE REQUIREMENTS (continued)

For Trip Functions 1.a, 1.c, 1.e, 2.a, and 2.b, a calibration of the trip units is required (Footnote (a)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The Frequency of every 3 months is based on the reliability analysis of References 6 and 7 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

REFERENCES

1. Technical Requirements Manual.

2. UFSAR, Chapter 14.

3. UFSAR, Table 6.5.3.

4. UFSAR, Section 14.6.5.

5. UFSAR, Section 14.5.4.1.

6. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

7. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

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Tab 2.E

RB Ventilation Isolation and SBGT System Initiation

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

BACKGROUND

The reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation automatically initiates closure of the Reactor Building Automatic Ventilation System Isolation Valves (RBAVSIVs) and starts the Standby Gas Treatment (SGT) System. The function of these components and systems, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs) (Ref. 1). Reactor Building (i.e., secondary containment) isolation and establishment of vacuum with the SGT System ensures that fission products that leak from primary containment following a DBA, or are released outside primary containment, or are released during certain operations when primary containment is not required to be operable, are maintained within applicable limits.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of reactor building ventilation isolation and Standby Gas Treatment System operation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a reactor building ventilation isolation and Standby Gas Treatment System initiation signal to the isolation and initation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation and initiation logic are (1) reactor vessel water level, (2) drywell pressure, (3) reactor building ventilation radiation, and (4) refueling floor zone radiation. Redundant sensor input signals from each parameter are provided for initiation and isolation.

For both the Low Reactor Vessel Water Level and High Drywell Pressure Trip Functions, the reactor building ventilation isolation and Standby Gas Treatment System initiation logic receives input from four channels. The outputs of the channels are arranged in one-out-of-two taken twice logics.

For the High Reactor Building Ventilation Radiation and High Refueling Floor Zone Radiation Trip Functions, two radiation detectors and monitors are provided for each Trip Function. Each channel includes a radiation detector and associated monitor. The outputs of the channels are arranged in a one-out-of-two logic. In addition, the outputs of each channel are provided to both Trip Systems A and B. As such, any High Reactor Building Ventilation Radiation or High Refueling Floor Zone Radiation Trip Function channel will initiate reactor building ventilation isolation and Standby Gas Treatment System operation. (For the purposes of the Technical Specifications, the A radiation detectors and monitors should be considered to be associated with the Trip System A and the B radiation detectors and monitors should be considered to be associated with Trip System B.) Trip System A initiates startup of SGT subsystem A and initiates isolation of the reactor building supply and exhaust outboard isolation valves. Trip System B initiates startup of SGT subsystem B and initiates isolation of the reactor building supply and exhaust inboard isolation valves. As such, either Trip System isolates the secondary containment and provides the necessary filtration of fission products.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The isolation and initiation signals generated by the reactor building ventilation isolation and Standby Gas Treatment System initiation

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

instrumentation are implicitly assumed in the safety analyses of References 2, 3, and 4, to initiate closure of the RBAVSIVs and start the SGT System to limit offsite doses.

Reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

The operability of the reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions specified in Table 3.2.3. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.3. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

In general, the individual Trip Functions are required to be OPERABLE in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel (with reactor coolant temperature > 212°F), during operations with the potential for draining the reactor vessel (OPDRVs), during movement of irradiated fuel assemblies or fuel cask in secondary containment, and during Alteration of the Reactor Core; consistent with the Applicability for the SGT System and secondary containment requirements in Specifications 3.7.B and 3.7.C. Trip Functions that have different Applicabilities are discussed below in the individual Trip Functions discussion.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Trip Function by Trip Function basis.

1. Low Reactor Vessel Water Level

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite release. The Low Reactor Vessel Water Level Trip Function is one of the Trip Functions assumed to be operable and capable of providing isolation and initiation signals. The isolation and initiation of systems on Low Reactor Vessel Water Level support actions to ensure that any offsite releases are within the limits calculated in the safety analysis.

Low Reactor Vessel Water Level signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Low Reactor Vessel Water Level Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation and initiation function.

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The Low Reactor Vessel Water Level Trip Setting was chosen to be the same as the Reactor Protection System (RPS) Low Reactor Vessel Water Level Trip Setting (Specification 3.1.A), since this could indicate that the capability to cool the fuel is being threatened. The Trip Setting is referenced from the top of enriched fuel.

The Low Reactor Vessel Water Level Trip Function is required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel (with reactor coolant temperature > 212°F) where considerable energy exists in the Reactor Coolant System (RCS); thus, there is a possibility of pipe breaks resulting in significant releases of radioactive steam and gas. In COLD SHUTDOWN and Refuel (with reactor coolant temperature $\leq$ 212°F), the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these Modes; thus, this Trip Function is not required. In addition, the Trip Function is also required to be operable during OPDRVs to ensure that offsite dose limits are not exceeded if core damage occurs.

2. High Drywell Pressure

High drywell pressure can indicate a break in the reactor coolant pressure boundary (RCPB). An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite release. The isolation and initiation of systems on High Drywell Pressure supports actions to ensure that any offsite releases are within the limits calculated in the safety analysis.

High drywell pressure signals are initiated from pressure transmitters that sense the pressure in the drywell. Four channels of High Drywell Pressure Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude performance of the isolation and initiation function.

The Trip Setting was chosen to be the same as the RPS High Drywell Pressure Trip Setting (Specification 3.1.A) since this is indicative of a loss of coolant accident (LOCA).

The High Drywell Pressure Trip Function is required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel (with reactor coolant temperature > 212°F) where considerable energy exists in the RCS; thus, there is a possibility of pipe breaks resulting in significant releases of radioactive steam and gas. This Trip Function is not required in COLD SHUTDOWN and Refuel (with reactor coolant temperature $\leq$ 212°F) because the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these Modes.

3, 4. High Reactor Building Ventilation Radiation and High Refueling Floor Zone Radiation

High reactor building ventilation radiation or refuel floor zone radiation is an indication of possible gross failure of the fuel cladding. The release may

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

have originated from the primary containment due to a break in the RCPB or the refueling floor due to a fuel handling accident. When High Reactor Building Ventilation Radiation or High Refueling Floor Zone Radiation is detected, secondary containment isolation and actuation of the SGT System are initiated to support actions to limit the release of fission products as assumed in the UFSAR safety analyses (Ref. 4).

The High Reactor Building Ventilation Radiation and High Refueling Floor Zone Radiation signals are initiated from radiation detectors that are located on the ventilation exhaust duct coming from the reactor building and the refueling floor zones, respectively. Two channels of High Reactor Building Ventilation Radiation Trip Function and two channels of High Refueling Floor Radiation Trip Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation and initiation function.

The Trip Settings are chosen to promptly detect gross failure of the fuel cladding.

The High Reactor Building Ventilation Radiation and High Refueling Floor Zone Radiation Trip Functions are required to be operable in RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel (with reactor coolant temperature > 212°F) where considerable energy exists in the RCS; thus, there is a possibility of pipe breaks resulting in significant releases of radioactive steam and gas. In COLD SHUTDOWN and Refuel (with reactor coolant temperature ≤ 212°F), the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these Modes; thus, these Trip Functions are not required. In addition, the Trip Functions are also required to be operable during OPDRVs, during movement of irradiated fuel assemblies or fuel cask in the secondary containment, and during Alteration of the Reactor Core, because the capability of detecting radiation releases due to fuel failures (due to fuel uncovery or dropped fuel assemblies) must be provided to ensure that offsite dose limits are not exceeded.

ACTIONS

Table 3.2.3 ACTION Note 1

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours or 24 hours depending on the Trip Function (12 hours for those Trip Functions that have channel components common to RPS instrumentation, i.e., Trip Functions 1 and 2, and 24 hours for those Trip Functions that do not have channel components common to RPS instrumentation, i.e., all other Trip Functions), has been shown to be acceptable (Refs. 5 and 6) to permit restoration of any inoperable channel to operable status. This out of service time is only acceptable provided the associated Trip Function is still maintaining isolation capability (refer to next paragraph). If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.3 Note 1.a.1) or 1.a.2), as applicable. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately,

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

ACTIONS (continued)

if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation or initiation), the Reactor Building Ventilation System must be isolated and the SGT System must be placed in operation within the next one hour. Isolating the Reactor Building Ventilation System and placing the SGT System in operation performs the intended function of the instrumentation and allows operation to continue.

Table 3.2.3 Note 1.b is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in a complete loss of isolation capability for the associated penetration flow path(s) or a complete loss of initiation capability for the SGT System. A Trip Function is considered to be maintaining isolation and initiation capability when sufficient channels are operable or in trip in both trip systems, such that a trip signal will be generated from the given Trip Function on a valid signal. This ensures that isolation of the two RBAVSIVs in the associated penetration flow path and the operation of the SGT System can be initiated on an isolation and initiation signal from the given Trip Function. For the Trip Functions 1 and 2, this would require each trip system to have one channel operable or in trip. For Trip Functions 3 and 4, this would require one channel to be operable or in trip. The one hour Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

If any applicable Action and associated Completion Time of Table 3.2.3 ACTION Note 1.a or 1.b are not met, the ability to isolate the secondary containment and start the SGT System cannot be ensured. Therefore, further actions must be performed to ensure the ability to maintain the secondary containment isolation and SGT System initiation function. Isolating the associated penetration flow path(s) and starting the associated SGT System within the next one hour performs the intended function of the instrumentation and allows operation to continue. One hour is sufficient for plant operations personnel to establish required plant conditions or to declare the associated components inoperable without unnecessarily challenging plant systems.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.C.1

As indicated in Surveillance Requirement 4.2.C.1, reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.3. Table 4.2.3 identifies, for each Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.C.1 also indicates that when a channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains isolation and

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

SURVEILLANCE REQUIREMENTS (continued)

initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RBAVSIVs will isolate the penetration flow path(s) and that the SGT System will initiate when necessary.

Surveillance Requirement 4.2.C.2

The Logic System Functional Test demonstrates the operability of the required initiation logic and simulated automatic operation for a specific channel. The testing required by the SGT System and RBAVSIVs Technical Specifications overlaps this Surveillance to provide testing of the assumed safety function. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.2.3, Check

Performance of an Instrument Check once per day, for Trip Function 3, and once per day during Refueling, for Trip Function 4, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Table 4.2.3, Functional Test

For Trip Functions 1, 2, 3, and 4, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current

BASES: 3.2.C/4.2.C REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION

SURVEILLANCE REQUIREMENTS (continued)

plant specific setpoint methodology. The Frequency of "Every 3 Months" is based on the reliability analysis of References 5 and 6.

Table 4.2.3, Calibration

For Trip Functions 1, 2, 3, and 4, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

For Trip Functions 1 and 2, a calibration of the trip units is required (Footnote (a)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The Frequency of every 3 months is based on the reliability analysis of Reference 6 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

REFERENCES

1. UFSAR, Section 5.3.
2. UFSAR, Section 7.17.2.
3. UFSAR, Section 14.6.3.6.
4. UFSAR, Section 14.6.4.4.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

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Tab 2.F

Control Rod Block Actuation

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

BACKGROUND

Control rods provide the primary means for control of reactivity changes. Control rod block instrumentation includes channel sensors, logic circuitry, switches, and relays that are designed to backup administrative controls on control rod movement. During shutdown conditions, control rod blocks from the Reactor Mode Switch—Shutdown Position Function ensure that all control rods remain inserted to prevent inadvertent criticalities.

The purpose of the RBM (Ref.1) is to limit control rod withdrawal if localized neutron flux exceeds a predetermined setpoint during control rod manipulations. The RBM supplies a trip signal to the Reactor Manual Control System (RMCS) to appropriately inhibit control rod withdrawal during power operation above the 30% RATED THERMAL POWER setpoint when a non-peripheral control rod (except control rod 35-34) is selected. The RBM has two channels, either of which can initiate a control rod block when the channel output exceeds the control rod block setpoint. One RBM channel inputs into one RMCS rod block circuit and the other RBM channel inputs into the second RMCS rod block circuit. A rod block in either RMCS circuit will provide a control rod block to all control rods. The RBM channel signal is generated by averaging a set of local power range monitor (LPRM) signals. One RBM channel averages the signals from LPRM detectors at the A and C positions in the assigned LPRM assemblies, while the other RBM channel averages the signals from LPRM detectors at the B and D positions. Assignment of LPRMs to be used in RBM averaging is controlled by the selection of control rods. The RBM is automatically bypassed and the output set to zero if a peripheral rod (or control rod 35-34) is selected or the APRM used to normalize the RBM reading is at < 30% RATED THERMAL POWER. If any LPRM detector assigned to an RBM is bypassed, the computed average signal is automatically adjusted to compensate for the number of LPRM input signals. The minimum number of LPRM inputs required for each RBM channel to prevent an instrument inoperative trip is four when using four LPRM strings, three when using three LPRM strings, and two when using two LPRM strings. Each RBM also receives a recirculation loop flow signal from the associated flow converter.

When a control rod is selected, the gain of each RBM channel output is normalized to a reference APRM. The gain setting is held constant during the movement of that particular control rod to provide an indication of the change in the relative local power level. If the indicated power increases above the preset limit, a rod block will occur. In addition, to preclude rod movement with an inoperable RBM, a downscale trip and an inoperable trip are provided.

With the reactor mode switch in the shutdown position, a control rod withdrawal block is applied to all control rods to ensure that the shutdown condition is maintained (Ref. 2). This Trip Function prevents inadvertent criticality as the result of a control rod withdrawal during COLD SHUTDOWN and HOT SHUTDOWN or during a Refueling Outage when the reactor mode switch is required to be in the shutdown position. The reactor mode switch has two channels, each inputting into a separate RMCS rod block circuit. A rod block in either RMCS circuit will provide a control rod block to all control rods.

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a, 1.b, 1.c Rod Block Monitor

The RBM is not specifically credited in any accident or transient analysis, but it is retained for overall redundancy and diversity as required by the NRC approved licensing basis. The Trip Settings are based on providing operational flexibility in the MELLLA region.

Two channels of each of the RBM Trip Functions are required to be operable, with their trip setpoints within the calculational as-found tolerances specified in plant procedures, as applicable, to ensure that no single instrument failure can preclude a rod block from these Trip Functions. In addition, to provide adequate coverage of the entire core in the axial direction, LPRM inputs for each RBM channel are required from greater than or equal to half the total number of inputs from any LPRM level for every non-peripheral control rod selected for movement. The upper limit of the RBM Upscale (Flow Bias) Trip Function is clamped to provide protection at greater than 100% rated core flow. This clamped value is cycle-specific and is included in the Core Operating Limits Report. Trip Settings are specified for RBM Upscale (Flow Bias) and RBM Downscale Trip Functions. The terms for the Trip Setting of the RBM Upscale (Flow Bias) Trip Function are defined as follows: W is percent of rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 X 10^6 lbs/hr core flow; and ΔW is the difference between two loop and single loop drive flow at the same core flow (this difference must be accounted for during single loop operation). $\Delta W = 0$ for two loop operation and $\Delta W = 8\%$ for single loop operation.

Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.5. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2. Reactor Mode Switch – Shutdown Position

During HOT SHUTDOWN and COLD SHUTDOWN, and during Refueling Outages when the reactor mode switch is in the shutdown position, the core is assumed to be subcritical; therefore, no positive reactivity insertion events are analyzed. The Reactor Mode Switch–Shutdown Position control rod withdrawal block ensures that the reactor remains subcritical by blocking control rod withdrawal, thereby preserving the assumptions of the safety analysis.

The Reactor Mode Switch–Shutdown Position Trip Function satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

Two channels are required to be operable to ensure that no single channel failure will preclude a rod block when required. There is no Trip Setting for this Trip Function since the channels are mechanically actuated based solely on reactor mode switch position. During shutdown conditions (HOT SHUTDOWN and COLD SHUTDOWN, and Refueling Outages when the reactor mode switch is in the shutdown position), no positive reactivity insertion events are analyzed because assumptions are that control rod withdrawal blocks are provided to prevent criticality. Therefore, when the reactor mode switch is in the shutdown position, the control rod withdrawal block is required to be operable. With the reactor mode switch in the refueling position, the refuel position one-rod-out interlock provides the required control rod withdrawal blocks.

ACTIONS

Table 3.2.5 ACTION Note 1

With one RBM Trip Function 1.a, 1.b, or 1.c channel inoperable, the remaining operable channel is adequate to perform the control rod block function; however, overall reliability is reduced because a single failure in the remaining operable RBM channel can result in no control rod block capability for the RBM. For this reason, Table 3.2.5 ACTION Note 1.a requires restoration of the inoperable channel to operable status. The Completion Time of 24 hours is based on the low probability of an event occurring coincident with a failure in the remaining operable channel.

If the Table 3.2.5 ACTION Note 1.a required action is not met and the associated Completion Time has expired, the inoperable channel must be placed in trip within 1 hour. If both RBM Trip Function 1.a, 1.b, or 1.c channels are inoperable, the RBM is not capable of performing its intended function; thus, one channel must also be placed in trip. This initiates a control rod withdrawal block, thereby ensuring that the RBM function is met. The 1 hour Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities and is acceptable because it minimizes risk while allowing time for restoration or tripping of inoperable channels.

Table 3.2.5 ACTION Note 2

With one Reactor Mode Switch–Shutdown Position control rod withdrawal block channel inoperable, the remaining operable channel is adequate to perform the

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

ACTIONS (continued)

control rod withdrawal block function. However, since the required actions of Table 3.2.5 ACTION Note 2 are consistent with the normal action of an operable Reactor Mode Switch—Shutdown Position Trip Function (i.e., maintaining all control rods inserted), there is no distinction between having one or two channels inoperable.

In both cases (one or both channels inoperable), suspending all control rod withdrawal and initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies will ensure that the core is subcritical with adequate Shutdown Margin ensured by Specification 3.3.A.1. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and are therefore not required to be inserted. Action must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.E.1

As indicated in Surveillance Requirement 4.2.E.1, control rod block instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.5. Table 4.2.5 identifies, for each Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.E.1 also indicates that when an RBM channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains control rod block capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Ref. 4) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary.

Table 4.2.5, Functional Test

For Trip Functions 1.a, 1.b, and 1.c, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. The Functional Test of the RBM channels includes the Reactor Manual Control "Select Relay Matrix" System input. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of "Every 3 Months" is based on the reliability analysis of Reference 5.

For Trip Function 2, a Functional Test is performed to ensure that the entire channel will perform the intended function. The Functional Test for the Reactor Mode Switch—Shutdown Position Trip Function is performed by attempting to withdraw any control rod with the reactor mode switch in the

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

SURVEILLANCE REQUIREMENTS (continued)

shutdown position and verifying a control rod block occurs. As noted in Table 4.2.5 Footnote (a), the Surveillance must be completed within 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable links. This allows entry into the HOT SHUTDOWN and COLD SHUTDOWN Modes if the "Every Refueling Outage" Frequency is not met. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the Surveillance Requirement. The Frequency of "Every Refueling Outage" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.2.5, Calibration

For Trip Functions 1.a and 1.b, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

The RBM is automatically bypassed when power is below a specified value or if a peripheral control rod is selected. The power level is determined from the APRM signals input to each RBM channel. The automatic bypass setpoint must be verified periodically to be ≤ 30% RATED THERMAL POWER. As a result, the Instrument Calibration of Trip Function 1.a must also include calibration of the RBM Reference Downscale function (i.e., RBM Upscale (Flow Bias) Trip Function is not bypassed when > 30% RATED THERMAL POWER), as noted in Footnote (c). In addition, it must also be verified that the RBM is not bypassed when a control rod that is not a peripheral control rod is selected (only one non-peripheral control rod is required to be verified). If any bypass setpoint is nonconservative, then the affected RBM channel is considered inoperable. Alternatively, the APRM channel can be placed in the conservative condition to enable the RBM. If placed in this condition, the Surveillance Requirement is met and the RBM channel is not considered inoperable.

As noted in Footnote (b), neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day heat balance calibration and the 2000 MWD/T LPRM calibration against the Traversing Incore Probe System of the Reactor Protection System Technical Specification.

BASES: 3.2.E/4.2.E CONTROL ROD BLOCK ACTUATION

REFERENCES

1. UFSAR, Section 7.5.8.

2. UFSAR, Section 7.7.4.3.2.

3. UFSAR, Section 14.5.3.1.

4. GENE-770-06-1-A, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

5. NEDC-30851-P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

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Tab 2.G

Mechanical Vacuum Pump Isolation

BASES: 3.2.F/4.2.F MECHANICAL VACUUM PUMP ISOLATION

BACKGROUND

The mechanical vacuum pump isolation instrumentation initiates an isolation of the mechanical vacuum pump following events in which main steam radiation monitors exceed a predetermined value. Tripping and isolating the mechanical vacuum pumps limits control room and offsite doses in the event of a control rod drop accident (CRDA).

The mechanical vacuum pump isolation instrumentation includes sensors, relays and switches that are necessary to cause initiation of mechanical vacuum pump isolation. The channels include electronic equipment that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs an isolation signal to the mechanical vacuum pump isolation logic.

The isolation logic consists of two independent trip systems, with two channels of the High Main Steam Line Radiation Trip Function in each trip system. Each trip system is a one-out-of-two logic for this Trip Function. Thus, either channel of the High Main Steam Line Radiation Trip Function in a trip system is needed to trip the trip system. The outputs of the channels in a trip system are arranged in a logic so that both trip systems must trip to result in an isolation signal.

The mechanical vacuum pump isolation valve is also associated with this Trip Function.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The mechanical vacuum pump isolation is assumed in the safety analysis for the CRDA. The mechanical vacuum pump isolation instrumentation initiates an isolation of the mechanical vacuum pump to limit control room and offsite doses resulting from fuel cladding failure in a CRDA.

The mechanical vacuum pump isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

The operability of the mechanical vacuum pump isolation instrumentation is dependent on the operability of the four High Main Steam Line Radiation Trip Function instrumentation channels with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Surveillance Requirement 4.2.F.1.c as required by the CRDA analysis. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions. The High Main Steam Line Radiation Trip Setting was chosen to be as low enough to ensure that control room and offsite dose limits are not exceeded in the event of a CRDA, but high enough to avoid spurious isolation due to nitrogen-16 spikes, instrument instabilities, and other operational occurrences. Channel operability also includes the mechanical vacuum pump isolation valve.

BASES: 3.2.F/4.2.F MECHANICAL VACUUM PUMP ISOLATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The mechanical vacuum pump isolation is required to be operable in RUN and STARTUP/HOT STANDBY when the mechanical vacuum pump is in service to mitigate the consequences of a postulated CRDA. In this condition, fission products released during a CRDA could be discharged directly to the environment. Therefore, the mechanical vacuum pump isolation is necessary to assure conformance with the radiological evaluation of the CRDA. In other Modes or conditions, the consequences of a control rod drop are insignificant, and are not expected to result in any fuel damage or fission product releases. When the mechanical vacuum pump is not in operation in RUN and STARTUP/HOT STANDBY, fission product releases via this pathway would not occur.

ACTIONS

Specification 3.2.F.2.a

With one or more High Main Steam Line Radiation Trip Function channels inoperable, but with mechanical vacuum pump isolation capability maintained (refer to Specification 3.2.F.2.b Bases), the mechanical vacuum pump isolation instrumentation is capable of performing the intended function. However, the reliability and redundancy of the mechanical vacuum pump isolation instrumentation is reduced, such that a single failure in one of the remaining channels could result in the inability of the mechanical vacuum pump isolation instrumentation to perform the intended function. Therefore, only a limited time is allowed to restore the inoperable channels to operable status. Because of the low probability of an extensive number of inoperabilities affecting multiple channels, and the low probability of an event requiring the initiation of mechanical vacuum pump isolation, 12 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to operable status. Alternately, the inoperable channel or associated trip system may be placed in trip, since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. As noted, placing the channel in trip with no further restrictions is not allowed if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve, since this may not adequately compensate for the inoperable mechanical vacuum pump isolation valve (e.g., the isolation valve may be inoperable such that it will not close). If it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel would result in loss of condenser vacuum), or if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve, Specification 3.2.F.2.b must be entered and its required actions taken.

Specification 3.2.F.2.b

With any required Action and associated completion time of Specification 3.2.F.2.a not met, the plant must be brought to a Mode or other specified condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least SHUTDOWN within 12 hours. Alternately, the mechanical vacuum pump may be isolated since this performs the intended function of the instrumentation. An additional option is provided to isolate

BASES: 3.2.F/4.2.F MECHANICAL VACUUM PUMP ISOLATION

ACTIONS (continued)

the main steam lines, which may allow operation to continue. Isolating the main steam lines effectively provides an equivalent level of protection by precluding fission product transport to the condenser. This isolation is accomplished by isolation of all main steam lines and main steam line drains which bypass the main steam isolation valves.

Specification 3.2.F.2.b is also intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels result in the High Main Steam Line Radiation Trip Function not maintaining mechanical vacuum pump isolation capability. The High Main Steam Line Radiation Trip Function is considered to be maintaining mechanical vacuum pump isolation capability when sufficient channels are operable or in trip such that the mechanical vacuum pump isolation instruments will generate a trip signal from a valid High Main Steam Line Radiation signal, and the mechanical vacuum pump will be isolated. This requires one channel of the High Main Steam Line Radiation Trip Function in each trip system to be operable or in trip, and the mechanical vacuum pump isolation valve to be operable.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.F.1

As indicated in Surveillance Requirement 4.2.F.1, the High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be checked, functionally tested and calibrated as indicated Surveillance Requirements 4.2.F.1.a, b, c, d, and e.

Surveillance Requirement 4.2.F.1 also indicates that when a channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains mechanical vacuum pump isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a mechanical vacuum pump will isolate when necessary.

Surveillance Requirement 4.2.F.1.a, Instrument Check

Performance of an Instrument Check once each day ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based

BASES: 3.2.F/4.2.F MECHANICAL VACUUM PUMP ISOLATION

SURVEILLANCE REQUIREMENTS (continued)

on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Surveillance Requirement 4.2.F.1.b, Instrument Functional Test

An Instrument Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of "once every 3 months" is based on the reliability analysis of Reference 1.

Surveillance Requirements 4.2.F.1.c and 4.2.F.1.d, Instrument Calibrations

An Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. Surveillance Requirement 4.2.F.1.c requires a calibration to be performed once every 3 months using a current source. This current source is provided downstream of the radiation detectors. As such, the radiation detectors are excluded from the 3 month calibration. Surveillance Requirement 4.2.F.1.d requires a calibration to be performed once each Refueling Outage using a radiation source. The radiation detectors are included in the once each Refueling Outage calibration. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

Surveillance Requirement 4.2.F.1.e, Logic System Functional Test

The Logic System Functional Test demonstrates the operability of the required trip logic for a specific channel. Actuation of the mechanical vacuum pump isolation valve is included as part of this Surveillance to provide complete testing of the assumed safety function. Therefore, if the isolation valve is incapable of actuating, the instrument channel would be inoperable. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

BASES: 3.2.F/4.2.F MECHANICAL VACUUM PUMP ISOLATION

REFERENCES

1. NEDC-30851P-A, Supplement 2, Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation, March 1989.

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Tab 2.H

Post-Accident Monitoring Instrumentation

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

BACKGROUND

The primary purpose of the post-accident monitoring (PAM) instrumentation is to display, in the control room, plant variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for Design Basis Events. The instruments that monitor these variables are designated as Type A, Category I, and non-Type A, Category I, in accordance with Regulatory Guide 1.97 (Ref. 1).

The operability of the post-accident monitoring instrumentation ensures that there is sufficient information available on selected plant parameters to monitor and assess plant status and behavior following an accident. This capability is consistent with the recommendations of Reference 1.

APPLICABLE SAFETY ANALYSES

The PAM instrumentation Specification ensures the operability of Regulatory Guide 1.97, Type A variables so that the control room operating staff can:

- Perform the diagnosis specified in the Emergency Operating Procedures (EOPs). These variables are restricted to preplanned actions for the primary success path of Design Basis Accidents (DBAs), (e.g., loss of coolant accident (LOCA)), and
- Take the specified, preplanned, manually controlled actions for which no automatic control is provided, which are required for safety systems to accomplish their safety function.

The PAM instrumentation Specification also ensures operability of most Category I, non-Type A, variables so that the control room operating staff can:

- Determine whether systems important to safety are performing their intended functions;
- Determine the potential for causing a gross breach of the barriers to radioactivity release;
- Determine whether a gross breach of a barrier has occurred; and
- Initiate action necessary to protect the public and for an estimate of the magnitude of any impending threat.

The plant specific Regulatory Guide 1.97 analysis (Ref. 2) documents the process that identified Type A and Category I, non-Type A, variables.

Post-accident monitoring instrumentation that satisfies the definition of Type A in Regulatory Guide 1.97 meets Criterion 3 of 10 CFR 50.36(c)(2)(ii). Category I, non-Type A, instrumentation is retained in Technical Specifications (TS) because they are intended to assist operators in

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

APPLICABLE SAFETY ANALYSES (continued)

minimizing the consequences of accidents. Therefore, these Category I variables are important for reducing public risk.

LCO

Specification 3.2.G and Table 3.2.6 require two operable channels for each Function to ensure that no single failure prevents the operators from being presented with the information necessary to determine the status of the plant and to bring the plant to, and maintain it in, a safe condition following an accident. Furthermore, providing two channels allows an Instrument Check during the post accident phase to confirm the validity of displayed information.

The following list is a discussion of the specified instrument Functions listed in Table 3.2.6.

1. Drywell Atmospheric Temperature

Drywell atmospheric temperature is a Type A and Category I variable provided to detect a reactor coolant pressure boundary (RCPB) breach and to verify the effectiveness of Emergency Core Cooling System (ECCS) functions that operate to maintain containment integrity. Two redundant temperature signals are transmitted from separate temperature elements for each channel. The output of one of these channels is recorded on a recorder in a control room. The output of the other channel is displayed on an indicator in the control room. The drywell atmospheric temperature channels measure from 0°F to 350°F. Therefore, the PAM Specification deals specifically with this portion of the instrument channels.

2. Drywell Pressure

Drywell pressure is a Type A and Category I variable provided to detect breach of the RCPB and to verify ECCS functions that operate to maintain Reactor Coolant System (RCS) integrity. Two drywell pressure signals are transmitted from separate pressure transmitters for each channel. The output of these channels is displayed on two independent indicators in the control room. The pressure channels measure from -15 psig to 260 psig. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

3. Torus Pressure

Torus pressure is a Type A and Category I variable provided to detect a condition that could potentially lead to containment breach and to verify the effectiveness of ECCS actions taken to prevent containment breach. Two torus pressure signals are transmitted from separate pressure transmitters and displayed on two independent indicators in the control room. The range of

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

LCO (continued)

indication is - 15 psig to 85 psig. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

4. Torus Water Level

Torus water level is a Type A and Category I variable provided to detect a breach in the RCPB. This variable is also used to verify and provide long term surveillance of ECCS function. The Torus Water Level Function provides the operator with sufficient information to assess the status of both the RCPB and the water supply to the ECCS. The Torus Water Level Function channels monitor the torus water level from 0-25 feet referenced to the bottom of the torus. Two torus water level signals are transmitted from separate level transmitters to two independent control room indicators in the control room. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

5. Torus Water Temperature

Torus water temperature is a Type A and Category I variable provided to detect a condition that could potentially lead to containment breach and to verify the effectiveness of ECCS actions taken to prevent containment breach. Two redundant temperature signals are transmitted from separate temperature elements for each channel. The temperature channels output to two independent control room indicators. The range of the torus water temperature channels is 0°F to 250°F. Therefore, the PAM Specification deals specifically with this portion of the instrument channels.

6. Reactor Pressure

Reactor pressure is a Type A and Category I variable provided to support monitoring of RCS integrity and to verify operation of the ECCS. Two independent pressure transmitters, with a range of 0 psig to 1500 psig, monitor pressure and provide pressure indication to the control room. The output from these channels is provided to two independent indicators in the control room. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

7. Reactor Vessel Water Level

Reactor vessel water level is a Type A and Category I variable provided to support monitoring of core cooling and to verify operation of the ECCS. Water level is measured by independent differential pressure transmitters for each channel. Each channel measures from -200 inches to + 200 inches, referenced to the top of enriched fuel. The output from these channels is provided to two independent indicators in the control room. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

LCO (continued)

8. Torus Air Temperature

Torus air temperature is a Type A and Category I variable provided to detect a RCPB breach and to verify the effectiveness of ECCS functions that operate to maintain containment integrity. Two redundant temperature signals are transmitted from separate temperature elements for each channel. The output of one of these channels is recorded on a recorder in a control room with a range of 50°F to 300°F. The output of the other channel is displayed on an indicator in the control room with a range of 0°F to 350°F. Therefore, the PAM Specification deals specifically with this portion of the instrument channels.

9. Containment High Range Radiation Monitor

Containment high range radiation is a Category 1 variable provided to monitor the potential of significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. Two redundant radiation detectors are mounted in the drywell. Each radiation detector provides a signal to an independent monitor in the control room, which has a range from 10^0 R/hr to 10^7 R/hr. The outputs of these radiation monitors are displayed on two independent indicators located in the control room. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

APPLICABILITY

The PAM instrumentation Specification is applicable in the RUN and STARTUP/HOT STANDBY Modes. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in the RUN and STARTUP/HOT STANDBY Modes. In other Modes and conditions, plant conditions are such that the likelihood of an event that would require PAM instrumentation is extremely low; therefore, PAM instrumentation is not required to be operable in these other Modes or conditions.

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

ACTIONS

Table 3.2.6 ACTION Note 1

Table 3.2.6 ACTION Note 1.a.1) requires that, when one or more Functions (except Function 9) have one required channel that is inoperable, the required inoperable channel must be restored to operable status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining operable channels, the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval. If the inoperable channel of each affected Function has not been restored to operable status in 30 days, Table 3.2.6 ACTION Note 1.a.2) requires a special written report be submitted to the NRC within the next 14 days. The report will outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation to operable status. This action is appropriate in lieu of a shutdown requirement, since another operable channel is monitoring the Function, an alternate method of monitoring is available, and given the likelihood of plant conditions that would require information provided by this instrumentation.

Table 3.2.6 ACTION Note 1.b.1) requires that, when one or more Functions, except Function 9, have two required channels that are inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to operable status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur. If at least one channel of each affected Function has not been restored to operable status in 7 days, Table 3.2.6 ACTION Note 1.b.2) requires the plant to be brought to a Mode in which the LCO does not apply. To achieve this status, the plant must be brought to at least HOT SHUTDOWN within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Table 3.2.6 ACTION Note 2

Table 3.2.6 ACTION Note 2.a.1) requires that, when Function 9 has one required channel that is inoperable, the required inoperable channel must be restored to operable status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining operable channels, the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval. If the inoperable channel has not been restored to operable status in 30 days, Table 3.2.6 ACTION Note 2.a.2) requires a special written report be submitted to the NRC within the next 14 days. The report will outline the preplanned alternate

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

ACTIONS (continued)

method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation to operable status. This action is appropriate in lieu of a shutdown requirement, since another operable channel is monitoring the Function, an alternate method of monitoring is available, and given the likelihood of plant conditions that would require information provided by this instrumentation.

Table 3.2.6 ACTION Note 2.b.1) requires that, when Function 9 has two required channels that are inoperable, one channel should be restored to operable status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

Since alternate means of monitoring drywell radiation have been developed and tested, the action required by Table 3.2.6 ACTION 2.b.2), if at least one channel has not been restored to operable status within 7 days, is not to shut down the plant, but rather to submit a special written report to the NRC within the next 14 days. The report will outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the normal PAM instrumentation to operable status. The alternate means of monitoring may be temporarily installed if the normal PAM channel cannot be restored to operable status within the allotted time. The report provided to the NRC should also describe the degree to which the alternate means are equivalent to the installed PAM channels and justify the areas in which they are not equivalent.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.G.1

As indicated in Surveillance Requirement 4.2.G.1, post-accident monitoring instrumentation shall be checked and calibrated as indicated in Table 4.2.6. Table 4.2.6 identifies, for each Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.G.1 also indicates that when a channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. The 6 hour testing allowance is acceptable since it does not significantly reduce the probability of properly monitoring post-accident parameters, when necessary.

BASES: 3.2.G/4.2.G POST-ACCIDENT MONITORING INSTRUMENTATION

SURVEILLANCE REQUIREMENTS (continued)

Table 4.2.6, Check

Performance of an Instrument Check once each day ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Table 4.2.6, Calibration

An Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. The specified Instrument Calibration Frequencies are based on operating experience.

REFERENCES

1. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 3, May 1983.

2. NRC letter, M.B. Fairtile (NRC) to L.A. Tremblay (VYNPC), "Conformance to Regulatory Guide 1.97 for Vermont Yankee Nuclear Power Station," December 4, 1990.

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Tab 2.I

Recirculation Pump Trip Instrumentation

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

BACKGROUND

The Anticipated Transient Without Scram (ATWS) Prevention/Mitigation System initiates a Recirculation Pump Trip (RPT), adding negative reactivity, following events in which a scram does not but should occur, to lessen the effects of an ATWS event. Tripping the recirculation pumps adds negative reactivity from the increase in steam voiding in the core area as core flow decreases. When Low - Low Reactor Vessel Water Level or High Reactor Pressure setpoint is reached, the reactor recirculation motor generator (RRMG) field breakers trip.

The RPT Instrumentation (Ref. 1) of the ATWS Prevention/Mitigation System includes sensors, relays, and switches that are necessary to cause initiation of an RPT. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs an RPT signal to the trip logic.

The RPT Instrumentation consists of two independent and identical trip systems (A and B), with two channels of High Reactor Pressure and two channels of Low - Low Reactor Vessel Water Level in each trip system. Each RPT Instrumentation trip system is a two-out-of-two logic for each Trip Function. Thus, either two Low - Low Reactor Water Level or two High Reactor Pressure signals will trip a trip system. In addition, a combination of one Low - Low Reactor Vessel Water Level signal and one High Reactor Pressure signal (in the same trip system) will trip the trip system. The outputs of the channels in a trip system are combined in a logic so that either trip system will trip both recirculation pumps (by tripping the respective RRMG field breakers). Each Low - Low Reactor Vessel Water Level channel output must remain below the setpoint for approximately 10 seconds for the channel output to provide an actuation signal to the associated trip system.

There is one RRMG field breaker provided for each of the two recirculation pumps for a total of two breakers. The output of each trip system is provided to both RRMG field breakers.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RPT Instrumentation is not assumed to mitigate any accident or transient in the safety analysis. The RPT Instrumentation initiates an RPT to aid in preserving the integrity of the fuel cladding following events in which a scram does not, but should, occur. Based on its contribution to the reduction of overall plant risk, however, the instrumentation meets Criterion 4 of 10 CFR 50.36(c)(2)(ii).

The operability of the RPT Instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Trip Settings specified in Table 3.2.7. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions. Channel operability also includes the associated recirculation pump trip breakers (i.e., RRMG field breakers).

The individual Trip Functions are required to be operable in the RUN Mode to protect against common mode failures of the Reactor Protection System by providing a diverse trip to mitigate the consequences of a postulated ATWS event. The High Reactor Pressure and Low - Low Reactor Vessel Water Level Trip Functions are required to be operable in the RUN Mode, since the reactor is producing significant power and the recirculation system could be at high flow. During this Mode, the potential exists for pressure increases or low water level, assuming an ATWS event. In the STARTUP/HOT STANDBY Mode, the reactor is at low power and the recirculation system is at low flow; thus, the potential is low for a pressure increase or low water level, assuming an ATWS event. Therefore, the RPT Instrumentation is not necessary. In HOT SHUTDOWN and COLD SHUTDOWN, the reactor is shut down with all control rods inserted; thus, an ATWS event is not significant and the possibility of a significant pressure increase or low water level is negligible. In Refuel, the one rod out interlock ensures that the reactor remains subcritical; thus, an ATWS event is not significant.

The specific Applicable Safety Analyses and LCO discussions are listed below on a Trip Function by Trip Function basis.

1, 2. Low - Low Reactor Vessel Water Level and Time Delay

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, RPT is initiated at low-low RPV water level to aid in maintaining level above the top of the active fuel. The reduction of core flow reduces the neutron flux and thermal power and, therefore, the rate of coolant boiloff.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

Four channels of Low - Low Reactor Vessel Water Level, with two channels in each trip system, are available and required to be operable to ensure that no single instrument failure can preclude an RPT from this Trip Function on a valid signal. In addition, a time delay is associated with each Low - Low Reactor Vessel Water Level channel which delays the Low - Low Reactor Vessel Water Level Trip Function channel output signal from providing input to the associated trip system. Four channels of Time Delay, with two channels in each trip system, are available and required to be operable to ensure that no single instrument failure can preclude an RPT from the Low - Low Reactor Vessel Water Level Trip Function on a valid signal.

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The Low - Low Reactor Vessel Water Level Trip Setting is chosen so that RPT will not interfere with the Reactor Protection System. The Trip Setting is referenced from the top of enriched fuel. The Trip Setting of the Time Delay associated with the Low - Low Reactor Vessel Water Level Trip Function is chosen to avoid making the consequences of a loss of coolant accident more severe while ensuring the delay has an insignificant affect on the ATWS consequences.

3. High Reactor Pressure

Excessively high RPV pressure may rupture the RCPB. An increase in the RPV pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This increases neutron flux and thermal power, which could potentially result in fuel failure and overpressurization. The High Reactor Pressure Trip Function initiates an RPT for transients that result in a pressure increase, counteracting the pressure increase by rapidly reducing core power generation. For the overpressurization event, the RPT aids in the termination of the ATWS event and, along with the safety valves, limits the peak RPV pressure to within the required limit.

The High Reactor Pressure signals are initiated from four pressure transmitters that monitor reactor pressure. Four channels of High Reactor Vessel Pressure, with two channels in each trip system, are available and are required to be operable to ensure that no single instrument failure can preclude an RPT from this Trip Function on a valid signal. The High Reactor Vessel Pressure Trip Setting is chosen to provide an adequate margin to the maximum allowable Reactor Coolant System pressure.

ACTIONS

Table 3.2.7 ACTION Note 1

For Trip Functions 1, 2, and 3, with one or more Trip Function channels inoperable, but with RPT trip capability for each Trip Function maintained (refer to next paragraph), the RPT instrumentation is capable of performing the intended function. However, the reliability and redundancy of the RPT Instrumentation is reduced, such that a single failure in the remaining trip system could result in the inability of the RPT Instrumentation to perform the intended function. Therefore, only a limited time is allowed to restore the inoperable channels to operable status. Because of the diversity of sensors available to provide trip signals, the low probability of extensive numbers of inoperabilities affecting all diverse Trip Functions, and the low probability of an event requiring the initiation of RPT, 14 days is provided to restore the inoperable channel (Table 3.2.7 ACTION Note 1.a.1)). Alternately, for Trip Functions 1 and 3, the inoperable channel may be placed in trip (Table 3.2.7 ACTION Note 1.a.2)), since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Inoperable channels may be placed in trip using test jacks or other permanently installed circuits. As noted in Table 3.2.7 ACTION Note 1.a.2), placing the channel in trip with no

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

ACTIONS (continued)

further restrictions is not allowed if the inoperable channel is a Trip Function 2 channel (i.e., Time Delay Trip Function) or is the result of an inoperable breaker, since this may not adequately compensate for the inoperable Trip Function 2 channel or inoperable breaker (e.g., the breaker may be inoperable such that it will not open), as applicable. If it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an RPT), or if the inoperable channel is the result of an inoperable breaker, Table 3.2.7 ACTION Note 2 must be entered and its required Actions taken.

Table 3.2.7 ACTION Note 1.b is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Trip Function result in the Trip Function 1 and 2 not maintaining RPT trip capability or Trip Function 3 not maintaining RPT trip capability. A Trip Function is considered to be maintaining RPT trip capability when sufficient channels are operable or in trip such that the RPT Instrumentation will generate a trip signal from the given Trip Function in either of the two trip systems on a valid signal, and both recirculation pumps can be tripped. For Trip Functions 1 and 2, this requires two channels of each Trip Function in the same trip system to be operable or in trip and the RRMG field breakers to be operable or in trip. For Trip Function 3, this requires two channels in the same trip system to be operable or in trip and the RRMG field breakers to be operable or in trip. The 72 hour Completion Time is sufficient for the operator to take corrective action (e.g., restoration or tripping of channels) and takes into account the likelihood of an event requiring actuation of the RPT instrumentation during this period and that Trip Functions 1 and 2 or Trip Function 3 still maintain RPT trip capability.

Table 3.2.7 ACTION Note 1.c is intended to ensure that appropriate Actions are taken if multiple, inoperable, untripped channels within Trip Functions 1, 2, and 3 result in Trip Functions 1, 2, and 3 not maintaining RPT trip capability. The description of a Trip Function maintaining RPT trip capability is discussed in the paragraph above. The 1 hour Completion Time for restoring all but one of the Trip Functions is sufficient for the operator to take corrective action and takes into account the likelihood of an event requiring actuation of the RPT Instrumentation during this period.

Table 3.2.7 ACTION Note 2

With any required Action and associated completion time not met, the plant must be brought to a Mode or other specified condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least STARTUP/HOT STANDBY within 6 hours (Table 3.2.7 ACTION Note 2.b).

Alternately, the associated recirculation pump may be removed from service since this performs the intended function of the instrumentation (Table 3.2.7 ACTION Note 2.a). The allowed Completion Time of 6 hours is reasonable, based on operating experience, both to reach STARTUP/HOT STANDBY from full power conditions and to remove a recirculation pump from service in an orderly manner and without challenging plant systems.

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.I.1

As indicated in Surveillance Requirement 4.2.I.1, RPT Instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.7. Table 4.2.7 identifies, for each Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.I.1 also indicates that when a channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains recirculation pump trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Ref. 2) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that recirculation pumps will trip when necessary.

Surveillance Requirement 4.2.I.2

The Logic System Functional Test demonstrates the operability of the required initiation logic and simulated automatic operation for a specific channel. A system functional test of the recirculation pump trip breakers (i.e., RRMG field breakers) is included in this Surveillance to provide complete testing of the assumed safety function. Therefore, if an RRMG field breaker is incapable of operating, the associated instrument channel(s) would be inoperable. The Frequency of "Once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.2.7, Check

Performance of an Instrument Check once per day, for Trip Functions 1 and 3, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel

BASES: 3.2.I/4.2.I RECIRCULATION PUMP TRIP INSTRUMENTATION

SURVEILLANCE REQUIREMENTS (continued)

is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Table 4.2.7, Functional Test

For Trip Functions 1 and 3, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. For Trip Functions 1 and 3, the Frequency of "Every 3 Months" is based on the reliability analysis of Reference 2.

Table 4.2.7, Calibration

For Trip Functions 1, 2, and 3, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

For Trip Functions 1 and 3, a calibration of the trip units is required (Footnote (a)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The Frequency of every 3 months is based on the reliability analysis of Reference 2 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

REFERENCES

1. UFSAR, Section 7.18.

2. GENE-770-06-1-A, "Bases for Changes To Surveillance Test Intervals and Allowed Out-of-Service Times For Selected Instrumentation Technical Specifications," December 1992.

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Tab 2.J

Degraded Grid Protective System

BASES: 3.2.K/4.2.K DEGRADED GRID PROTECTIVE SYSTEM INSTRUMENTATION

BACKGROUND

Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power sources for energizing the various components such as pump motors, motor operated valves, and the associated control components. The Degraded Grid Protective System instrumentation monitors the 4.16 kV emergency buses. Offsite power is the preferred source of power for the 4.16 kV emergency buses. If the monitors determine that insufficient voltage is available and an ECCS initiation signal is present, the buses are disconnected from the offsite power sources and connected to the onsite diesel generator (DG) power sources.

Each 4.16 kV emergency bus has its own independent Degraded Grid Protective System instrumentation and associated trip logic. The voltage for each bus is monitored for degraded voltage.

The Degraded Bus Voltage - Voltage Trip Function is monitored by two undervoltage relays for each 4.16 kV emergency bus, whose outputs are arranged in a two-out-of-two logic configuration (Ref. 1). The Degraded Bus Voltage - Voltage Alarm Trip Function is monitored by the same undervoltage relays as the Voltage Trip Function, however the outputs are arranged in a one-out-of-two logic configuration. For the Degraded Bus Voltage - Time Delay Trip Function, one channel for each 4.16 kV emergency bus is provided and is dedicated to the DG start function. For the Degraded Bus Voltage - Alarm Time Delay Trip Function, one channel for each 4.16 kV emergency bus is also provided and is dedicated to a control room annunciator function from which manual action is taken for degraded grid protection when an accident signal is not present. The Degraded Bus Voltage - Time Delay and Alarm Time Delay Trip Functions are nominally adjusted to 10 seconds since this would be indicative of a sustained degraded voltage condition. When a Degraded Bus Voltage - Voltage Alarm Trip Function setpoint has been exceeded and persists for nominally ten seconds, either one of the two Degraded Bus Voltage - Voltage Alarm Trip Function channels on an associated 4.16 kV emergency bus will actuate a control room annunciator to alert the operator of the degraded voltage condition. If this sustained degraded voltage condition occurs coincident with a loss of coolant accident (LOCA), both of the Degraded Bus Voltage - Voltage Trip Function channels will actuate causing the associated 4.16 kV emergency bus to be disconnected from the offsite power source and connected to the DG power source. If the sustained degraded voltage condition does not exist at the time of a LOCA, the 4.16 kV emergency buses are not disconnected from the offsite power sources and the ECCS loads will start immediately from their normal supplies.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The degraded grid protection assures the ECCS loads and other assumed systems powered from the DGs are powered from the offsite power system as long as offsite power system voltage is within an acceptable value and it assures that loads are powered from the DGs when bus voltage is insufficient for continuous operation of the connected loads. The Degraded Grid Protective System instrumentation is required for Engineered Safety Features to function in any accident with a degradation or loss of offsite power. The required

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

channels of Degraded Grid Protective System instrumentation ensure that the ECCS and other assumed systems powered from the DGs, provide plant protection in the event of any of the Reference 2 and 3 analyzed accidents in which a loss of offsite power is assumed. The initiation of the DGs on degradation or loss of offsite power, and subsequent initiation of the ECCS, ensures that the requirements of 10 CFR 50.46 are met.

Accident analyses credit the loading of the DGs based on the loss of offsite power coincident with a loss of coolant accident (LOCA). The diesel starting and loading times have been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power.

The Degraded Grid Protective System instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

The operability of the Degraded Grid Protective System instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions. Each Trip Function must have the required number of operable channels in each trip system, with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with actual trip setpoints within calculational as-found tolerances provides reasonable assurance that, under worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.8. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below for the Degraded Grid Protective System instrumentation Trip Functions.

1.a, 1.b, 1.c, 1.d. Degraded Bus Voltage - Voltage, Degraded Bus Voltage - Time Delay, Degraded Bus Voltage - Voltage Alarm and Degraded Bus Voltage - Alarm Time Delay

A reduced voltage condition on a 4.16 kV emergency bus indicates that, while offsite power may not be completely lost to the respective emergency bus, available power may be insufficient for starting large ECCS motors without risking damage to the motors that could disable the ECCS function. Therefore, power supply to the bus is automatically transferred from offsite power to onsite DG power when the voltage on the bus drops below the Degraded Bus Voltage - Voltage Trip Function trip setpoint, is sustained in a degraded condition for approximately 10 seconds and a LOCA condition exists (as indicated by ECCS Low - Low Reactor Vessel Water Level or High Drywell Pressure Trip Function signals). This ensures that adequate power will be available to the required equipment.

In addition, when the voltage on the bus drops below the Degraded Bus Voltage - Voltage Alarm Trip Function trip setpoint, and is sustained in a degraded condition for approximately 10 seconds, a control room annunciator is actuated. This annunciator alerts the operator of the degraded voltage

BASES: 3.2.K/4.2.K DEGRADED GRID PROTECTIVE SYSTEM INSTRUMENTATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

condition so that manual action can be taken for degraded grid protection when an accident signal is not present.

The Degraded Bus Voltage and Voltage Alarm Trip Settings are low enough to prevent inadvertent power supply transfer, but high enough to ensure that sufficient power is available to the required equipment. The Time Delay Trip Settings are long enough to provide time for voltage on the station emergency bus to recover from transients such as motor starts or fault clearing, but short enough to ensure that the operating equipment is not damaged by low voltage.

Two channels of Degraded Bus Voltage - Voltage Trip Function and one channel of Degraded Bus Voltage - Time Delay Trip Function per associated bus are required to be operable when the associated DG is required to be operable to ensure that no single instrument failure can preclude the DG function.

In addition, two channels of Degraded Bus Voltage - Voltage Alarm Trip Function and one channel of Degraded Bus Voltage - Alarm Time Delay Trip Function per asociated bus are required to be operable when the associated DG is required to be operable to ensure that no single instrument falure can preclude the alarm function.

ACTIONS

Table 3.2.8 ACTION Note 1

With one or more required channels of the Degraded Bus Voltage - Voltage Trip Function inoperable, the Trip Function is not capable of performing the intended function. Therefore, only 1 hour is allowed to restore the inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.8 ACTION Note 1.a. The inoperable channel may be tripped using test jacks or other permanently installed circuits. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure (within the Degraded Grid Protective System instrumentation), and allow operation to continue. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour completion time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

If placing an inoperable channel in the tripped condition would result in an initiation, then Action Note 1.a cannot be met. If the Action and associated completion time of Table 3.2.8 ACTION Note 1.a are not met, the associated Trip Function is not capable of performing the intended function. Therefore, the associated DG(s) is declared inoperable immediately. This requires entry into the applicable LCO and required Actions of the DG Technical Specifications, which provide appropriate actions for the inoperable DG(s).

BASES: 3.2.K/4.2.K DEGRADED GRID PROTECTIVE SYSTEM INSTRUMENTATION

ACTIONS (continued)

Table 3.2.8 ACTION Note 2

With one or more required channels of the Degraded Bus Voltage - Time Delay Trip Function inoperable, the Trip Function is not capable of performing the intended function. Therefore, only 1 hour is allowed to restore the inoperable channel to operable status (Table 3.2.8 ACTION Note 2.a). Table 3.2.8 ACTION Note 2.a. does not allow placing the channel in trip since this action would not necessarily result in a safe state for the channel in all events. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour completion time is acceptable because it minimizes risk while allowing time for restoration of channels.

If the Action and associated completion time of Table 3.2.8 ACTION Note 2.a are not met, the associated Trip Function is not capable of performing the intended function. Therefore, the associated DG(s) is declared inoperable immediately. This requires entry into applicable LCO and required Actions of the DG Technical Specifications, which provide appropriate actions for the inoperable DG(s).

Table 3.2.8 ACTION Note 3

With one of the required channels, for one or more buses, of the Degraded Bus Voltage - Voltage Alarm Trip Function inoperable, the Trip Function is not capable of performing the intended function assuming a single failure. Since this Trip Function is not common to RPS, 24 hours is allowed to restore the inoperable channel to operable status (Table 3.2.8 ACTION Note 3.b). With both of the required channels, for one or more buses, of the Degraded Bus Voltage - Voltage Alarm Trip Function inoperable, or with the one required channel, for one or more buses, of the Degraded Bus Voltage - Alarm Time Delay Trip Function inoperable, the Trip Function is not capable of performing the intended function. Therefore, only 1 hour is allowed to restore at least one channel of the Degraded Bus Voltage - Voltage Alarm Trip Function and the one channel of the Degraded Bus Voltage - Alarm Time Delay Trip Function to operable status (Table 3.2.8 ACTION Note 3.a). Table 3.2.8 ACTION Notes 3.a and 3.b do not allow placing an inoperable channel in trip since this action would not necessarily result in a safe state for the channel in all events. The completion times are intended to allow the operator time to evaluate and repair any discovered inoperabilities. The completion times are acceptable because they minimize risk while allowing time for restoration of channels.

If the Action and associated completion times of Table 3.2.8 ACTION Notes 3.a or 3.b are not met, the associated Trip Function may not be capable of performing the intended function. Therefore increased voltage monitoring of the associated 4.16 kV emergency bus(es) is initiated. This action will compensate for the inoperable control room annunciator function to ensure manual action is taken for degraded grid protection when an accident signal is not present.

BASES: 3.2.K/4.2.K DEGRADED GRID PROTECTIVE SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.K.1

As indicated in Surveillance Requirement 4.2.K.1, Degraded Grid Protective System instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.8. Table 4.2.8 identifies, for each Trip Function, the applicable Surveillance Requirements.

Table 4.2.8, Functional Test

For Trip Functions 1.a and 1.b, as indicated in Table 4.2.8 Footnote (a), separate Functional Tests are not required since Trip Function operability is demonstrated during the Trip Function Calibration and integrated ECCS test performed once per Operating Cycle. For the Trip Function Calibration, the "once per Operating Cycle" Frequency is based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses. For the integrated ECCS test, the "once per Operating Cycle" Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the integrated ECCS test when performed at the specified Frequency.

Table 4.2.8, Calibration

For Trip Functions 1.a and 1.b, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

REFERENCES

1. UFSAR, Section 8.5.3.

2. UFSAR, Section 6.5.

3. UFSAR, Chapter 14.

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Revised Technical Specification Bases Pages

Tab 2.K

RCIC System Actuation

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

BACKGROUND

The purpose of the RCIC System instrumentation is to initiate actions to ensure adequate core cooling when the reactor vessel is isolated from its primary heat sink (the main condenser) and normal coolant makeup flow from the Reactor Feedwater System is insufficient or unavailable, such that RCIC System initiation occurs and maintains sufficient reactor water level such that initiation of the low pressure Emergency Core Cooling Systems (ECCS) pumps does not occur. A more complete discussion of the RCIC System is provided in UFSAR, Section 4.7 (Ref. 1).

RCIC System automatic initiation occurs for conditions of Low - Low Reactor Vessel Water Level. The variable is monitored by four transmitters that are connected to four trip units. The Low - Low Reactor Vessel Water Level Trip Function is a single trip system with two trip system logics. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic arrangement.

The RCIC test line isolation valve is closed on a RCIC initiation signal to allow full system flow.

The RCIC System also monitors the water level in the condensate storage tank (CST) since this is the initial source of water for RCIC operation. Reactor grade water in the CST is the normal source. Upon receipt of a RCIC initiation signal, the CST suction valve is automatically signaled to open. If the water level in the CST falls below a preselected level, the RCIC suppression pool suction valves automatically open. When the suppression pool suction valves are both fully open, the RCIC CST suction valve automatically closes. Two level transmitters are used to detect low water level in the CST. Either transmitter can cause the suppression pool suction valves to open and the CST suction valve to close (one trip system arranged in a one-out-of-two logic).

The RCIC System provides makeup water to the reactor until the reactor vessel water level reaches the high water level trip (one trip system arranged in a two-out-of-two logic), at which time the RCIC steam admission valve closes. The RCIC System automatically restarts if a Low - Low Reactor Vessel Water Level signal is subsequently received.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The function of the RCIC System to provide makeup coolant to the reactor is used to respond to transient events. The RCIC System is not an Engineered Safety Feature System and no credit is taken in the safety analyses for RCIC System operation. Based on its contribution to the reduction of overall plant risk, however, the system, and therefore its instrumentation, meets Criterion 4 of 10 CFR 50.36(c)(2)(ii).

The operability of the RCIC System Instrumentation is dependent on the operability of the individual instrumentation channel Trip Functions. Each Trip Function must have the required number of operable channels with their trip setpoints within the calculational as-found tolerances specified in plant procedures. Operation with the actual trip setpoints within the calculational as-found tolerances provides reasonable assurance that, under

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

worst case design basis conditions, the associated trip will occur within the Trip Settings specified in Table 3.2.9. As a result, a channel is considered inoperable if its actual trip setpoint is not within the calculational as-found tolerances specified in plant procedures. The actual trip setpoint is calibrated consistent with applicable setpoint methodology assumptions.

The individual Trip Functions are required to be operable in the RUN Mode and in STARTUP/HOT STANDBY, HOT SHUTDOWN, and Refuel with reactor steam pressure > 150 psig since this is when RCIC is required to be operable.

The specific Applicable Safety Analyses and LCO discussions are listed below on a Trip Function by Trip Function basis.

1. Low - Low Reactor Vessel Water Level

Low reactor pressure vessel (RPV) water level indicates that normal feedwater flow is insufficient to maintain reactor vessel water level and that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the RCIC System is initiated on a Low - Low Reactor Vessel Water Level signal to assist in maintaining water level above the top of the enriched fuel.

Low - Low Reactor Vessel Water Level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Low - Low Reactor Vessel Water Level Trip Setting is chosen to be the same as the ECCS Low - Low Reactor Vessel Water Level Trip Setting (Specification 3.2.A). The Trip Setting is referenced from the top of enriched fuel.

Four channels of Low - Low Reactor Vessel Water Level Trip Function are available and are required to be operable when RCIC is required to be operable to ensure that no single instrument failure can preclude RCIC initiation.

2. Low Condensate Storage Tank Water Level

Low water level in the CST indicates the unavailability of an adequate supply of makeup water from this normal source. Normally, the suction valve between the RCIC pump and the CST is open and, upon receiving a RCIC initiation signal, water for RCIC injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, the RCIC suppression pool suction valves automatically open. When the suppression pool suction valves are both fully open, the RCIC CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the RCIC pump.

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Two level transmitters are used to detect low water level in the CST. The Low Condensate Storage Tank Water Level Trip Function Trip Setting is set high enough to ensure adequate pump suction head while water is being taken from the CST. The trip setting is presented in terms of percent instrument span.

Two channels of Low Condensate Storage Tank Water Level Trip Function are available and are required to be operable when RCIC is required to be operable to ensure that no single instrument failure can preclude RCIC swap to the suppression pool source.

3. High Reactor Vessel Water Level

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the high water level signal is used to close the RCIC steam admission valve to prevent overflow into the main steam lines (MSLs).

High Reactor Vessel Water Level signals for RCIC are initiated from two level transmitters, which sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The High Reactor Vessel Water Level Trip Setting is high enough to preclude closing the RCIC steam admission valve during normal operation, yet low enough to trip the RCIC System to prevent reactor vessel overfill. The Trip Setting is referenced from the top of enriched fuel.

Two channels of High Reactor Vessel Water Level Trip Function are available and are required to be operable when RCIC is required to be operable.

ACTIONS

Table 3.2.9 ACTION Note 1

Table 3.2.9 ACTION Note 1.a is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels of Trip Function 1 result in a complete loss of automatic initiation capability for the RCIC System. In this case, automatic initiation capability is lost if two Trip Function 1 channels in the same trip system logic are inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Table 3.2.9 ACTION Note 1.b is not appropriate, and the RCIC System must be declared inoperable within 1 hour after discovery of loss of RCIC initiation capability. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.9 ACTION Note 1.a, the completion time only begins upon discovery that the RCIC System cannot be automatically initiated due to two inoperable, untripped Low -

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

ACTIONS (continued)

Low Reactor Vessel Water Level channels in the same trip system logic. The 1 hour completion time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide initiation signals and the fact that the RCIC System is not assumed in any accident or transient analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 2) to permit restoration of any inoperable channel to operable status. If the inoperable channel cannot be restored to operable status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.9 ACTION Note 1.b. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue.

With any required Action and associated completion time of Table 3.2.9 ACTION Note 1.a or 1.b not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately.

Table 3.2.9 ACTION Note 2

Table 3.2.9 ACTION 2.a is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels of Trip Function 2 result in automatic RCIC initiation (i.e., suction swap) capability being lost. In this case, automatic RCIC suction swap capability is lost if two Trip Function 2 channels are inoperable and untripped. In this situation (loss of automatic suction swap), the 24 hour allowance of Table 3.2.9 ACTION Note 2.b is not appropriate, and the RCIC System must be declared inoperable within 1 hour from discovery of loss of RCIC initiation capability when the RCIC System suction is aligned to the CST. Table 3.2.9 ACTION Note 2.a is only applicable if the RCIC System suction is not aligned to the suppression pool since, if aligned, the Trip Function is already performed. The completion time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. For Table 3.2.9 ACTION Note 2.a, the completion time only begins upon discovery that the RCIC System cannot be automatically aligned to the suppression pool due to two inoperable, untripped channels in Trip Function 2. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide initiation signals and the fact that the RCIC System is not assumed in any accident or transient analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 2) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to operable

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

ACTIONS (continued)

status within the allowable out of service time, the channel must be placed in the tripped condition per Table 3.2.9 ACTION Note 2.b, which performs the intended function of the channel (shifting the suction source to the suppression pool). Alternatively, Table 3.2.9 ACTION Note 2.b allows the manual alignment of the RCIC System suction to the suppression pool, which also performs the intended function. If either action of Table 3.2.9 ACTION Note 2.b is performed, measures should be taken to ensure that the RCIC System piping remains filled with water.

With any required Action and associated completion time of Table 3.2.9 ACTION Note 2.a or 2.b not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately.

Table 3.2.9 ACTION Note 3

A risk based analysis was performed and determined that an allowable out of service time of 24 hours (Ref. 2) is acceptable to permit restoration of any inoperable Trip Function 3 channel to operable status (Table 3.2.9 ACTION Note 3.a). A required Action (similar to Table 3.2.9 ACTION Note 1.a) limiting the allowable out of service time, if a loss of automatic RCIC initiation capability (i.e., loss of high water level trip capability) exists, is not required. Table 3.2.9 ACTION Note 3 applies to the High Reactor Vessel Water Level Trip Function whose logic is arranged such that any inoperable channel will result in a loss of automatic RCIC initiation capability. As stated above, this loss of automatic RCIC initiation capability was analyzed and determined to be acceptable. One inoperable channel may result in a loss of high water level trip capability but will not prevent RCIC System automatic start capability. However, the Required Action does not allow placing a channel in trip since this action would not necessarily result in a safe state for the channel in all events (a failure of the remaining channel could prevent a RCIC System start).

With any required Action and associated completion time of Table 3.2.9 ACTION Note 3.a not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.2.L.1

As indicated in Surveillance Requirement 4.2.L.1, RCIC System instrumentation shall be checked, functionally tested and calibrated as indicated in Table 4.2.9. Table 4.2.9 identifies, for each Trip Function, the applicable Surveillance Requirements.

Surveillance Requirement 4.2.L.1 also indicates that when a channel is placed in an inoperable status solely for performance of required instrumentation Surveillances, entry into associated LCO and required Actions may be delayed

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS (continued)

as follows: (a) for up to 6 hours for Trip Function 3; and (b) for up to 6 hours for Trip Functions 1 and 2, provided the associated Trip Function maintains RCIC initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to operable status or the applicable LCO entered and required Actions taken. This allowance is based on the reliability analysis (Ref. 2) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC System will initiate when necessary.

Surveillance Requirement 4.2.L.2

The Logic System Functional Test demonstrates the operability of the required initiation logic for a specific channel and includes simulated automatic actuation of the channel. The system functional testing performed in Surveillance Requirement 4.5.G.1 overlaps this Surveillance to provide complete testing of the safety function. The Frequency of "once every Operating Cycle" is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has demonstrated that these components will usually pass the Surveillance when performed at the specified Frequency.

Table 4.2.9, Check

Performance of an Instrument Check once per day, for Trip Function 1, ensures that a gross failure of instrumentation has not occurred. An Instrument Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. An Instrument Check will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each Calibration. Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit. The Frequency is based upon operating experience that demonstrates channel failure is rare. The Instrument Check supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

BASES: 3.2.L/4.2.L REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS (continued)

Table 4.2.9, Functional Test

For Trip Functions 1, 2 and 3, a Functional Test is performed on each required channel to ensure that the channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. For Trip Functions 1, 2 and 3, the Frequency of "Every 3 Months" is based on the reliability analysis of Reference 2.

Table 4.2.9, Calibration

For Trip Functions 1, 2, and 3, an Instrument Calibration is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. An Instrument Calibration leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The specified Instrument Calibration Frequencies are based upon the time interval assumptions for calibration used in the determination of the magnitude of equipment drift in the associated setpoint analyses.

For Trip Functions 1 and 3, a calibration of the trip units is required (Footnote (a)) once every 3 months. Calibration of the trip units provides a check of the actual setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the calculational as-found tolerances specified in plant procedures. The Frequency of every 3 months is based on the reliability analysis of Reference 2 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

REFERENCES

1. UFSAR, Section 4.7.

2. GENE-770-06-2P-A, Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications, December 1992.

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Revised Technical Specification Bases Pages

Tab 2.L

Core and Containment Cooling Systems

BASES: 4.5 (Cont'd)

D., E., and F. Station Service Water and Alternate Cooling Tower Systems and High Pressure Coolant Injection and Automatic Depressurization System

HPCI system testing demonstrates operational readiness of equipment and detects degradations which may affect reliable operation. Testing is conducted during each reactor startup if maintenance that affects operability was performed on the HPCI system. Periodic testing is also performed in accordance with Specification 4.6.E and the inservice testing program.

Sufficient steam flow must be available prior to HPCI testing to avoid inducing an operational transient when steam is diverted to the HPCI system. Reactor startup is allowed prior to performing the required surveillance testing in order to achieve adequate steam pressure and flow. However, a 24-hour limitation is imposed for performing operability testing once reactor steam pressure exceeds 150 psig. The short duration before full functional testing is performed is considered acceptable.

The Automatic Depressurization System is tested during refueling outages to avoid an undesirable blowdown of the Reactor Coolant System.

G. Reactor Core Isolation Cooling System

The frequency and conditions for testing of the RCIC system are the same as for the HPCI system. Testing is conducted in accordance with Specification 4.6.E and provides assurance that the system will function as intended.

H. Minimum Core and Containment Cooling System Availability

Deleted.

I. Maintenance of Filled Discharge Pipe

Observation of water flowing from the discharge line high point vent as required by Specification 4.5.I assures that the Core Cooling Subsystems will not experience water hammer damage when any of the pumps are started. Core Spray Subsystems and LPCI Subsystems will also be vented through the discharge line high point vent following a return from an inoperable status to assure that the system is "solid" and ready for operation.

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Tab 3

Technical Specification Marked-up Pages

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Technical Specification Marked-Up Pages

Tab 3.A

Table of Contents, Definitions And Safety Limits

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1.0 DEFINITIONS

Z. Surveillance Interval - Relocated to Specification 4.0.1.

AA. Deleted

BB. Source Check - The qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

CC. Dose Equivalent I-131 - The dose equivalent I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Federal Guidance Report (FGR) 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1988; FGR 12, "External Exposure to Radionuclides In Air, Water, and Soil," 1993; or NRC Regulatory Guide 1.109, Revision 1, October 1977.

DD. Deleted

EE. Deleted

FF. Deleted

GG. Deleted

HH. Deleted

II. Deleted

JJ. Deleted

KK. Deleted

LL. Deleted

MM. Deleted

NN. Core Operating Limits Report - The Core Operating Limits Report is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.6.C. Plant operation within these operating limits is addressed in individual specifications.

A.2

OO. Reactor Protection System (RPS) Response Time - RPS Response Time shall be the time from the opening of the sensor contact up to and including the opening of the scram solenoid relay.

A.1

1.1 SAFETY LIMIT

A.9

position (with reactor coolant temperature > 212°F)

/HOT STANDBY

A.1

2.1 LIMITING SAFETY SYSTEM SETTING

For no combination of loop recirculation flow rate and core thermal power shall the APRM flux scram trip setting be allowed to exceed 120% of rated thermal power.

b. Flux Scram Trip Setting (Refuel or Startup ~~and~~ Hot Standby Mode) A.1

When the reactor mode switch is in the REFUEL or STARTUP position, average power range monitor (APRM) scram shall be set down to less than or equal to 15% of rated neutron flux ~~(except as allowed by Note 12 of Table 3.1.1)~~. The IRM flux scram setting shall be set at less than or equal to 120/125 of full scale. A.1 the A.9 M.1

B. Deleted

C. Reactor low water level scram setting shall be at least 127 inches above the top of the enriched fuel.

A.1

1.1 SAFETY LIMIT

2.1 LIMITING SAFETY SYSTEM SETTING

D. Reactor low-low water level Emergency Core Cooling System (ECCS) initiation shall be ~~at least~~ 82.5 inches above the top of the enriched fuel.

A.1 ≥ A.1

E. ~~Turbine~~ stop valve scram shall, when operating at ~~greater than~~ 25% of Rated Thermal Power, be ~~less than or equal to~~ 10% valve closure from full open.

A.1 > ≤ A.1

F. ~~Turbine~~ control valve fast closure scram shall, when operating at ~~greater than~~ 25% of Rated Thermal Power, ~~trip upon~~ actuation of the turbine control valve fast closure relay.

A.1 > A.1 be

G. Main steam line isolation valve closure scram shall be ~~less than or equal to~~ 10% valve closure from full open.

A.1 ≤ A.1

H. Main steam line low pressure initiation of main steam line isolation valve closure shall be ~~at least~~ 800 psig.

≥ A.1

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Tab 3.B

Reactor Protection System

A.1

3.1 LIMITING CONDITIONS FOR OPERATION

3.1 REACTOR PROTECTION SYSTEM (RPS)

Applicability:

Applies to the operability of plant instrumentation and control systems required for reactor safety.

Objective:

To specify the limits imposed on plant operation by those instrument and control systems required for reactor safety.

THE RPS instrumentation for each Trip Function in Table 3.1.1 shall be operable

Specification:

A. ~~Plant operation at any power level shall be permitted~~ in accordance with Table 3.1.1. A.2 The system response time from the opening of the sensor contact up to and including the opening of the scram solenoid relay A.3 shall not exceed 50 milliseconds.

~~B. Deleted.~~

A.7 Exercise each automatic scram contactor once every week using the RPS channel test switches or by performing a Functional Test of any automatic RPS Trip Function.

A.3 Verify RPS Response Time is ≤50 milliseconds for each automatic RPS Trip Function once every Operating Cycle.

LA.10 Perform a Logic System Functional Test of RPS Instrumentation Trip Functions once every Operating Cycle.

4.1 SURVEILLANCE REQUIREMENTS

4.1 REACTOR PROTECTION SYSTEM (RPS)

Applicability:

Applies to the surveillance of the plant instrumentation and control systems required for reactor safety.

Objective:

To specify the type and frequency of surveillance to be applied to those instrument and control systems required for reactor safety.

Specification:

A.1 RPS Instrumentation ~~systems~~ shall be checked, functionally tested and calibrated as indicated in Table 4.1.1 ~~and 4.2.2, respectively.~~ A.5 A.6

RPS testing shall also be performed as indicated in Surveillance Requirements 4.1.A.2 and 4.1.A.3.

~~B. Deleted.~~

ADD SR 4.1.A.2 A.7

ADD SR 4.1.A.3 A.3

A.8 When an RPS channel is placed in an inoperable status solely for the performance of required surveillances, entry into associated Limiting Conditions for Operations and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains RPS trip capability.

ADD SR 4.1.A.4 LA.10

A.1 MOVE TO FAR RIGHT COLUMN

A.10 ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE

A.1 ACTIONS REFERENCED FROM ACTION NOTE 1 A.15

TABLE 3.1.1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT REQUIREMENTS

A.1 ACTION A.1 A.9

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS

A.1 REQUIRED

Trip Function	Trip Setting	Refuel	Startup	Run	Minimum Number Operating Instrument Channels Per Trip System	~~Required ACTIONS When Minimum Conditions For Operation Are Not Satisfied~~
1. Mode Switch in Shutdown (5A-S1)		X	X	X	1	NOTE 1; NOTE 2.a
2. Manual Scram (5A-S3A/B)		X	X	X	1	NOTE 1; NOTE 2.d
3. IRM (7/41(A-F))						
a. High Flux	≤120/125	X	X		2	NOTE 1; NOTE 2.a
b. INOP		X	X		2	NOTE 1; NOTE 2.d
4. APRM (APRM A-F)						
a. High Flux (flow bias)	Two loop operation: S≤ 0.33W+ 50.45% for 0% < W ≤ 30.9%; S≤ 1.07W+ 27.23% for 30.9% < W ≤ 66.7%; S≤ 0.55W+ 62.34% for 66.7% < W ≤ 99.0%; With a maximum of 117.0% power for W > 99.0%. Single loop operation: S≤ 0.33W+ 48.00% for 0% < W ≤ 39.1%; S≤ 1.07W+ 19.01% for 39.1% < W ≤ 61.7%; S≤ 0.55W+ 51.22% for 61.7% < W ≤ 119.4%; With a maximum of 117.0% power for W > 119.4%			X	2	NOTE 1; NOTE 2.b
b. High Flux (reduced)	≤15%		X		2	NOTE 1; NOTE 2.a
c. INOP			X	X	2	NOTE 1
5. High Reactor Pressure (PT-2-3-55(A-D))	≤1055 psig		X	X	2	NOTE 1; NOTE 2.a

RUN, STARTUP/HOT STANDBY, REFUEL (a) REFUEL (b) A.9 A.1

STARTUP/HOT STANDBY, REFUEL (a) REFUEL (b) A.1 NA A.9 LA.1 LA.5 L.1 L.2 L.3 A.14 M.1 M.2 M.3 LA.6

RUN A.9

STARTUP/HOT STANDBY REFUEL (a)

RUN, STARTUP/HOT STANDBY, REFUEL (a) A.9 M.2

RUN, STARTUP/HOT STANDBY, REFUEL (a)

(a) With reactor coolant > 212°F A.9

L.11

(b) With reactor coolant ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies. A.9

A.1 MOVE TO FAR RIGHT COLUMN PNPS

TABLE 3.1.1 A.1

REACTOR PROTECTION SYSTEM (~~SCRAM~~) INSTRUMENT ACTION ~~REQUIREMENTS~~ A.1
(Continued)

A.9 APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS

A.1 REQUIRED

A.10 ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE

A.1 ACTIONS REFERENCED FROM ACTION NOTE 1 A.15

Trip Function	Trip Settings	~~Modes in Which Functions Must be Operating~~ Refuel (1)	Startup (2)	Run	~~Minimum Number Operating Instrument~~ Channels Per Trip System (2)	Actions	~~Required ACTIONS When Minimum Conditions For Operation Are Not Satisfied~~ (3)
6. High Drywell Pressure ~~(PT-5-12(A-D)(M))~~	≤2.5 psig	X	X	X	2	NOTE 1	~~A~~ Note 2.a L.2
7. Reactor Low (6) Water Level ~~(LT-2-3-57A/B(M))~~ ~~(LT-2-2-58A/B(M))~~	>127.0 inches	X	X	X	2	NOTE 1	~~A~~ Note 2.a L.2
8. Scram Discharge Volume High Level ~~(LT-3-...(M))~~	≤21 gallons	X	X	X	2 (per volume)	NOTE 1	~~A~~ Note 2.a L.2; Note 2.d L.1
~~9.~~ Deleted A.1							
~~9~~ ~~10.~~ Main steamline isolation valve closure ~~(POS-2-80A-A1,B1 POS-2-86A-A1,B1 POS-2-80B-A1,B2 POS-2-86B-A1,B2 POS-2-80C-A2,B1 POS-2-86C-A2,B1 POS-2-80D-A2,B2 POS-2-86D-A2,B2)~~	≤10% valve closure			~~X~~	~~8~~ 4	NOTE 1	~~A/B/C~~ Note 2.b L.3
~~10~~ ~~11.~~ Turbine control valve fast closure ~~(PS-(37-40))~~	~~(d)~~ (d) ~~(9)~~ ~~(10)~~			X	2	NOTE 1	~~A/D~~ ~~(E)~~ Note 2.c L.4
~~11~~ ~~12.~~ Turbine stop valve closure ~~(SVOS-5-(1-8))~~	≤10% valve closure ~~(10)~~			X	~~2~~ 4	NOTE 1	~~A/D~~ ~~(E)~~ Note 2.c

(6) RUN, STARTUP/HOT STANDBY, REFUEL (a) A.9

(7) RUN, STARTUP/HOT STANDBY, REFUEL (a)

(8) RUN, STARTUP/HOT STANDBY, REFUEL (a) REFUEL (b) A.9

(9) RUN A.9

(10) >25% RATED THERMAL POWER A.12

(11) >25% RATED THERMAL POWER A.12

A.9 (a) With reactor coolant temperature > 212°F

L.11 (b) With reactor coolant temperature ≤ 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies.

A.1 (d) Channel signals for the turbine control valve fast closure trip shall be derived from the same event or events which cause the control valve fast closure.

~~Amendment No. 164, 186, 212, 219~~

A.1 A.1 A.1 A.1 A.1 A.9 A.9 A.9 L.1

TABLE 3.1.1 NOTES

Footnote (b) ~~1.~~ ~~When the reactor is subcritical and~~ with ~~the~~ reactor ~~water~~ coolant temperature ~~is~~ less than ~~212°F~~ or equal to, ~~only the following Trip Functions need to be operable:~~ and any control rod withdrawn from a core cell containing one or more fuel assemblies — Action — Footnote (a)

L.11 L.1

a) mode switch in shutdown

b) manual scram

c) high flux IRM ~~or high flux SRM in coincidence~~ and IRM inop. M.5 M.5

d) scram discharge volume high water level

See Action Note 1, first sentence, in insert

② There shall be two operable or tripped trip systems for each Trip Function, except as provided for below: A.21 ①

~~3.~~ For each Trip Function with one less than the required minimum number of operable instrument channels, place the inoperable instrument channel and/or its associated trip system in the tripped condition* within 12 hours. ~~Otherwise,~~ initiate the ACTION required by Table 3.1.1 for the Trip Function. A.21 ③ LA.4 A.21 ① A.21 ①

See Action Note 1.a on insert

~~4.~~ ~~For each Trip Function~~ with two or more channels less than the required minimum number of operable instrument channels: A.21 ⑤

1) Within one hour, verify sufficient instrument channels remain operable or tripped* to maintain trip capability in the Trip Function, and A.21 ⑥ LA.4

See Action Note 1.c on insert

2) Within 6 hours, place the inoperable instrument channel(s) in one trip system and/or that trip system** in the tripped condition*, and A.21 ⑥ LA.4 LA.4

See Action Note 1.b on insert

~~3) Within 12 hours, restore the inoperable instrument channel(s) in the other trip system to an operable status, or place the inoperable instrument channel(s) in the trip system and/or that trip system in the tripped condition*.~~ A.21 ④

See Action Note 1 last sentence in insert

If any of these three conditions cannot be satisfied, initiate the ACTION required by Table 3.1.1 for the affected Trip Function. A.21

* An inoperable instrument channel or trip system need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, if the inoperable instrument channel is not restored to operable status within the required time, the ACTION required by Table 3.1.1 for that Trip Function shall be taken.

** This action applies to that trip system with the greatest number of inoperable instrument channels. If both systems have the same number of inoperable instrument channels, the ACTION can be applied to either trip system.

LA.4

When a channel is placed in an inoperable status solely for performance of required 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 RPS trip capability.

A.8

① = First bullet of A.21
② = Second bullet of A.21
③ = Third bullet of A.21
④ = Fourth bullet of A.21
⑤ = Fifth bullet of A.21
⑥ = Sixth bullet of A.21

Legend for flags above. Not part of TS change.

A.1

A.1

ACTION

TABLE 3.1.1 ACTION NOTES (Cont'd)

A.15

2 ~~3.~~ ~~When the requirements in the column "Minimum Number of Operating Instrument Channels Per Trip System" cannot be met for one system, that system shall be tripped. If the requirements cannot be met for both trip systems, the appropriate ACTIONS listed below shall be taken:~~

SEE ACTION NOTE 2.a - 2.c ON INSERT

PLACE THE REACTOR IN HOT SHUTDOWN L.2

a ~~a)~~ ~~Initiate insertion of operable rods and complete insertion of all operable rods within four hours.~~ (12)

b ~~b)~~ ~~Reduce power level to IRM range and place mode switch in the "Startup/Hot Standby" position within eight hours.~~ LA.2

~~c) Reduce turbine load and close main steam line isolation valves within 8 hours.~~ L.3

c ~~d)~~ Reduce reactor power to less than OR EQUAL TO 25% of ~~rated~~ RATED THERMAL POWER within 8 hours. L.4

~~4. The specified APRM High Flux scram (flow bias) Trip Setting is an Allowable Value, which is the limiting value that the trip setpoint may have when tested periodically. The actual scram trip setting is conservatively set in relation to the Allowable Value. "W" is percent rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 x 10^6 lbs/hr core flow.~~ LA.5

~~5. To be considered operable an APRM must have at least 2 LPRM inputs per level and at least a total of 13 LPRM inputs, except that channels A, C, D, and F may lose all LPRM inputs from the companion APRM Cabinet plus one additional LPRM input and still be considered operable.~~ LA.6

~~6. The top of the enriched fuel has been designated as 0 inches and provides common reference level for all vessel water level instrumentation.~~ LA.7

~~7. Deleted.~~

~~8. Deleted.~~ A.1

A.1

FOOTNOTE (d) ~~9.~~ Channel signals for the turbine control valve fast closure trip shall be derived from the same event or events which cause the control valve fast closure.

10. Turbine stop valve closure and turbine control valve fast closure scram signals may be bypassed at ≤ 25% of reactor Rated Thermal Power. A.12 LA.8

~~11. Not used.~~ A.1

~~12. While performing refuel interlock checks which require the mode switch to be in Startup, the reduced APRM High flux scram need not be operable provided:~~

~~a. The following trip functions are operable:~~

~~1. Mode switch in shutdown,~~
~~2. Manual scram,~~
~~3. High flux IRM scram~~
~~4. High flux SRM scram in noncoincidence,~~
~~5. Scram discharge volume high water level, and;~~

~~b. No more than two (2) control rods withdrawn. The two (2) control rods that can be withdrawn cannot be face adjacent or diagonally adjacent.~~ M.1

d. IMMEDIATELY INITIATE ACTION TO FULLY INSERT ALL INSERTABLE CONTROL RODS IN CORE CELLS CONTAINING ONE OR MORE FUEL ASSEMBLIES. L.1

SEE ACTION NOTE 2.d ON INSERT

INSERT FOR TABLE 3.1.1 ACTION NOTES MARK-UP, PAGE 24

A.21 FIRST BULLET

1. With one or more required Reactor Protection System channels inoperable, ~~take all of the applicable Actions in Notes 1.a, 1.b, and 1.c below.~~

A.21 FIRST BULLET

A.21 SECOND BULLET

a. ~~With one or more Trip Functions with~~ one or more required channels inoperable:

   1) Place an inoperable channel for each Trip Function in trip within 12 hours; or

   2) Place the associated trip system in trip within 12 hours.

A.21 FIRST BULLET

THIRD BULLET A.21

b. ~~With one or more Trip Functions with~~ one or more required channels inoperable in both trip systems:

   1) Place an inoperable channel in one trip system in trip within 6 hours; or

   2) Place one trip system in trip within 6 hours.

A.21 FIFTH BULLET

M.6

A.21 FOURTH BULLET

c. With one or more Trip Functions with Reactor Protection System trip capability not maintained:

   1) Restore Reactor Protection System trip capability within 1 hour.

SECOND BULLET A.21

If any applicable Action and associated completion time of Notes 1.a, 1.b, or 1.c is not met, take the applicable Action of Note 2 below referenced in Table 3.1.1 for the channel.

2. a. Place the reactor in HOT SHUTDOWN within 12 hours. L.2

   b. Place the reactor in STARTUP/HOT STANDBY within 8 hours. L.3

   c. Reduce reactor power to $\leq$ 25% Rated Thermal Power within 8 hours. L.4

   d. Immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. L.1

A.1 A.6 A.16 Check A.5 A.1

~~REACTOR PROTECTION SYSTEM~~ See Insert TESTS AND FREQUENCIES A.1 A.1 Calibration

TABLE 4.1.1

~~SCRAM INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS~~

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

Insert from Page 27

A.1 TRIP FUNCTION LA.10 A.1 A.17 A.1

	~~Instrument Channel~~	~~Group~~(3)	~~Functional Test~~(7)	~~Minimum Frequency~~(4)
1.	Mode Switch in Shutdown	~~A~~	~~Place Mode Switch in Shutdown~~	Each Refueling Outage
2.	Manual Scram	~~A~~	~~Trip Channel and Alarm~~ L.7	Every 3 Months
3.	IRM			
	High Flux (8) A.16	~~C~~	~~Trip Channel and Alarm~~(4) A.19	Within 31 Days Before Entering STARTUP/HOT STANDBY ~~(2)~~ (b) and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling
	~~Inoperative~~ A.1	~~C~~	~~Trip Channel and Alarm~~	Within 31 Days Before Entering STARTUP/HOT STANDBY ~~(2)~~ (b) and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling
4.	APRM			
	High Flux	~~B~~	~~Trip Output Relays~~(5) A.19	Every 3 Months
	High Flux (Reduced)	~~B~~	~~Trip Output Relays~~(5)	~~Before Each Startup & Weekly During Refueling~~(6) See Insert M.8 A.18 (b) L.6
	~~Inoperative~~ A.1	~~B~~	~~Trip Output Relays~~	Every 3 Months
	Flow Bias A.1	~~B~~	~~Trip Output Relays~~(5)	Every 3 Months
5.	High Reactor Pressure	~~B~~	~~Trip Channel and Alarm~~(5)	Every 3 Months
6.	High Drywell Pressure A.16	~~B~~	~~Trip Channel and Alarm~~(5)	Every 3 Months
7.	Low Reactor Water Level (2)(8) LA.9	~~B~~	~~Trip Channel and Alarm~~(5)	Every 3 Months
8.	High Water Level in Scram Discharge Volume	~~B~~	~~Trip Channel and Alarm~~(5)	Every 3 Months
9.	Main Steam Line Iso. Valve Closure	~~A~~	~~Trip Channel and Alarm~~	Every 3 Months
10.	Turbine Con. Valve Fast Closure	~~A~~	~~Trip Channel and Alarm~~	Every 3 Months
11.	Turbine Stop Valve Closure	~~A~~	~~Trip Channel and Alarm~~	Every 3 Months
A.7	Scram Test Switch ~~(5A-S2 (A-D))~~	~~A~~	~~Trip Channel and Alarm~~	Once each week (9) A.7
10.a, 11.a	First Stage Turbine Pressure - Permissive ~~(PS-5-14 (A-D))~~ LA.1	~~A~~	~~Trip Channel and Alarm~~	Every 6 Months

L.5 LA.10 L.7

(a)
(b)
(c)
(e)

See Page 28 for Footnote text. (Footnote (d) added by incorporation of Page 27 content.)

Insert for Page 25 Mark-up

TABLE 4.1.1

SCRAM INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS

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

A.5

Instrument Channel	Check	Group[3]	Functional Test[7]	Minimum Frequency[4]
Mode Switch in Shutdown	NA	A	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	NA	A	Trip Channel and Alarm	Every 3 Months
IRM				
High Flux[10] A.16	Once/Day (a)	C	Trip Channel and Alarm[5]	Within 31 Days Before Entering STARTUP/HOT STANDBY[11] and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling
Inoperative	NA	C	Trip Channel and Alarm	Within 31 Days Before Entering STARTUP/HOT STANDBY[11] and Every 31 Days During STARTUP/HOT STANDBY, Every 31 Days During Refueling
A.1				
APRM				
High Flux (Flow Bias)	NA	B	Trip Output Relays[5]	Every 3 Months
High Flux (Reduced)	(a)	B	Trip Output Relays[5]	~~Before Each Startup & Weekly During Refueling~~[6] Within 7 days before entering STARTUP/HOT STANDBY[6] and every 7 days during STARTUP/HOT STANDBY, every 7 days during REFUELING. M.8
Inoperative	NA	B	Trip Output Relays	Every 3 Months
~~Flow Bias~~ A.1		B	~~Trip Output Relays[5]~~ A.1	Every 3 Months
High Reactor Pressure A.16	Once/Day	B	Trip Channel and Alarm[5]	Every 3 Months
High Drywell Pressure	NA	B	Trip Channel and Alarm[5]	Every 3 Months
Low Reactor Water Level[2][8]	Once/Day A.16	B	Trip Channel and Alarm[5]	Every 3 Months
High Water Level in Scram Discharge Volume	NA	B	Trip Channel and Alarm[5]	Every 3 Months
Main Steam Line Iso. Valve Closure	NA	A	Trip Channel and Alarm	Every 3 Months
Turbine Con. Valve Fast Closure	NA	A	Trip Channel and Alarm	Every 3 Months
Turbine Stop Valve Closure	NA	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))	NA	A	Trip Channel and Alarm	Every 6 Months

A.1 A.6

TABLE 4.1.1 NOTES

1. Not used A.1

2. An instrument check shall be performed on reactor water level and reactor pressure instrumentation once per day. A.16

3. A description of the three groups is included in the basis of this Specification. L.5

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. A.17

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. A.19

6. Frequency need not exceed weekly. A.18

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. LA.10

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. LA.9

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. A.7 The automatic scram contactors shall also be exercised after maintenance on the contactors. LA.13

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. A.16

Footnote (b) 11. Not required to be ~~performed~~ COMPLETED when entering STARTUP/HOT STANDBY MODE from RUN MODE until 12 hours after entering STARTUP/HOT STANDBY MODE. L.6

A.1

A.1 A.6 A.1

REACTOR PROTECTION SYSTEM

TABLE 4.1.~~2~~ 1 A.1

~~SCRAM~~ INSTRUMENT CALIBRATION ATION A.1

~~MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS~~

WITHIN 7 DAYS BEFORE ENTERING STARTUP/HOT STANDBY (b)(c)(e), AND EVERY 7 DAYS DURING STARTUP/HOT STANDBY (c)(e), EVERY 7 DAYS DURING REFUELING (c)(e) L.12

TRIP FUNCTION A.1 ~~Instrument Channel~~ A.1 (a)	~~Group~~(1) L.5	~~Calibration Standard~~(4) A.3 L.8 A.1	~~Minimum Frequency~~(2) A.17
3. High Flux IRM			
a. Output Signal (7)(15)(11)	~~C~~	~~Standard Voltage Source~~	Once/Operating Cycle (b) (c) A.1 L.10
4. High Flux APRM (a) A.1			
a. Output Signal	~~B~~	Heat Balance L.12	Once Every 7 Days (d) L.12
b. Output Signal (Reduced) (d)	~~B~~	~~Heat Balance~~	~~Once Every 7 Days~~ (b)(c)(e) L.6
a. Flow Bias	~~B~~	~~Standard Pressure and Voltage Source~~	Refueling Outage
			Every 3 Months (8) (e) A.1
4.a. LPRM ~~(LPRM ND-2-1-104(80))~~ LA.1	~~B~~(5) LA.12	Using TIP System	Every 2,000 MWD/T average core exposure (9) A.20 M.11
5. High Reactor Pressure	~~B~~	~~Standard Pressure Source~~	Once/Operating Cycle
10. Turbine Control Valve Fast Closure	~~A~~	~~Standard Pressure Source~~	Every 3 Months Every 3 Months(e)
6. High Drywell Pressure	~~B~~	~~Standard Pressure Source~~	Once/Operating Cycle
8. High Water Level in Scram Discharge Volume	~~B~~	~~Water Level~~	Once/Operating Cycle
7. Low Reactor Water Level	~~B~~	~~Standard Pressure Source~~	Once/Operating Cycle
11. Turbine Stop Valve Closure	~~A~~	~~(6)~~ LA.11	Refueling Outage
10a. 11a. First Stage Turbine Pressure Permissive ~~(PS-5-14(A-D))~~ LA.1	~~A~~	~~Pressure Source~~ L.8	Every 6 Months and After Refueling
9. Main Steam Line Isolation Valve Closure	~~A~~ L.5	~~(6)~~ LA.11	Refueling Outage Prior to Entering STARTUP/HOT STANDBY for Plant Startup M.9

(d) Not required to be performed until 12 hours after reactor power is ≥ 23% of Rated Thermal Power. L.10

Relocated to Table 4.1.1 A.1

A.1 A.6

1 A.1

TABLE 4.1 ~~2~~ NOTES

L.5

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.~~ A.17

3. ~~Deleted.~~ A.1

4. Response time is not part of the routine instrument check and calibration, but will be checked every operating cycle. A.3

5. ~~Does not provide scram function.~~ LA.12

Footnote

6. ~~Physical inspection and actuation.~~ LA.11

(a) ~~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.

A.1 Footnote A.20

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

(e) ~~9.~~ APRM trip unit calibration only. M.11

Footnote ~~10.~~ Neutron detectors are excluded.

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

A.1 (b) Footnote

COMPLETED

L.6

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Technical Specification Marked-Up Pages

Tab 3.C

ECCS System

A.1

2. Perform a Logic System Functional Test of ECCS instrumentation Trip Functions once every Operating Cycle.

A.3

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the operational status of the plant instrumentation systems which initiate and control a protective function.

Objective:

To assure the operability of protective instrumentation systems.

A.1

Specification:

(ECCS)

A. Emergency Core Cooling System

A.2 L.1 L.4

~~When the system(s) it initiates or controls is required in accordance with Specification 3.5, the instrumentation which initiates the emergency core cooling system(s) shall be~~ operable in accordance with Table 3.2.1.

The ECCS instrumentation for each Trip Function in Table 3.2.1

A.1

B. Primary Containment Isolation

When primary containment integrity is required, in accordance with Specification 3.7, the instrumentation that initiates primary containment isolation shall be operable in accordance with Table 3.2.2.

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

The instrumentation that initiates the isolation of the reactor building ventilation system and the actuation of the standby-gas treatment system shall be operable in accordance with Table 3.2.3.

4.2 SURVEILLANCE REQUIREMENTS

4.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the surveillance requirements of the instrumentation systems which initiate and control a protective function.

Objective:

To verify the operability of protective instrumentation systems.

A.1

Specification:

(ECCS)

A. Emergency Core Cooling System

1. ECCS Instrumentation ~~and Logic systems~~ shall be functionally checked tested and calibrated as indicated in Table 4.2.1.

A.3 A.4

<MOVE TO SEPARATE PAGE> A.1

B. Primary Containment Isolation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.2.

<MOVE TO SEPARATE PAGE> A.1

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.3.

A.5

When an ECCS instrumentation channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed as follows: (a) for up to 6 hours for Trip Function 3.d; and (34) (b) for up to 6 hours for Trip Functions other than 3.d provided the associated Trip Function or redundant Trip Function maintains ECCS initiation capability.

A.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.A

A.2 INSERT "A"

A.1 Required

VYNPS

TABLE 3.2.1

A.1

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

A.1 Actions when Required Channels are Inoperable

A.1 LA.2

1. Core Spray - ~~A 1/3 (Note 4)~~

A.1 A.1 A.1 A.1 A.5

	~~Minimum Number of Operable Instrument Channels per Trip System~~		Trip Function	Trip ~~Level~~ Setting	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
1.a	2	~~(Note 8)~~	High Drywell Pressure ~~(PT-16-19, (A-D)(M))~~	≤2.5 psig	Note ~~10~~ 1
1.b	2	~~(Note 8)~~	Low-Low Reactor Vessel Water Level ~~(LT-2-3-72(A-D)(M))~~	~~≥82.5" above top of enriched fuel~~ LA.3	Note ~~10~~ 1
1.c	1	~~(Note 8)~~	Low Reactor Pressure ~~(PT-2-3-56C/D(M))~~	300 ≤ P ≤ 350 psig	Note ~~11~~ 2
1.d	2	~~(Note 8)~~	Low Reactor Pressure ~~(PT-2-3-56A/B(M) & PT-2-3-52C/D(M))~~ LA.1	300 ≤ P ≤ 350 psig	Note ~~11~~ 2
1.e	1	~~(Note 8)~~ 8 A.1	Pump Start Time Delay ~~(14A-K16A & B)~~	8 ≤ t ≤ 10 seconds	Note ~~12~~ 2
1.f	2 M.7 Per Pump	~~(Note 8)~~	Pump ~~(P-46-1A/B)~~ Discharge Pressure ~~(PS-14-44(A-D))~~	≥100 psig	Note ~~16~~ 8
1.g	1	~~(Note 8)~~	Auxiliary Power Monitor ~~(LNPX C/D)~~	--	Note ~~10~~ 2
1.h	1	~~(Note 8)~~	Pump Bus Power Monitor ~~(27/3A/B, 27/4A/B)~~	--	Note ~~10~~ 2
	~~1~~		~~Trip System Logic~~		~~Note 5~~ L.5

A.1

TABLE 3.2.1

INSERT "A"

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
1.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
1.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
1.c	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
1.d	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
1.e	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a] , (b)
1.f	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]
1.g	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
1.h	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)

A.1

A.1

Required

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

INSERT "B"

A.1

Actions when Required Channels are Inoperable

VYNPS

TABLE 3.2.1
(Cont'd)

A.1

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

A.1 LA.2

2. Low Pressure Coolant Injection System ~~A & B (Note 1)~~

A.1 A.5 A.1 A.1

A.1	~~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.a	1	~~(Note 8)~~	Low Reactor Pressure ~~(PT-2-3-56C/D(M))~~	300 ≤ p ≤ 350 psig	Note ~~11~~ 2	
2.b	2	~~(Note 8)~~	High Drywell Pressure ~~(PT-10-101(A-D)(M))~~ LA.1	≤2.5 psig	Note ~~10~~ 1	A.1
2.c	2	~~(Note 8)~~	Low-Low Reactor Vessel Water Level ~~(LT-2-3-72(A-D)(S1))~~	≥82.5" ~~above top of enriched fuel~~ LA.3	Note ~~10~~ 1	
2.d	1	~~(Note 8)~~ 8 A.1	Reactor Vessel Shroud Level ~~(LT-2-3-73A/B(M))~~	≥2/3 core height	Note ~~13~~ 3	
A.5	~~1~~	~~(Note 9)~~	~~Time Delay (10A-K72A & B)~~	~~≤60 seconds~~	~~Note 12~~	R.1
2.e M.1	1	~~(Note 8)~~ 9	Pump Start Time Delay ~~(10A-K50A & B)~~ LA.1	3 ≤ t ≤ 5 seconds	Note ~~12~~ 2	A.1
	~~1~~	~~(Note 9)~~	~~Low Reactor Pressure (PS-2-128A & B)~~	~~100 ≤ p ≤ 150 psig~~	~~Note 10~~	A.8
2.f	2 per pump	~~(Note 8)~~	RHR Pump ~~(A-D)~~ Discharge Pressure ~~(PS-10-105(A-D))~~	≥100 psig	Note ~~18~~ 8	A.1
2.g	2	~~(Note 8)~~ A.5	High Drywell Pressure ~~(PT-10-101(A-D)(S1))~~ LA.1	≤2.5 psig	Note ~~13~~ 3	

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

INSERT "B"

A.1

A.1 Actions when Required Channels are Inoperable

TABLE 3.2.1
(Cont'd)

A.1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

A.1 LA.2

2. Low Pressure Coolant Injection System (A & B) (Note 1)

A.1 Required

A.1 A.1 A.1

	Minimum Number of Operable Instrument Channels per Trip System		Trip Function	Trip Level Setting	Required ACTION When Minimum Conditions for Operation Are Not Satisfied	
	1	(Note 9)	Time Delay (10A-K45A & B)	≤6 minutes	Note 12	R.2
2.h	2	(Note 8)	Low Reactor Pressure (PT-2-3-56A/B(M) & PT-2-3-52C/D(M))	300 ≤ p ≤ 350 psig	Note ~~1~~ 2	
2.i	1	(Note 8)	Auxiliary Power Monitor (LNPX 27/D)	--	Note ~~18~~ 2	
2.j	1	(Note 8)	Pump Bus Power Monitor (27/3B/B, 27/4A/C)	--	Note ~~18~~ 2	A.1
	1		Trip System Logic	--	Note 5	L.5

A.5 LA.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

A.1

INSERT "C" A.2

A.1 Required

VYNPS

TABLE 3.2.1
(Cont'd)

A.1

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

A.1 Actions when Required Channels are Inoperable

A.1

3. High Pressure Coolant Injection System

A.1

A.5

A.1 A.1

	~~Minimum Number of Operable Instrument Channels per Trip System~~	Trip Function	Trip ~~Level~~ Setting	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
3.a	2 ~~(Notes 3, 8)~~	Low-Low Reactor Vessel Water Level ~~LT-2-3-72(A-D) (S1)~~	~~Same as LPCI~~ ≥ 82.5 inches A.1	Note ~~14~~ 4
3.b	2 ~~(Notes 4, 8)~~	Low Condensate Storage Tank Water Level ~~(LSL-107-5A/B)~~	~~≥ 3%~~ 4.24% (d) M.6	Note ~~15~~ 5
3.c	2 ~~(Notes 3, 8)~~	High Drywell Pressure ~~(PT-10-101(A-D) (M))~~	~~Same as LPCI~~ ≤ 2.5 psig A.1	Note ~~14~~ 4
	~~1~~ ~~(Note 4)~~ L.5	~~Trip System Logic~~ L.5	~~--~~	~~Note 5~~ L.5
3.d	2 ~~(Notes 7, 9)~~ LA.4	High Reactor Vessel Water Level ~~(LT-2-3-72A/B) (S4)~~ LA.1	≤177 inches ~~above top of enriched fuel~~ LA.3	Note ~~16~~ 6 A.1

A.1

(d) PERCENT OF INSTRUMENT SPAN. M.6

TABLE 3.2.1
INSERT "B"

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
2.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
2.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
2.c	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
2.d	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
2.e	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
2.f	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]
2.g	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
2.h	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
2.i	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)
2.j	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a], (b)

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

A.1

VYNPS

INSERT "C" A.2

TABLE 3.2.1
(Cont'd)

A.1 A.1

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

A.1

3. High Pressure Coolant Injection System

	Required A.1 ~~Minimum Number of Operable Instrument Channels per Trip System~~ A.5	Trip Function	Trip ~~Level~~ Setting A.1 A.1	Actions when Required Channels are Inoperable A.1 ~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
3.a	2 ~~(Notes 3,~~ 8)	Low-Low Reactor Vessel Water Level (LT-2-3-72(A-D)(S2))	~~Same as LPCI~~ ≥ 82.5 inches A.1	Note ~~14~~ 4
3.b	2 ~~(Notes 4,~~ 8)	Low Condensate Storage Tank Water Level (LSL-107-5A/B)	~~≥ 5%~~ 4.24%(d) M.6	Note ~~15~~ 5
3.c	2 ~~(Notes 3,~~ 8)	High Drywell Pressure (PT-10-101(A-D)(M))	~~Same as LPCI~~ ≤ 2.5 psig A.1	Note ~~14~~ 4
	~~1~~ ~~(Note 4)~~	~~Trip System Logic~~ L.5	~~--~~	~~Note 5~~ L.5
3.d	2 ~~(Notes 7,~~ 9)	High Reactor Vessel Water Level (LT-2-3-72A/B)(S4)	<177 inches ~~above top of enriched fuel~~ LA.3	Note ~~16~~ 6

A.1 A.1 L.5 LA.4 LA.1

(d) PERCENT OF INSTRUMENT SPAN. M.6

TABLE 3.2.1
INSERT "C"

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
3.a	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
3.b	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
3.c	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
3.d	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]

A.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

INSERT "D" A.2

Required A.1

TABLE 3.2.1
(Cont'd)

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION A.1

Actions when Required Channels are Inoperable A.1

4. Automatic Depressurization A.1

A.1

	Required ~~Minimum Number of Operable Instrument Channels per Trip System (Notes 4)~~ LA.4		Trip Function	Trip ~~Level~~ Setting A.1 A.1	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
4.a	2	(Note 8)	Low-Low Reactor Vessel Water Level ~~(LT-2-3-72(A-D)(M))~~	~~Same as Core Spray~~ ≥ 82.5 inches A.1	Note ~~17~~ 7
4.b	2	(Note 8)	High Drywell Pressure ~~(PT-10-101(A-D)(S1))~~	≤2.5 psig	Note ~~17~~ 7
4.c	1	(Note 8)	Time Delay ~~(2E-K5A/B)~~ LA.1	≤120 seconds	Note ~~18~~ 8 A.1
	~~2~~		~~Trip System Logic~~ L.5	~~--~~	~~Note 6~~ L.5
4.d	2	(Note 8)	Time Delay ~~(2E-K16A/B, 2E-K17A/B)~~	≤8 minutes	Note ~~18~~ 8 A.1

L.5

A.5

TABLE 3.2.1
INSERT "D".

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
4.a	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
4.b	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
4.c	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]
4.d	RUN, STARTUP/HOT STANDBY[a], HOT SHUTDOWN[a], Refuel[a]

TABLE 3.2.1
(Cont'd)

RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

Recirculation Pump Trip - A & B (Note 1)			
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 (Note 8)	Low-Low Reactor Vessel Water Level (LM-2-3-68(A-D))	≥ 6' 10.5" above top of enriched fuel	Note 19
2 (Note 8)	High Reactor Pressure (PM-2-3-54(A-D))	≤ 1150 psig	Note 19
2 (Note 8)	Time Delays (2-3-68(A-D)(X))	≤ 10 seconds	Note 19
1	Trip Systems Logic	--	Note 2

A.9

A.1

(Action) A.1

TABLE 3.2.1 NOTES

~~1. Each of the two Core Spray, LPCI and RPT, subsystems are initiated and controlled by a trip system. The subsystem "B" is identical to the subsystem "A".~~ LA.2

2. If the minimum number of operable instrument channels are not available, the inoperable channel shall be tripped using test jacks or other permanently installed circuits. If the channel cannot be tripped by the means stated above, that channel shall be made operable within 24 hours or an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours. A.9

~~3. One trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic.~~ LA.4

~~4. One trip system with initiating instrumentation arranged in a one-out-of-two logic.~~

~~5. If the minimum number of operable channels are not available, the system is considered inoperable and the requirements of Specification 3.5 apply.~~ L.5 A.6

~~6. Any one of the two trip systems will initiate ADS. If the minimum number of operable channels in one trip system is not available, the requirements of Specification 3.5.F.2 and 3.5.F.3 shall apply. If the minimum number of operable channels is not available in both trip systems, Specifications 3.5.F.3 shall apply.~~ L.5

~~7. One trip system arranged in a two-out-of-two logic.~~ LA.4

~~8.~~ When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required ACTIONS may be delayed for up to 6 hours provided the associated Trip Function or redundant Trip Function maintains ECCS initiation capability ~~or Recirculation Pump Trip capability.~~ A.5 A.7

~~9.~~ When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required ACTIONS may be delayed for up to 6 hours. A.5

A.1 1. ~~10.~~ With one or more channels inoperable ~~for Core Spray and/or LPCI:~~ for ECCS Instrumentation Trip Functions 1.a, 1.b, 2.b, and 2.c: A.1 L.2

~~A.~~ Within one hour from discovery of loss ~~of initiation capability for~~ feature(s) in ~~one~~ both division(s) declare the associated systems inoperable, and

~~B.~~ Within 24 hours, place channel in trip.

~~C.~~ ~~If required actions and associated completion times of actions A or B are not met, immediately declare the associated systems inoperable.~~

A.1 2. for ECCS Instrumentation Trip Functions 1.c, 1.d, 1.e, 1.g, 1.h, 2.d, 2.e, 2.h, 2.i, 2.j A.1

~~11.~~ With one or more channels inoperable ~~for injection permissive and/or recirculation discharge valve permissive~~ or power monitors M.2 L.2

~~A.~~ Within one hour from discovery of loss of initiation capability for feature(s) in ~~one~~ both division(s) declare the associated systems inoperable, and

~~B.~~ Within 24 hours, restore channel to operable status.

~~C.~~ If required actions and associated completion times of actions A or B are not met, immediately declare the associated systems inoperable.

A.1

ACTION A.1

TABLE 3.2.1 NOTES (Cont'd) for ECCS Instrumentation Trip Function 1.c, 1.d, 1.e, 1.g, 1.h, 2.a, 2.e, 2.h, 2.i, 2.j A.1

2. ~~12.~~ With one or more actuation timer ~~channels~~ inoperable ~~for Core Spray and/or LPCI.~~ A.1

both L.2

~~A.~~ Within one hour from discovery of loss of initiation capability for feature(s) in ~~one~~ both divisions, declare the associated systems inoperable, and

~~B.~~ Within 24 hours, ~~place~~ restore channel ~~in trip~~ to operable status M.3

~~C.~~ If required actions and associated completion times of actions A or B ~~are not met, immediately declare the associated systems inoperable.~~

A.1

3. ~~13.~~ for ECCS Instrumentation Trip Functions 2.d and 2.g With ~~one or more channels inoperable~~ ~~for Containment Spray:~~ A.1

For Trip Function 2.g only, associated

~~A.~~ Within one hour from discovery of loss of LPCI System initiation capability, declare the ~~LPCI~~ associated System inoperable, and L.3

~~B.~~ Within 24 hours, place channel in trip for High Drywell Pressure and restore channel to operable status for Reactor Vessel Shroud Level.

~~C.~~ If required action and associated completion times of actions A and B ~~are not met, immediately declare~~ the ~~LPCI System~~ associated systems inoperable. A.1

A.1

4. ~~14.~~ for Instrumentation Trip Functions 3.a and 3.c ~~With one or more channels inoperable~~ ~~for HPCI:~~ A.1

HPCI

~~A.~~ Within one hour from discovery of loss of HPCI system initiation capability, declare the HPCI System inoperable, and

~~B.~~ Within 24 hours, place channel in trip.

~~C.~~ If required actions and associated completion times of actions A or B ~~are not met, immediately~~ declare the HPCI System inoperable.

A.1

5. ~~15.~~ for ECCS Instrumentation Trip Function 3.b ~~With one or more channels inoperable~~ ~~for HPCI:~~ A.1

HPCI

~~A.~~ Within one hour from discovery of loss of HPCI initiation capability while suction for the HPCI System is aligned to the CST, declare the HPCI System inoperable, and

~~B.~~ Within 24 hours, place channel in trip or align suction for the HPCI System to the suppression pool.

~~C.~~ If required actions and associated completion times of actions A or B ~~are not met, immediately declare~~ the HPCI System inoperable.

A.1

6. ~~16.~~ for ECCS Instrumentation Trip Function 3.d With one or more channels inoperable ~~for HPCI:~~ A.1

~~A.~~ Within 24 hours, restore channel to operable status.

~~B.~~ If required action and associated completion time of action A is not ~~met, immediately declare HPCI System inoperable.~~

A.1

7. ~~17.~~ for ECCS Instrumentation Trip Functions 4.a and 4.b ~~With one or more channels inoperable~~ ~~for ADS:~~ A.1

both L.2

A. Within one hour from discovery of loss of ADS initiation capability in ~~one~~ both trip systems, declare ADS inoperable, and

B. Within 96 hours from discovery of an inoperable channel concurrent with HPCI or RCIC System inoperable, place the channel in trip, and

C. Within 8 days, place a channel in trip.

D. If required actions and associated completion times of actions A, B or C are not met, immediately declare ADS inoperable.

A.1

ACTION A.1

for ECCS Instrumentation Trip Functions 1.f, 2.f, 4.c and 4.d

A.1

TABLE 3.2.1 NOTES (Cont'd)

8 ~~18~~. With one or ~~more~~ channels inoperable ~~for ADS~~: A.1

both L.2

~~A~~. Within one hour from discovery of loss of ADS initiation capability in ~~one~~ trip systems declare ADS inoperable, and

~~B~~. Within 96 hours from discovery of an inoperable channel concurrent with HPCI or RCIC System inoperable, restore channel to operable status, and

~~C~~. Within 8 days, restore channel to operable status.

D. If required actions and associated completion times of actions A, B or C are not met, immediately declare ADS inoperable.

19. With one or more channels inoperable for Recirculation Pump Trip:

A. Within one hour from discovery of loss of Recirculation Pump Trip capability restore one Trip Function or remove the associated recirculation pump from service in 6 hours or be in Startup/Hot Standby in 6 hours.

B. Within 14 days from discovery of an inoperable channel, restore channel to operable status or place in trip, and

C. Within 72 hours from discovery of one trip function capability not maintained, restore trip function to operable status and,

D. If required actions and associated completion times of actions A, B or C are not met, immediately remove the associated recirculation pump from service in 6 hours or be in Startup/Hot Standby in 6 hours.

A.9

A.1

A.1

TABLE 4.2.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

SYSTEM A.1

A.1

A.1

Core Spray System

A.1

	Trip Function	Functional Test (8) A.10	Calibration (8) A.10	Instrument Check
1.a	High Drywell Pressure	Every Three Months	Once/Operating Cycle	Once Each Day
1.b	Low-Low Reactor Vessel Water Level	Every Three Months	Once/Operating Cycle	Once Each Day
1.c	Low Reactor Pressure (PT-2-3-56C/D(M))	Every Three Months	Once/Operating Cycle	+ NA
1.d	Low Reactor Pressure (PT-2-3-56A/B(M) & 52C/D(M))	Every Three Months	Once/Operating Cycle	+ NA
1.f	Pump (P-46-1A/B) Discharge Pressure	Every Three Months	Every Three Months	+ NA A.1
1.g	Auxiliary Power Monitor	Every Three Months	None	Once Each Day
1.h	Pump Bus Power Monitor	Every Three Months	None	Once Each Day
SEE FR 4.2.A.2	~~Trip System Logic~~	~~Once/Operating Cycle~~	Once/Operating Cycle (Note 3)	A.18
1.e	Pump Start Time Delay	NA A.1		NA A.1 A.11

Every 3 Months (a) M.5

LA.1

A.1

(a) Trip unit calibration only M.5

A.1

A.1

TABLE 4.2.1
(Cont'd)

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

SYSTEM A.1 A.1

	Low Pressure Coolant Injection System				
A.1	Trip Function	Functional Test (5) A.10	Calibration (5) A.10	Instrument Check A.1	
2.a	Low Reactor Pressure ~~(PT-2-3-56C/D(M))~~ LA.1	Every Three Months	Once/Operating Cycle Every 3 Months (a) M.5	†† NA	A.1
2.b	High Drywell Pressure ~~(PT-10-101A-D(M))~~	Every Three Months	Once/Operating Cycle	Once Each Day	
2.c	Low-Low Reactor Vessel Water Level	Every Three Months	Once/Operating Cycle	Once Each Day	
2.d	Reactor Vessel Shroud Level	Every Three Months	Once/Operating Cycle	†† NA	A.1
	~~Low Reactor Pressure (PS-2-128A/B)~~	~~Every Three Months~~	~~Every Three Months~~	~~--~~	A.8
2.f	RHR Pump Discharge Pressure	Every Three Months	Every Three Months	†† NA	A.1
2.g	High Drywell Pressure ~~(PT-10-101A-D(S1))~~ LA.1	Every Three Months	Once/Operating Cycle Every 3 Months (a) M.5	†† NA	A.1
2.h	Low Reactor Pressure ~~(PT-2-3-56A/B)(M) & 520/D(M))~~	Every Three Months	Once/Operating Cycle	†† NA	A.1
2.i	Auxiliary Power Monitor	Every Three Months	~~None~~ NA A.1	Once Each Day	
2.j	Pump Bus Power Monitor	Every Three Months	~~None~~ NA	Once Each Day	
See 4.2.A.2	~~Trip System Logic~~	~~Once/Operating Cycle~~	Once/Operating Cycle ~~(Note 3)~~	~~--~~	A.18
2.k	LPCI B and C Pump Start Time Delay	NA A.1		NA A.1	A.11

(a) Trip unit calibration only M.5

A.1

A.1 A.1 TABLE 4.2.1 (Cont'd) A.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION SYSTEM A.1

A.1

	Trip Function	Functional Test (B) A.10	Calibration (B) A.10	Instrument Check A.1 A.1
	High Pressure Coolant Injection System			
3.a	Low-Low Reactor Vessel Water Level	Every Three Months	~~Once/operating cycle~~ Every (a) 3 Months, M.5	Once each day
3.b	Low Condensate Storage Tank Water Level	Every Three Months	Every three months	~~~~ NA A.1
3.c	High Drywell Pressure	Every Three Months	~~Once/operating cycle~~ Every (a) 3 Months, M.5	Once each day
see SR 4.2.A.2	~~Trip System Logic~~	~~Once/operating cycle~~	~~Once/Operating Cycle (Note 3)~~ A.12	~~--~~ A.18
3.d	High Reactor Vessel Water Level	Every Three Months	~~Once/operating cycle~~ Every (a) 3 Months, M.5	~~~~ NA A.1

(a) Trip unit calibration only M.5

A.1

A.1 TABLE 4.2.1 (Cont'd)

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION SYSTEM A.1

A.1

Automatic Depressurization System

	Trip Function	Functional Test (8)	Calibration (8)	Instrument Check
4.a	Low-Low Reactor Vessel Water Level	Every Three Months	~~Once/Operating Cycle~~ Every 3 Months, (a) M.5	Once Each Day
4.b	High Drywell Pressure	Every Three Months	Once/Operating Cycle	Once Each Day
SEE SR 4.2.A.7	~~Trip System Logic (Except Solenoids of Valves)~~ LA.5	~~Once/Operating Cycle (Notes 2 and 11)~~ LA.5	Once/Operating Cycle (Note 3)	~~--~~ A.18
4.c	Time Delay	NA		NA A.11
4.d	Sustained Low-Low Reactor Vessel Water Level Time Delay	NA A.1		NA A.11 A.1

A.10 A.10 A.1

(a) Trip unit calibration only. M.5

TABLE 4.2.1
(Cont'd)

MINIMUM TEST AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

Recirculation Pump Trip Actuation System

Trip Function	Functional Test (8)	Calibration (8)	Instrument Check
Low-Low Reactor Vessel Water Level	Every Three Months (Note 4)	Once/Operating Cycle	Once Each Day
High Reactor Pressure	Every Three Months (Note 4)	Once/Operating Cycle	Once Each Day
Trip System Logic	Once/Operating Cycle	Once/Operating Cycle	--

A.9

A.1

~~TABLE 4.2 NOTES~~ A.1

~~1. Not used.~~

2. ~~During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart.~~ LA.5

3. ~~Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.~~ A.11

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.13

~~5. Deleted.~~

~~6. Deleted.~~ A.1

~~7. Deleted.~~

8. ~~Functional tests and calibrations are not required when systems are not required to be operable.~~ A.10

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle. A.15

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation. A.16

11. ~~Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.~~ LA.5

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage. A.17

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power). A.17

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Tab 3.D

Primary Containment Isolation

A.1

2. Perform a Logic System Functional Test of Primary Containment isolation instrumentation Trip Functions once every Operating Cycle.

A.3

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the operational status of the plant instrumentation systems which initiate and control a protective function.

Objective:

To assure the operability of protective instrumentation systems.

Specification:

A. Emergency Core Cooling System

L.1

When the system(s) it initiates or controls is required in accordance with Specification 3.5, the instrumentation which initiates the emergency core cooling system(s) shall be operable in accordance with Table 3.2.1.

B. Primary Containment Isolation

A.2

When primary containment integrity is required, in accordance with Specification 3.7, the ~~instrumentation that initiates primary containment isolation~~ shall be operable in accordance with Table 3.2.2.

The primary containment isolation instrumentation for each Trip Function in Table 3.2.2

A.1

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

The instrumentation that initiates the isolation of the reactor building ventilation system and the actuation of the standby gas treatment system shall be operable in accordance with Table 3.2.3.

4.2 SURVEILLANCE REQUIREMENTS

4.2 PROTECTIVE INSTRUMENT SYSTEMS

Applicability:

Applies to the surveillance requirements of the instrumentation systems which initiate and control a protective function.

Objective:

To verify the operability of protective instrumentation systems.

Specification:

A. Emergency Core Cooling System

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.1.

{Move to separate page} A.1

1. The primary containment isolation

B. Primary Containment Isolation

~~Instrumentation and logic systems~~ shall be ~~functionally tested and calibrated~~ checked as indicated in Table 4.2.2.

A.3

A.4

{Move to separate page} A.1

C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.3.

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 may be delayed for up to 6 hours provided the associated Trip Function maintains isolation capability.

A.5

primary containment isolation

A.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

RUN, STARTUP/HOT STANDBY SHUTDOWN, REFUEL (a) A.2

A.1

VYNPS

PRIMARY CONTAINMENT ISOLATION A.7

TABLE 3.2.~~1~~ 2 A.1
(Cont'd)

A.8

Actions when Required Channels are Inoperable

Actions Referenced from Action Note 1

~~EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION~~

A.1 REQUIRED

~~Low Pressure Coolant Injection System A & B (Note 1)~~

~~Minimum Number of Operable Instrument~~ Channels per Trip System	Trip Function	Trip ~~Level~~ Setting A.1 A.1	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
1 (Note 8)	Low Reactor Pressure (PT-2-3-56C/D(M))	300 ≤ p ≤ 350 psig	Note 11
2 (Note 8)	High Drywell Pressure (PT-10-101(A-D)(M))	≤2.5 psig	Note 10
2 (Note 8)	Low-Low Reactor Vessel Water Level (LT-2-3-72(A-D)(S1))	≥82.5" above top of enriched fuel	Note 10
1 (Note 9)	Reactor Vessel Shroud Level (LT-2-3-73A/B(M))	≥2/3 core height	Note 13
1 (Note 9)	Time Delay (10A-K72A & B)	≤60 seconds	Note 12
1 (Note 9)	Pump Start Time Delay (10A-K50A & B)	3 ≤ t ≤ 5 seconds	Note 12
1 ~~(Note 9)~~ A.5	~~Low~~ High A.6 Reactor Pressure ~~(PS-2-128A & B)~~ LA.1	LA.2 ~~100 ≤~~ p ≤ 150 psig	Note 1 Note ~~10~~ 2.d A.8
2 per pump (Note 8)	RHR Pump (A-D) Discharge Pressure (PS-10-105(A-H))	≥100 psig	Note 18
2 (Note 8)	High Drywell Pressure (PT-10-101(A-D)(S1))	≤2.5 psig	Note 13

A.9

A.9

A.1

5.a

(a) With reactor coolant temperature > 212°F. A.2 L.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

A 1

PRIMARY CONTAINMENT ISOLATION A.7

A.8

Actions when Required Channels are Inoperable

Actions Referenced from Action Note 1

A-1

Required

TABLE 3.2.~~1~~ 2 A.1

(Cont'd)

~~EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION~~

Low Pressure ~~Coolant~~ Injection System A & ~~B~~ (Note 1)

A1 A.1

~~Minimum Number of Operable Instrument~~ Channels per Trip System	Trip Function	Trip ~~Level~~ Setting	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
1 (Note 9)	Time Delay (10A-K45A & B)	≤6 minutes	Note 12
2 (Note 8)	Low Reactor Pressure (PT-2-3-56A/B(M) & PT-2-3-52C/D(M))	300 ≤ p ≤ 350 psig	Note 11
1 (Note 8)	Auxiliary Power Monitor (LNPX C/D)	--	Note 10
1 (Note 8)	Pump Bus Power Monitor (27/3A/B, 27/4A/B)	--	Note 10
~~1~~	~~Trip System Logic~~	~~--~~	~~Note 5~~

A.9

5.b A.1

L.4

A.1

A.1

ACTION A.1

TABLE 3.2.2 NOTES

1. Each of the two Core Spray, LPCI and RPT, subsystems are initiated and controlled by a trip system. The subsystem "B" is identical to the subsystem "A".

2. If the minimum number of operable instrument channels are not available, the inoperable channel shall be tripped using test jacks or other permanently installed circuits. If the channel cannot be tripped by the means stated above, that channel shall be made operable within 24 hours or an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours. A.9

3. One trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic.

4. One trip system with initiating instrumentation arranged in a one-out-of-two logic.

~~5. If the minimum number of operable channels are not available, the system is considered inoperable and the requirements of Specification 3.5 apply.~~ L.4

6. Any one of the two trip systems will initiate ADS. If the minimum number of operable channels in one trip system is not available, the requirements of Specification 3.5.F.2 and 3.5.F.3 shall apply. If the minimum number of operable channels is not available in both trip systems, Specifications 3.5.F.3 shall apply.

7. One trip system arranged in a two-out-of-two logic. A.9

8. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions For Operation and required ACTIONS may be delayed for up to 6 hours ~~provided~~ the associated Trip Function or redundant Trip Function maintains ECCS initiation capability or Recirculation Pump Trip capability.

A.1 ~~9~~. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions For Operation and required ACTIONS may be delayed for up to 6 hours. A.5

SEE ACTION NOTE 1 ON INSERT

~~10~~. With one or more channels inoperable for ~~Core Spray and/or LPCI~~: isolation M.7

SEE ACTION NOTE 1.6 IN INSERT

A.1 ~~A~~. Within one hour from discovery of loss of ~~initiation~~ capability ~~for feature(s) in one division~~, ~~declare the associated systems inoperable~~ L.2 M.1
and L.2

SEE ACTION NOTE 1,4,3 ON INSERT

~~B~~. ~~Within 24 hours, place channel in trip.~~

~~C~~. If required actions and associated completion times of actions A or B are not met, ~~immediately declare the associated systems inoperable.~~ M.1

SEE ACTION NOTE 1 ON INSERT

A.1

11. With one or more channels inoperable for injection permissive and/or recirculation discharge valve permissive:

A. Within one hour from discovery of loss of initiation capability for feature(s) in one division, declare the associated systems inoperable, and

B. Within 24 hours, restore channel to operable status.

C. If required actions and associated completion times of actions A or B are not met, immediately declare the associated systems inoperable. A.9

A.1

REPLACES NOTE 10

INSERT FOR TABLE 3.2.1 ACTION NOTES MARK-UP, PAGE 44

1. WITH ONE OR MORE REQUIRED PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION CHANNELS INOPERABLE ~~TAKE ALL OF THE APPLICABLE ACTIONS IN NOTES 1.a AND 1.b BELOW~~

   a. WITH ONE OR MORE TRIP FUNCTIONS WITH ONE OR MORE REQUIRED CHANNELS INOPERABLE:

      1) FOR TRIP FUNCTIONS 2.a AND 2.b, PLACE ANY INOPERABLE CHANNEL IN TRIP WITHIN 12 HOURS; AND

A.1

REPLACES NOTE 10.B

      2) FOR TRIP FUNCTIONS 3.e, 4.b AND 4.e, RESTORE ANY INOPERABLE CHANNEL TO OPERABLE STATUS WITHIN 24 HOURS; AND

      3) FOR ALL OTHER TRIP FUNCTIONS, PLACE ANY INOPERABLE CHANNEL IN TRIP WITHIN 24 HOURS

A.1

   b. WITH ONE OR MORE TRIP FUNCTIONS WITH ISOLATION CAPABILITY NOT MAINTAINED:

REPLACES NOTE 10.A

      1) RESTORE ISOLATION CAPABILITY WITHIN 1 HOUR. M.1

M.1

PENETRATION FLOW PATHS, ISOLATED AS A RESULT OF COMPLYING WITH THE ABOVE ACTIONS, MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROLS.

REPLACES NOTE 10.C

IF ANY APPLICABLE AND ASSOCIATED COMPLETION TIME OF NOTE 1.a OR 1.b IS NOT MET, TAKE THE APPLICABLE ACTIONS OF NOTE 2 BELOW AND REFERENCED IN TABLE 3.2.2. FOR THE CHANNEL.

A.1

2. a ISOLATE THE ASSOCIATED MAIN STEAM LINE WITHIN 12 HOURS (PENETRATION FLOW PATHS MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROL), OR PLACE THE REACTOR IN HOT SHUTDOWN WITHIN 12 HOURS AND PLACE THE REACTOR IN COLD SHUTDOWN WITHIN THE NEXT 12 HOURS.

   b. PLACE THE REACTOR IN COLD SHUTDOWN WITHIN 24 HOURS

   c. PLACE THE REACTOR IN STARTUP/HOT STANDBY WITHIN 8 HOURS.

   d. ISOLATE THE AFFECTED PENETRATION FLOW PATH WITHIN 1 HOUR (PENETRATION FLOW PATHS MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROL).

M.1

A.1

A.10

A.2

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

INSERT "A"

VYNPS

TABLE 3.2.2

ACTIONS REFERENCED FROM ACTION NOTE 1 A.1

PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

A.1

1. Main Steam Line Isolation

~~Minimum Number of Operable Instrument Channels per Trip System~~ REQUIRED A.1	Trip Function	Trip Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied (Note 2) A.1
1.a A.1 2 (Notes ~~11~~, 12) M.2 8 A.5 A.11	Low-Low Reactor Vessel Water Level ~~(LT-2-3-57A/B(S2), LT-2-3-58A/B(S2))~~	>82.5" ~~above the top of enriched fuel~~ LA.3	A NOTE 2.a L.3
1.b ~~2 of 4 in each of 2 channels~~ (Notes ~~11~~, 12) A.5	High Main Steam Line Area Temperature ~~(TS-2-(121-124)(A-D))~~	~~<212°F~~ ≤196°F FOR CHANNELS MONITORING OUTSIDE STEAM TUNNEL AND ≤200°F FOR CHANNELS MONITORING INSIDE STEAM TUNNEL M.7	B NOTE 2.a M.3
1.c 2/steam line (Notes ~~11~~, 12)	High Main Steam Line Flow ~~(DPT-2-(116-119)(A-D)(M))~~	<140% of rated flow	B NOTE 2.a M.3
1.d 2 (Notes ~~7~~, ~~11~~, 12) A.13	Low Main Steam Line Pressure ~~(PS-2-134(A-D))~~ LA.1	>800 psig	B NOTE 2.C LA.4
1.e 2 (Notes 6, ~~11~~, 12) A.14 A.5	High Main Steam Line Flow ~~(DPT-2-116A, 117B, 118C, 119D(S1))~~ - NOT IN RUN A.12	<40% of rated flow	B NOTE 2.a M.3
2.a 2 (Notes ~~11~~, 12)	Low Reactor Vessel Water Level ~~(LT-2-3-57A/B(M), LT-2-3-58A/B(M))~~	~~Same as Reactor Protection System~~ ≥127.0 INCHES A.1	A NOTE 2.b LA.4
2.b A5 2 (Notes ~~11~~, 12)	High Drywell Pressure	~~Same as Reactor Protection System~~ ≤2.5 PSIG A.1	A NOTE 2.b LA.4
1.f 2 (Notes ~~10~~, ~~11~~, 12)	Condenser Low Vacuum	<12" Hg absolute	A NOTE 2.a L.3
~~1~~ A.15	~~Trip System Logic~~	~~--~~	~~A~~ L.4

A.1

2. Primary Containment Isolation A.1

INSERT "B" A.2

(a) With reactor coolant temperature > 212°F. L.1 A.2

(b) With any turbine stop valve or turbine bypass valve not closed A.2

TABLE 3.2.2
INSERT "A"

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
1.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]
1.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]
1.c	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]
1.d	RUN
1.e	STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]
1.f	RUN, STARTUP/HOT STANDBY [b], HOT SHUTDOWN [b], Refuel [a and b]

TABLE 3.2.2
INSERT "B"

2.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]
2.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel [a]

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

A.1

VYNPS INSERT "C" A.2

A.1 PRIMARY CONTAINMENT

TABLE 3.2.2
(Cont'd)

~~HIGH PRESSURE COOLANT INJECTION SYSTEM~~ ISOLATION INSTRUMENTATION

A.1 Actions Referenced from Action Note 1

A.1 3. High Pressure Coolant Injection (HPCI) System Isolation

~~Minimum Number of Operable Instrument~~ REQUIRED A.1 Channels per Trip System	Trip Function	Trip ~~Level~~ Setting A.1 A.1	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~ A.1
3.a ~~2 per set of 4~~ 6 A.16 (Notes 11, 12) A.5 A.11	High Steam Line Space Temperature ~~(TS-23-7101-104) (B-D)~~ LA.1	~~≤212°F~~ ≤ 196°F M.7	Note 2 2.d
3.b 1 (Notes 12, 22) A.5 A.11	High Steam Line d/p (Steam Line Break) ~~(DPIS-23-76/77)~~	≤195 inches of water	Note 2 2.d
3.c 4 (Notes 8, 12, 13) A.5 A.11 LA.7	Low HPCI Steam Supply Pressure ~~(PS-23-68 (A-D))~~	≥70 psig	Note 2 2.d
3.d 2 (Notes 11, 12) A.5 A.11	~~Main Steam Line Tunnel Temperature~~ HIGH A.1 ~~(TS-23-(101-104)A)~~	~~≤212°F~~ ≤ 200°F M.7	Note 2 2.d
3.e 1 (Notes 12, 12) A.5 A.11	Time Delay ~~(23A-K48) (23A-K49)~~	≤35 minutes	Note 2 2.d
~~1~~ A.11	~~Trip System Logic~~		~~Note 3~~ L.4

HIGH MAIN STEAM TUNNEL TEMPERATURE A.1

L.1

(a) With reactor coolant temperature > 212 °F A.2

(c) With reactor steam pressure > 150 psig A.2

TABLE 3.2.2
INSERT "C"

APPLICABLE MODES
OR OTHER
SPECIFIED
CONDITIONS

3.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
3.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
3.c	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]
3.d	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
3.e	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS [A.1]

[A.1]

INSERT "D" [A.2] VYNPS

[A.1]

TABLE 3.2.2
(Cont'd)

PRIMARY CONTAINMENT ~~REACTOR CORE ISOLATION COOLING SYSTEM~~ ISOLATION INSTRUMENTATION

[A.1] Actions Referenced from Action Note 1

[A.1] 4. Reactor Core Isolation Cooling (RCIC) System Isolation

	~~Minimum Number of Operable Instrument Channels per Trip System~~ REQUIRED [A.1]	Trip Function (HIGH MAIN STEAM LINE TUNNEL TEMPERATURE [A.1])	Trip ~~Level~~ Setting [A.1]	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~ [A.1]
4.a	2 (Notes ~~11~~, 12) [A.5] [A.11]	HIGH [A.1] ~~Main Steam Line Tunnel~~ Temperature ~~(TS-13-(79-82)A)~~	~~≤212°F~~ ≤ 200°F [M.7]	Note ~~3~~ 2.d [M.4]
4.b	1 (Notes ~~11~~, 12) [A.5] [A.11]	Time Delay ~~(13A-K41) (13A-K42)~~	≤35 minutes	Note ~~3~~ 2.d [M.4]
4.c	~~2 per set of 4~~ 6 [A.16] (Notes ~~11~~, 12) [A.5] [A.11]	High Steam Line Space Temperature ~~(TS-13-(79-82)(B,C,D))~~ [LA.1]	~~≤212°F~~ ≤ 196°F [M.7]	Note ~~3~~ 2.d [M.4]
4.d	1 (Notes ~~11~~, 12) [A.5] [A.11]	High Steam Line d/p (Steam Line Break) ~~(DPIS-13-83/84)~~	≤195 inches of water	Note ~~3~~ 2.d [M.4]
4.f	4 (Notes ~~3~~, ~~12~~, 13) [A.5] [LA.7] [A.11]	Low Steam Supply Pressure ~~(PS-13-87(A-D))~~	≥50 psig	Note ~~3~~ 2.d [M.4]
	~~2~~ [L.4]	~~Trip System Logic~~ [L.4]	~~--~~	~~Note 3~~ [L.4]
4.e	1 (Notes ~~11~~, 12) [A.5] [A.11]	Time Delay ~~(13A-K7) (13A-K31)~~ (HIGH STEAM LINE d/p [A.1])	3≤ t ≤7 seconds	Note ~~3~~ 2.d [M.4]

[L.1] (a) With reactor coolant temperature > 212°F [A.2]

(c) With reactor steam pressure > 150 psig [A.2]

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TABLE 3.2.2
INSERT "D"

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
4.a	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
4.b	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
4.c	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
4.d	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
4.e	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, Refuel[a]
4.f	RUN, STARTUP/HOT STANDBY[c], HOT SHUTDOWN[c], Refuel[c]

A.1

A.1

ACTION

TABLE 3.2.2 NOTES

M.3

1. The main steam line low pressure need be available only in the "Run" mode. A.13

L.3 L.5

ADD ACTION NOTE 2.a FROM INSERT

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 actions listed below shall be taken:~~ A.19

LA.4

SEE ACTION NOTE 2.b ON INSERT

A) ~~Initiate an orderly shutdown and have reactor in the cold shutdown condition in 24 hours.~~ L.4

LA.4

SEE ACTION NOTE 2.c ON INSERT

B) ~~Initiate an orderly load reduction and have reactor in "Hot Standby" within 8 hours.~~

SEE ACTION NOTE 2.d ON INSERT

3) ~~Close isolation valves in system and comply with Specification 3.5.~~ A.17

L.4

M.4 L.5

4) ~~Deleted.~~

5. One trip system arranged in a one-out-of-two twice logic. LA.7

6. The main steam line high flow is available only in the "Refuel," "Shutdown," and "Startup" modes. A.14

7. ~~Deleted.~~

8. ~~Deleted~~ A.1

9. ~~Deleted.~~

A.15 LA.5

10. A key lock switch is provided to permit the bypass of this trip function to enable plant startup and shutdown when the condenser vacuum is greater than 12 inches Hg absolute provided that both turbine stop and bypass 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. A.5

A.2

SEE ACTION NOTE 1 ON INSERT

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:~~ LA.6

A.2

SEE ACTION NOTE 1.b ON INSERT

A.18

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.~~

A.2

SEE ACTION NOTE 1.a ON INSERT

L.5

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.

ACTION A.1

TABLE 3.2.2 NOTES (Cont'd)

A.2 SEE ACTION NOTE 1 ON INSERT

~~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:~~

SEE ACTION NOTE 1.b ON INSERT A.2 A.18

~~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.~~

SEE ACTION NOTE 1.a ON INSERT L.5 A.2 M.5

~~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.~~

A.2

INSERT FOR TABLE 3.2.2 ACTION NOTES MARK-UP
PAGES 48, 48a

1. WITH ONE OR MORE REQUIRED PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION CHANNELS INOPERABLE, TAKE ALL OF THE APPLICABLE ACTIONS IN NOTES 1.a AND 1.b BELOW

   a. WITH ONE OR MORE TRIP FUNCTIONS WITH ONE OR MORE REQUIRED CHANNELS INOPERABLE:

      1) FOR TRIP FUNCTIONS 2.a AND 2.b, PLACE ANY INOPERABLE CHANNEL IN TRIP WITHIN 12 HOURS; AND

      2) FOR TRIP FUNCTIONS 3.e, 4.b AND 4.e, RESTORE ANY INOPERABLE CHANNEL TO OPERABLE STATUS WITHIN 24 HOURS; AND M.5

      3) FOR ALL OTHER TRIP FUNCTIONS, PLACE ANY INOPERABLE CHANNEL IN TRIP WITHIN 24 HOURS

   b. WITH ONE OR MORE TRIP FUNCTIONS WITH ISOLATION CAPABILITY NOT MAINTAINED:

      1) RESTORE ISOLATION CAPABILITY WITHIN 1 HOUR.

L.5

PENETRATION FLOW PATHS, ISOLATED AS A RESULT OF COMPLYING WITH THE ABOVE ACTIONS, MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROLS.

A.2 IF ANY APPLICABLE AND ASSOCIATED COMPLETION TIME OF NOTE 1.a OR 1.b IS NOT MET, TAKE THE APPLICABLE ACTIONS OF NOTE 2 BELOW AND REFERENCED IN TABLE 3.2.2. FOR THE CHANNEL.

2.a ISOLATE THE ASSOCIATED MAIN STEAM LINE WITHIN 12 HOURS (PENETRATION FLOW PATHS MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROL); OR PLACE THE REACTOR IN HOT SHUTDOWN WITHIN 12 HOURS AND PLACE THE REACTOR IN COLD SHUTDOWN WITHIN THE NEXT 12 HOURS.

M.3 L.3 L.5

LA.4

b. PLACE THE REACTOR IN COLD SHUTDOWN WITHIN 24 HOURS

c. PLACE THE REACTOR IN STARTUP/HOT STANDBY WITHIN 8 HOURS. M.4

d. ISOLATE THE AFFECTED PENETRATION FLOW PATH WITHIN 1 HOUR (PENETRATION FLOW PATHS MAY BE UNISOLATED INTERMITTENTLY UNDER ADMINISTRATIVE CONTROL).

L.5

A1

PRIMARY CONTAINMENT ISOLATION A.7

TABLE 4.2.~~1~~ 2 A.1
(Cont'd)

A.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

B.1

5. Residual Heat Removal Shutdown Cooling Isolation

A.1

Low Pressure Coolant Injection System

A.1

Trip Function	Functional Test (8) A.21	Calibration (8) A.21	Instrument Check
Low Reactor Pressure (PT-2-3-56C/D(M))	Every Three Months	Once/Operating Cycle	--
High Drywell Pressure (PT-10-101A-D(M))	Every Three Months	Once/Operating Cycle	Once Each Day
Low-Low Reactor Vessel Water Level	Every Three Months	Once/Operating Cycle	Once Each Day
Reactor Vessel Shroud Level	Every Three Months	Once/Operating Cycle	--
A1 5.a ~~Low~~ High A6 Reactor Pressure (PS-2-128A/B) LA.1	Every Three Months	Every Three Months	~~--~~ NA A.1
RHR Pump Discharge Pressure	Every Three Months	Every Three Months	--
High Drywell Pressure (PT-10-101A-D(S1))	Every Three Months	Once/Operating Cycle	--
Low Reactor Pressure (PT-2-3-56A/B)(M) & 52C/D(M))	Every Three Months	Once/Operating Cycle	--
Auxiliary Power Monitor	Every Three Months	None	Once Each Day
Pump Bus Power Monitor	Every Three Months	None	Once Each Day
SEE SR 4.2.B.2 ~~Trip System Logic~~	~~Once/Operating Cycle~~	~~Once/Operating Cycle (Note 3)~~ A.20	~~--~~ A.23

A.9 A.9

A.1

A.10

A.1

TABLE 4.2.2

MINIMUM TESTS AND CALIBRATION FREQUENCIES

PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

A.1 A.21 A.1 A.1

1. Main Steam Line Isolation

Trip Function	Functional Test (S)	Calibration (S)	Instrument Check
1.a Low-Low Reactor Vessel Water Level A.1	Every Three Months	Once/Operating Cycle	Once Each Day
1.b High MAIN Steam Line Area Temperature A.1	Every Three Months	Each Refueling Outage EVERY 3 MONTHS (a) M.6	(1) NA A.1
1.c, 1.e High MAIN Steam Line Flow " " " " " — NOT IN RUN	Every Three Months " " "	Once/Operating Cycle " " "	Once Each Day " "
1.d Low Main Steam Line Pressure	Every Three Months	Every Three Months	(1) NA A.1
2.a Low Reactor Vessel Water Level A.1	Every Three Months	Once/Operating Cycle	(1) NA A.1
2.b High Drywell Pressure	Every Three Months	Once/Operating Cycle	Once Each Day
1.f Condenser Low Vacuum	Every Three Months	Every Three Months	(1) NA A.1
SEE SR 4.2.B.2 ~~Trip System Logic~~	~~Once/Operating Cycle (Note 2)~~ LA.8	~~Once/Operating Cycle (Note 3)~~ A.20	~~(1)~~ A.23

2. Primary Containment Isolation A.1

(a) TRIP UNIT CALIBRATION ONLY M.6

A.1

A.1

A.1

TABLE 4.2.2
(Cont'd)

PRIMARY CONTAINMENT

A.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION INSTRUMENTATION

3. High Pressure Coolant Injection (HPCI) System Isolation

A.2

	Trip Function	Functional Test (8) A.21	Calibration (8) A.21 A.1	Instrument Check A.1
3.a	High Steam Line Space Temperature	Every Three Months	Each refueling outage	(-) NA A.1
3.b	High Steam Line D/P (Steam Line Break)	Every Three Months	Every three months	(-) NA A.1
3.c	Low HPCI Steam Supply Pressure	Every Three Months	Every three months	(-) NA A.1
3.d	Main Steam Line Tunnel Temperature	Every Three Months	Each refueling outage	(-) NA A.1
SEE SR 4.2.8.2	~~Trip System Logic~~	~~Once/operating cycle~~	Once/operating cycle (Note 2) A.22	~~(-)~~ A.23
3.e A.1	High Main Line Tunnel Temperature Time Delay			

A.1

TABLE 4.2.2
(Cont'd)

A.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

A.1 PRIMARY CONTAINMENT

A.1

REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION INSTRUMENTATION

4. Reactor Core Isolation Cooling (RCIC) System Isolation

A.1	Trip Function	Functional Test (8) A.21	Calibration (8) A.21	A.1 Instrument Check
4.a	HIGH Main Steam Line Tunnel Temperature	Every Three Months	Each refueling outage A.1	TT NA A.1
4.c	High Steam Line Space Temperature	Every Three Months	Each refueling outage	IT NA A.1
4.d 4.e	High Steam Line d/p including time delay relays (Steam Line Break)	Every Three Months	Every three months	TT NA A.1
4.f	Low RCIC Steam Supply Pressure	Every Three Months	Every three months A.23	TT NA A.1
SEE 3.8.4.2.6.2	~~Trip System Logic~~	~~Once/operating cycle~~	Once/operating cycle (Note 3)	A.22
4.b A.1	High Main Steam Line Tunnel Temperature Time Delay			

A.1

TABLE 4.2 NOTES

1. ~~Not used.~~ A.1

LA.8

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart.

3. Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system. A.22

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.9

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

A.21

8. Functional tests and calibrations are not required when systems are not required to be operable.

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.9

Vermont Yankee Nuclear Power Station

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Tab 3.E

RB Ventilation Isolation and SBGT System Initiation

A.1

2. Perform a Logic System Functional Test of reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation once every operating cycle.

A.2

3.2 LIMITING CONDITIONS FOR OPERATION	4.2 SURVEILLANCE REQUIREMENTS
3.2 PROTECTIVE INSTRUMENT SYSTEMS	**4.2 PROTECTIVE INSTRUMENT SYSTEMS**
Applicability:	**Applicability:**
Applies to the operational status of the plant instrumentation systems which initiate and control a protective function.	Applies to the surveillance requirements of the instrumentation systems which initiate and control a protective function.
Objective:	**Objective:**
To assure the operability of protective instrumentation systems.	To verify the operability of protective instrumentation systems.
Specification:	**Specification:**
A. Emergency Core Cooling System	**A. Emergency Core Cooling System**
When the system(s) it initiates or controls is required in accordance with Specification 3.5, the instrumentation which initiates the emergency core cooling system(s) shall be operable in accordance with Table 3.2.1.	Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.1.
B. Primary Containment Isolation	**B. Primary Containment Isolation**
When primary containment integrity is required, in accordance with Specification 3.7, the instrumentation that initiates primary containment isolation shall be operable in accordance with Table 3.2.2.	Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.2.
	{Move to separate pages} A.1
	A.1 1. The reactor building ventilation isolation and Standby Gas Treatment System initiation
C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation	**C. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation**
~~The instrumentation that initiates the isolation of the reactor building ventilation system and the actuation of the standby gas treatment system~~ shall be operable in accordance with Table 3.2.3.	~~Instrumentation and logic systems~~ shall be ~~functionally~~ tested and calibrated as indicated in Table 4.2.3. checked A.2 A.3
The reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation for each Trip Function in Table 3.2.3	When a channel is placed in an inoperable status solely for performance of required instrumentation surveillances, entry into the associated Limiting Conditions for Operation may be delayed for up to 6 hours provided the associated Trip Function maintains reactor building ventilation isolation capability and Standby Gas Treatment System initiation capability. A.4

A.1

A.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

INSTRUMENTATION A.1

Actions When Required Channels are Inoperable A.5

TABLE 3.2.3

REACTOR BUILDING VENTILATION ISOLATION & STANDBY GAS TREATMENT SYSTEM INITIATION

A.1 REQUIRED

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
1. 2 (Notes 2 3)	Low Reactor Vessel Water Level ~~(LT-2-3-57A/B(M), LT-2-3-58A/B(M))~~	~~Same as PCIS~~ ≥ 127.0 inches A.1	Note 1
2. 2 (Notes 2 3)	High Drywell Pressure ~~(PT-5-12(A-D)(M))~~ LA.1	~~Same as PCIS~~ ≤ 2.5 psig A.1	Note 1
3. 1 (Notes 2 3)	Reactor Building ~~Vent~~ Ventilation Radiation High ~~(RM-17-452A/B)~~ A.6	≤14 mR/hr	Note 1
4. 1 (Notes 2 3)	Refueling Floor Zone Radiation ~~(RM-17-453A/B)~~ LA.1	≤100 mR/hr	Note 1
~~1~~	~~Reactor Building Vent Trip System Logic~~	~~--~~	~~Note 1~~
~~1~~	~~Standby Gas Treatment Trip System Logic~~	~~--~~	~~Note 1~~

A.1 A.4 A.5 L.3

VENTILATION A.6

A.8

1. RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL (a)(b)
2. RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL (a)
3. RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL (a)(b)(c)(d)
4. RUN, STARTUP, HOT STANDBY, HOT SHUTDOWN, REFUEL (a)(b)(c)(d)

A.1

(a) With reactor coolant temperature > 212°F
(b) During operations with potential for draining the reactor vessel.
(c) During movement of irradiated fuel assemblies or fuel cask in secondary containment.
(d) During Alteration of the Reactor Core

A.8 L.2

A.1

ACTION A.1

A.1

TABLE 3.2.3 NOTES

Action Note 1.

1. If the minimum number of operable instrument channels is not available in either trip system, the reactor building ventilation system shall be isolated and the standby gas treatment system operated ~~until the instrumentation is repaired.~~ within 1 hour A.7 A.1 M.1

A.1 <Moved to proposed SR 4.2.B.1>

2. 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 Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation. A.4

3. Whenever Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation are required by Specification 3.7.B and 3.7.C, ~~there shall be two operable or tripped trip systems for each Trip Function,~~ except as provided for below: A.8 LA.2 L.1 L.2

A.1 Action Note 1.b a. With one or more automatic functions with isolation capability not maintained restore isolation and initiation capability in 1 hour or take the ACTION required by Table 3.2.3. A.7

A.1 Action Note 1.a b. With one or more channels inoperable, place the inoperable channel(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 3.2.3. A.7

A.1

A.1

TABLE 4.2.3

~~MINIMUM~~ TESTS AND ~~CALIBRATION~~ FREQUENCIES

A.1

INITIATION

REACTOR BUILDING VENTILATION AND STANDBY GAS TREATMENT SYSTEM ~~ISOLATION~~

ISOLATION A.1

A.1

A.1 Trip Function	Functional Test (5) A.9	Calibration (5) A.9 A.1	~~Instrument~~ Check A.1
1. Low Reactor Vessel Water Level	Every Three Months	~~Once/Operating Cycle~~ Every 3 Months (a) M.2	~~NA~~ NA A.1
2. High Drywell Pressure	Every Three Months	~~Once/Operating Cycle~~	~~NA~~ NA A.1
3. Reactor Building ~~Exhaust~~ Ventilation Radiation High A.6 A.6	Every Three Months	Every Three Months	Once Each Day
4. Refueling Floor Zone Radiation	Every Three Months	Every Three Months	Once Each Day During Refueling
SEE SR 4.2.C.2 ~~Reactor Building Vent Trip System Logic~~	~~Once/Operating Cycle~~ A.12	~~Once/Operating Cycle (Note 3)~~	~~—~~ A.2
SEE SR 4.2.C.2 ~~Standby Gas Treatment Trip System Logic~~	~~Once/Operating Cycle~~ A.12	~~Once/Operating Cycle (Note 3)~~ A.10	

(a) Trip unit calibration only M.2

A.1

TABLE 4.2 NOTES

1. Not used. A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart. A.11

3. Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system. A.10

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.11

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

8. Functional tests and calibrations are not required when systems are not required to be operable. A.9

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.11

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Tab 3.F

Off-Gas System Initiation (Deleted)

3.2 LIMITING CONDITIONS FOR OPERATION	4.2 SURVEILLANCE REQUIREMENTS
D. ~~Off-Gas System Isolation~~ R.1 Deleted ~~During reactor power operation, the instrumentation that initiates isolation of the off-gas system shall be operable in accordance with Table 3.2.4.~~	D. ~~Off-Gas System Isolation~~ Deleted ~~Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.4.~~ R.1 <MOVE TO SEPARATE PAGE> A.1
E. Control Rod Block Actuation During reactor power operation the instrumentation that initiates control rod block shall be operable in accordance with Table 3.2.5.	E. Control Rod Block Actuation Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.5. A.2
F. Mechanical Vacuum Pump Isolation Instrumentation When the reactor is in the RUN or STARTUP/HOT STANDBY Mode and the mechanical vacuum pump is in service, four (4) channels of the High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be operable, except as provided below. 1. With one or more channels inoperable, within 12 hours: a. Restore the inoperable channel(s) to operable status; or b. Place the inoperable channel(s) or associated trip system in the trip condition (not applicable if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve).	F. Mechanical Vacuum Pump Isolation Instrumentation The High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be checked, functionally tested and calibrated as indicated in Surveillance Requirements 4.2.F.1, 2, 3, 4 and 5. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required actions may be delayed for up to six (6) hours provided the associated trip function maintains mechanical vacuum pump isolation capability. 1. Perform an instrument check once each day. 2. Perform an instrument functional test once every three (3) months.

<MOVE TO SEPARATE PAGE> A.1

TABLE 3.2.4

OFF-GAS SYSTEM ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Setting	Required Action When Minimum Conditions For Operation Are Not Satisfied
1	Time Delay (Stack Off-Gas Valve Isolation) (15TD & 16TD)	≤ 2 minutes ≤ 30 minutes	Note 1
1	Trip System Logic	--	Note 1

Note 1 - At least one of the radiation monitors between the charcoal bed system and the plant stack shall be operable during operation of the augmented off-gas system. If this condition cannot be met, continued operation of the augmented off-gas system is permissible for a period of up to 7 days provided that at least one of the stack monitoring systems is operable and off-gas system temperature and pressure are measured continuously.

R.1

TABLE 4.2.4

MINIMUM TEST AND CALIBRATION FREQUENCIES

OFF-GAS SYSTEM ISOLATION INSTRUMENTATION

Trip Function	Functional Test(8)	Calibration(8)	Instrument Check
Augmented Off-Gas Trip System Logic (AOG)	Once/Operating Cycle (Note 2)	Once/Operating Cycle (Note 3)	--

R.1

TABLE 4.2 NOTES

1. ~~Not used.~~ A.1

2. ~~During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart.~~ R.1

3. ~~Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.~~

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.2

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

8. ~~Functional tests and calibrations are not required when systems are not required to be operable.~~ R.1

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.2

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Tab 3.G

Control Rod Block Actuation

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

D. Off-Gas System Isolation

During reactor power operation, the instrumentation that initiates isolation of the off-gas system shall be operable in accordance with Table 3.2.4.

E. Control Rod Block Actuation

A.3 During reactor power operation, ~~the instrumentation that initiates control rod block~~ shall be operable in accordance with Table 3.2.5.

A.1 THE CONTROL ROD BLOCK INSTRUMENTATION FOR EACH TRIP FUNCTION IN TABLE 3.2.5

F. Mechanical Vacuum Pump Isolation Instrumentation

When the reactor is in the RUN or STARTUP/HOT STANDBY Mode and the mechanical vacuum pump is in service, four (4) channels of the High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be operable, except as provided below.

1. With one or more channels inoperable, within 12 hours:

   a. Restore the inoperable channel(s) to operable status; or

   b. Place the inoperable channel(s) or associated trip system in the trip condition (not applicable if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve).

4.2 SURVEILLANCE REQUIREMENTS

D. Off-Gas System Isolation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.4. A.2

A.1 1. THE CONTROL ROD BLOCK

E. Control Rod Block Actuation

~~Instrumentation and logic systems shall be~~ functionally tested and calibrated as indicated in Table 4.2.5. A.4

F. Mechanical Vacuum Pump Isolation Instrumentation

The High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be checked, functionally tested and calibrated as indicated in Surveillance Requirements 4.2.F.1, 2, 3, 4 and 5.

When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required actions may be delayed for up to six (6) hours provided the associated trip function maintains mechanical vacuum pump isolation capability.

1. Perform an instrument check once each day.

2. Perform an instrument functional test once every three (3) months.

A.1 <MOVE TO SEPARATE PAGE>

A.5 WHEN A ROD BLOCK MONITOR CHANNEL IS PLACED IN AN INOPERABLE STATUS SOLELY FOR PERFORMANCE OF REQUIRED 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 CONTROL ROD BLOCK INITIATION CAPABILITY.

A.1

VYNPS

TABLE 3.2.5

CONTROL ROD BLOCK INSTRUMENTATION

A.1 Applicable Modes or other Specified Conditions

	Required Channels (A.1 Per Trip Function)		Trip Function	Modes in Which Function Must be Operable (A.1): Refuel	Startup	Run	Trip Setting	A.6 Actions when required channels are inoperable
	A.6		Rod Block Monitor (RBM A/B) LA.1				LA.3 (b)	A.6
1.a	(Notes 8 and 10) A.5	2	a. Upscale (Flow Bias) (Note 7) A.3			X	≤0.66(W-ΔW)+N with a maximum as defined in the COLR (Note 5) LA.3	NOTE 1
1.b		2	b. Downscale (Note 7) LA.2			X	≥2/125 Full Scale	NOTE 1
1.c		2	c. Inop (Note 7)			X		NOTE 1
2	(Note 12) A.6	2	Reactor Mode Switch - Shutdown Position (Note 12) A.3					NOTE 2
	~~(Note 8)~~	~~1~~	~~Trip System~~	~~X~~	~~X~~	~~X~~		A.4

A.1 A.1 A.3 A.1 A.6

A.3
(a) when reactor mode switch is in shutdown position

LA.3
(b) Trip setting ≤ 0.66 (W-ΔW) + N for single loop operation.

1.a	>30% rated thermal power	A.3
1.b	>30% rated thermal power	
1.c	>30% rated thermal power	

A.1

A.1 ACTION

TABLE 3.2.5 NOTES

1. Deleted.

2. Deleted.

3. Deleted.

4. Deleted.

A.1

LA.3

LA.3

TABLE 3.2.5 FUNCTION 1.a TRIP SETTING

5. "W" is percent rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 x 10^6 lbs/hr core flow. Refer to the Core Operating Limits Report for acceptable values for N. ΔW is the difference between the two loop and single loop drive flow at the same core flow. This difference must be accounted for during single loop operation. ΔW = 0 for two recirculation loop operation and = 8% for single loop operation.

LA.3

6. Not used. A.1

A.3

7. The trip may be bypassed when the reactor power is ≤30% of Rated Thermal Power. An RBM channel will be considered inoperable if there are less than half the total number of normal inputs from any LPRM level.

LA.2

A.6

8. With the number of operable channels less than the required number, place the inoperable channel in the tripped condition within one hour.

A.4

SEE ACTION NOTE 1

9. With one or two RBM channels inoperable: Take all of the applicable Actions in Notes 1.a and 1.b below.

A.6

A.6

a. Deleted.

SEE ACTION NOTE 1.a

b. If one RBM channel is inoperable, restore the inoperable channel to operable status within 24 hours; and

A.6

SEE ACTION NOTE 1.b

c. If the required action and associated completion time of Note ~~9.b~~ 1.a above is not met, or if two RBM channels are inoperable, place one RBM channel in the tripped condition within the next hour.

A.6

10. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required action notes may be delayed for up to 6 hours provided the associated Trip Function maintains Control Rod Block initiation capability.

A.5

11. Deleted. A.1

12. Required to be operable when the reactor mode switch is in the shutdown position.

A.3

SEE ACTION NOTE 2

13. With one or more Reactor Mode Switch - Shutdown Position channels inoperable, immediately suspend control rod withdrawal and immediately initiate actions to fully insert all insertable control rods in core cells containing one or more fuel assemblies.

A.6

A.1

A.1

TABLE 4.2.E

MINIMUM TEST AND CALIBRATION FREQUENCIES

CONTROL ROD BLOCK INSTRUMENTATION

Trip Function	Functional Test	Calibration
Rod Block Monitor (RBM) A.1		(b) L.2
a. Upscale (Flow Bias)	Every Three Months ~~(Note 4)~~	Every Three Months (Note 13) (c)
b. Downscale	Every Three Months (Note 4) A.8	Every Three Months (b) L.2
c. Inop	Every Three Months	A.1 NA
~~Trip System Logic~~	~~Once/Operating Cycle~~ FOOTNOTE	~~Once/Operating Cycle (Note 3)~~ A.7 A.4
Reactor Mode Switch - Shutdown Position	Every Refueling Outage ~~(Note 12)~~ (a) M.1	

(b) NEUTRON DETECTORS ARE EXCLUDED L.2

(a) Required to be completed within 1 hour after the reactor mode switch is placed in the shutdown position. M.1

(c) Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power A.10

A.1

TABLE 4.2 NOTES

1. ~~Not used.~~ A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart. A.9

3. ~~Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.~~ A.7

4. ~~This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.~~ A.8

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

8. Functional tests and calibrations are not required when systems are not required to be operable.

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle. A.9

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

A.4

M.1

SEE TABLE 4.2.5 FOOTNOTE (a)

12. ~~Trip system logic testing is not applicable to this function.~~ ~~If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.~~ A.1

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

TABLE 4.2.5 FOOTNOTE (c) A.10

Required to be completed within 1 hour after the reactor mode switch is placed in the shutdown position.

M.1

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Tab 3.H

Mechanical Vacuum Pump Isolation

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

D. Off-Gas System Isolation

During reactor power operation, the instrumentation that initiates isolation of the off-gas system shall be operable in accordance with Table 3.2.4.

E. Control Rod Block Actuation

During reactor power operation the instrumentation that initiates control rod block shall be operable in accordance with Table 3.2.5.

F. Mechanical Vacuum Pump Isolation Instrumentation

A.1 1. When the reactor is in the RUN or STARTUP/HOT STANDBY Mode and the mechanical vacuum pump is in service, ~~four~~ (4) channels of the High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be operable ~~except as provided below~~.

a. ~~1~~. With one or more channels inoperable ~~within 12 hours~~:

1) ~~a~~. Restore the inoperable channel(s) to operable status ~~; or~~ WITHIN 12 HOURS

2) ~~b~~. Place the inoperable channel(s) or associated trip system in the trip condition (not applicable if the inoperable channel is the result of an inoperable mechanical vacuum pump isolation valve).

A.1

2. IF SPECIFICATION 3.2.F.1 IS NOT MET, TAKE ALL OF THE APPLICABLE ACTIONS IN SPECIFICATIONS 3.2.F.2.a AND 2.b BELOW.

4.2 SURVEILLANCE REQUIREMENTS

D. Off-Gas System Isolation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.4.

A.2

<MOVE TO SEPARATE PAGE> A.1

E. Control Rod Block Actuation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.5.

A.2

F. Mechanical Vacuum Pump Isolation Instrumentation

A.1 1. The High Main Steam Line Radiation Trip Function for mechanical vacuum pump isolation shall be checked, functionally tested and calibrated as indicated in ~~Surveillance Requirements~~ 4.2.F.1.a, b, c, d and e.

A.1

When ~~a channel is placed~~ in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed for up to ~~six~~ (6) hours provided the associated Trip Function maintains mechanical vacuum pump isolation capability.

a. ~~a~~. Perform an Instrument Check once each day.

b. ~~b~~. Perform an Instrument Functional Test once every ~~three~~ (3) months.

A.1

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

A.1

b. ~~7~~. If the required ~~A~~action and associated completion time of Specification 3.2.F.~~7~~ 2.a ABOVE is not met, ~~within the following 12 hours~~:

1) ~~a~~ Isolate the mechanical vacuum pump; or

2) ~~b~~ Isolate the main steam lines; or

3) ~~c~~ Place the reactor in the SHUTDOWN Mode.

WITHIN 12 HOURS

OR IF MECHANICAL VACUUM PUMP ISOLATION CAPABILITY IS NOT MAINTAINED:

M.1

4.2 SURVEILLANCE REQUIREMENTS

A.1

c. ~~a~~. Perform an ~~I~~instrument ~~C~~calibration, except for the radiation detectors, using a current source once every ~~three~~ (3) months. The ~~T~~trip ~~S~~setting shall be ≤ 3.0 ~~times~~ (X) background at rated thermal power.

d. ~~b~~. Perform an ~~I~~instrument ~~C~~calibration using a radiation source once each ~~R~~refueling ~~O~~outage.

e. ~~c~~. Perform a ~~L~~logic ~~S~~system ~~F~~functional ~~T~~test, including mechanical vacuum pump isolation valve, once ~~each~~ EVERY ~~O~~operating ~~C~~cycle.

G. Post-Accident Instrumentation

During reactor power operation, the instrumentation that displays information in the Control Room necessary for the operator to initiate and control the systems used during and following a postulated accident or abnormal operating condition shall be operable in accordance with Table 3.2.6.

G. Post-Accident Instrumentation

The post-accident instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.6.

A.2

MOVE TO SEPARATE PAGE

A.1

H. Drywell to Torus ΔP Instrumentation

1. During reactor power operation, the Drywell to Torus ΔP Instrumentation (recorder #1-156-3 and instrument DPI-1-158-6) shall be operable except as specified in 3.2.H.2.

2. From and after the date that one of the Drywell to Torus ΔP instruments is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding thirty days unless the instrument is

H. Drywell to Torus ΔP Instrumentation

The Drywell to Torus ΔP Instrumentation shall be calibrated once every six months and an instrument check will be made once per shift.

A.2

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Tab 3.I

Post-Accident Monitoring Instrumentation

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

2. If the required action and associated completion time of Specification 3.2.F.1 is not met, within the following 12 hours:

   a. Isolate the mechanical vacuum pump; or

   b. Isolate the main steam lines; or

   c. Place the reactor in the SHUTDOWN Mode.

A.1 <MOVE TO SEPARATE PAGE>

A.1

G. Post-Accident Monitoring Instrumentation

During reactor power operation, A.5 ~~the instrumentation that displays information in the Control Room necessary for the operator to initiate and control the systems used during and following a postulated accident or abnormal operating condition~~ the post-accident monitoring instrumentation for each function in Table 3.2.6 A.7 shall be operable in accordance with Table 3.2.6.

Drywell to Torus ΔP Instrumentation

1. During reactor power operation, the Drywell to Torus ΔP Instrumentation (recorder #1-156-3 and instrument DPI-1-158-6) shall be operable except as specified in 3.2.H.2.

2. From and after the date that one of the Drywell to Torus ΔP instruments is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding thirty days unless the instrument is

4.2 SURVEILLANCE REQUIREMENTS

3. Perform an instrument calibration, except for the radiation detectors, using a current source once every three (3) months. The trip setting shall be ≤ 3.0 times background at rated thermal power.

4. Perform an instrument calibration using a radiation source once each refueling outage.

5. Perform a logic system functional test, including mechanical vacuum pump isolation valve, once each operating cycle.

G. Post-Accident Monitoring Instrumentation A.1

The post-accident monitoring instrumentation shall be ~~functionally tested~~ checked A.2 and calibrated in accordance with Table 4.2.6.

A.3

H. Drywell to Torus ΔP Instrumentation

The Drywell to Torus ΔP Instrumentation shall be calibrated once every six months and an instrument check will be made once per shift.

When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required Actions may be delayed for up to 6 hours.

A.4

A.1 APPLICABLE MODES AND OTHER SPECIFIED CONDITIONS

A.1 Required Channels per Function

A.1 A.1

VYNPS

TABLE 3.2.6

MONITORING A.1

A.1 ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE

A.1 POST-ACCIDENT INSTRUMENTATION

LA.1

Function A.4 A.1

	Minimum Number of Operable Instrument Channels ~~(Note 8)~~	~~Parameter~~	~~Type of Indication~~	~~Instrument Range~~	
RUN, STARTUP/HOT STANDBY	2	1. Drywell Atmospheric Temperature ~~(Notes 1 and 3)~~ A.1	~~Recorder #TR-16-19-45 (Blue)~~ ~~Meter #TI-16-19-30B~~	~~0-350°F~~ ~~0-350°F~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	2. Drywell A.8 ~~Containment~~ Pressure ~~(Notes 1 and 3)~~ A.1	~~Meter #PI-16-19-12A~~ ~~Meter #PI-16-19-12B~~	~~(-15) - (+260) psig~~ ~~(-15) - (+260) psig~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	3. Torus Pressure ~~(Notes 1 and 3)~~ A.1	~~Meter #PI-16-19-36A~~ ~~Meter #PI-16-19-36B~~	~~(-15) - (+~~~~65~~~~) psig~~ 85 ~~(-15) - (+~~~~65~~~~) psig~~ 85 A.9	NOTE 1
RUN, STARTUP/HOT STANDBY	2	4. Torus Water Level ~~(Notes 1 and 3)~~ A.1	~~Meter #LI-16-19-12A~~ ~~Meter #LI-16-19-12B~~	~~0-25 ft.~~ ~~0-25 ft.~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	5. Torus Water Temperature ~~(Notes 1 and 3)~~ A.1	~~Meter #TI-16-19-33A~~ ~~Meter #TI-16-19-33C~~	~~0-250°F~~ ~~0-250°F~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	6. Reactor Pressure ~~(Notes 1 and 3)~~ A.1	~~Meter #PI-2-3-56A~~ ~~Meter #PI-2-3-56B~~	~~0-1500 psig~~ ~~0-1500 psig~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	7. Reactor Vessel Water Level ~~(Notes 1 and 3)~~ A.1	~~Meter #LI-2-3-91A~~ ~~Meter #LI-2-3-91B~~	~~(-200)-0-(+200) "H_2O~~ ~~(-200)-0-(+200) "H_2O~~	NOTE 1
RUN, STARTUP/HOT STANDBY	2	8. Torus Air Temperature ~~(Notes 1 and 3)~~ A.1	~~Recorder #TR-16-19-45 (Red)~~ ~~Meter #TI-16-19-41~~	~~0-350°F~~ ~~50-300°F~~	NOTE 1
A.5	~~2/valve~~	~~Safety/Relief Valve Position From Pressure Switches (Notes 1 and 3)~~	~~Lights RV-2-71(A-D) From PS-2-71-(1-8)(A-D)~~	~~Closed - Open~~ R.1	A.1
RUN, STARTUP/HOT STANDBY	2	9. Containment High Range Radiation Monitor			NOTE 2

A.1

A.1

VYNPS
TABLE 3.2.6
(Cont'd)

POST-ACCIDENT INSTRUMENTATION

Minimum Number of Operable Instrument Channels (Note 9) A.4	Parameter	Type of Indication	Instrument Range LA.1
1/valve	Safety Valve Position From Acoustic Monitor (Note 5)	Meter ZI-2-1A/B	Closed - Open R.1
2 (A.1 9.)	Containment High-Range Radiation Monitor (Note 2 A.1)	Meter RM-16-19-1A/B	1 R/hr-10^7 R/hr LA.1
1	Stack Noble Gas Effluent (Note 7)	Meter RM-17-155	0.1 - 10^7 mR/hr R.1

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A.1

A.1

ACTION A.1

TABLE 3.2.6 NOTES

Note 1 - Within 30 days following the loss of one indication, restore the inoperable channel to an operable status or a special report to the Commission must be prepared and submitted within the subsequent 14 days, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.

TABLE 3.2.6 ACTION NOTE 1.a A.1

Note 2 - Deleted A.1

Note 3 - Within 7 days following the loss of both indications, restore at least one required channel to an operable status or place the reactor in a hot shutdown condition within the following 12 hours.

TABLE 3.2.6 ACTION NOTE 1.b A.1

Note 4 - Deleted A.1

R.1

Note 5 - From and after the date that safety valve position from the acoustic monitor is unavailable, reactor operation may continue for 30 days provided safety valve position can be determined by monitoring safety valve discharge temperature and primary containment pressure. If after 30 days the inoperable channel has not been returned to an operable status, a special report to the Commission must be prepared and submitted within the subsequent 14 days, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.

If one or both parameters are not available (i.e., safety valve discharge temperature and primary containment pressure indication) with one or more safety valve position indications from the acoustic monitor unavailable, continued reactor operation is permissible during the next seven days. In this condition, if both secondary parameters are not restored to an operable status within seven days, the reactor shall be placed in a hot shutdown condition within the following 12 hours.

Note 6 - Within 30 days following the loss of one indication, or seven days following the loss of both indications, restore the inoperable channel(s) to an operable status or a special report to the Commission must be prepared and submitted within the subsequent 14 days, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.

TABLE 3.2.6 ACTION NOTE 2 A.1

Note 7 - ~~From and after the date that this parameter is unavailable by Control Room indication, within 72 hours ensure that local sampling capability is available. If the Control Room indication is not restored within 7 days, prepare and submit a special report to the NRC within 14 days following the event, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.~~ R.1

Note 8 - When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions for Operation and required action notes may be delayed for up to 6 hours.

A.4

A.1

VYNPS

A.1

Tests and Frequencies

TABLE 4.2.6

~~CALIBRATION REQUIREMENTS~~

MONITORING A.1

~~POST-ACCIDENT INSTRUMENTATION~~

A.1 Function

A.1 A.1 A.1

	A.1 Function ~~Parameter~~	Calibration	~~Instrument~~ Check
1.	Drywell Atmosphere Temperature	Every 6 Months	Once Each Day
2.	~~Containment~~ Drywell Pressure A.8	Once/Operating Cycle	Once Each Day
3.	Torus Pressure	Once/Operating Cycle	Once Each Day
4.	Torus Water Level	Once/Operating Cycle	Once Each Day
5.	Torus Water Temperature	Every 6 Months	Once Each Day
6.	Reactor Pressure	Once/Operating Cycle	Once Each Day
7.	Reactor Vessel Water Level	Once/Operating Cycle	Once Each Day
8.	Torus Air Temperature	Every 6 Months	Once Each Day
	~~Safety/Relief Valve Position~~	~~Every Refueling Outage (Note 9) (a Functional Test to be performed quarterly)~~	~~Once Each Day~~
	~~Safety Valve Position~~	~~Every Refueling Outage (Note 9) (a Functional Test to be performed quarterly)~~	~~Once Each Day~~

R.1

A.1

TABLE 4.2.6

~~CALIBRATION REQUIREMENTS~~ TESTS AND FREQUENCIES A.1

POST-ACCIDENT MONITORING INSTRUMENTATION A.1
(Cont'd)

Function A.1 ~~Parameter~~	Calibration A.1	~~Instrument~~ Check A.1 A.1
9. A.1 Containment High-Range Radiation Monitor	Once/Operating Cycle	Once each day
~~Stack Noble Gas Effluent~~	~~Every Operating Cycle (a Functional Test to be performed quarterly)~~	~~Once each day~~ R.1

A.1

ACTION

TABLE 4.2 NOTES

1. ~~Not used.~~ A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart.

3. Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

A.6

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

8. Functional tests and calibrations are not required when systems are not required to be operable. A.6

9. ~~The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.~~ R.1

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.6

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Tab 3.J

DW to Torus ΔP Instrumentation (Deleted)

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

2. If the required action and associated completion time of Specification 3.2.F.1 is not met, within the following 12 hours:

   a. Isolate the mechanical vacuum pump; or

   b. Isolate the main steam lines; or

   c. Place the reactor in the SHUTDOWN Mode.

G. Post-Accident Instrumentation

During reactor power operation, the instrumentation that displays information in the Control Room necessary for the operator to initiate and control the systems used during and following a postulated accident or abnormal operating condition shall be operable in accordance with Table 3.2.6.

~~H. Drywell to Torus ΔP Instrumentation~~

~~1. During reactor power operation, the Drywell to Torus ΔP Instrumentation (recorder #1-156-3 and instrument DPI-1-158-6) shall be operable except as specified in 3.2.H.2.~~

~~2. From and after the date that one of the Drywell to Torus ΔP instruments is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding thirty days unless the instrument is~~

4.2 SURVEILLANCE REQUIREMENTS

3. Perform an instrument calibration, except for the radiation detectors, using a current source once every three (3) months. The trip setting shall be ≤ 3.0 times background at rated thermal power.

4. Perform an instrument calibration using a radiation source once each refueling outage.

5. Perform a logic system functional test, including mechanical vacuum pump isolation valve, once each operating cycle.

G. Post-Accident Instrumentation

The post-accident instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.6.

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~~H. Drywell to Torus ΔP Instrumentation~~

~~The Drywell to Torus ΔP Instrumentation shall be calibrated once every six months and an instrument check will be made once per shift.~~

R.1

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

~~sooner made operable. If both instruments are made or found to be inoperable, and indication cannot be restored within a six hour period, an orderly shutdown shall be initiated and the reactor shall be in a hot shutdown condition in six hours and a cold shutdown condition in the following eighteen hours.~~

R.1

I. **Recirculation Pump Trip Instrumentation**

During reactor power operation, the Recirculation Pump Trip Instrumentation shall be operable in accordance with Table 3.2.1.

J. Deleted

K. **Degraded Grid Protective System**

During reactor power operation, the emergency bus undervoltage instrumentation shall be operable in accordance with Table 3.2.8.

L. **Reactor Core Isolation Cooling System Actuation**

When the Reactor Core Isolation Cooling System is required in accordance with Specification 3.5.G, the instrumentation which initiates actuation of this system shall be operable in accordance with Table 3.2.9.

4.2 SURVEILLANCE REQUIREMENTS

I. **Recirculation Pump Trip Instrumentation**

The Recirculation Pump Trip Instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.1.

J. Deleted

K. **Degraded Grid Protective System**

The emergency bus undervoltage instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.8.

L. **Reactor Core Isolation Cooling System Actuation**

Instrumentation and Logic Systems shall be functionally tested and calibrated as indicated in Table 4.2.9.

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Tab 3.K

Recirculation Pump Trip Instrumentation

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

sooner made operable. If both instruments are made or found to be inoperable, and indication cannot be restored within a six hour period, an orderly shutdown shall be initiated and the reactor shall be in a hot shutdown condition in six hours and a cold shutdown condition in the following eighteen hours.

A.2

I. Recirculation Pump Trip Instrumentation

A.3

~~During reactor power operation, the~~ Recirculation Pump Trip Instrumentation shall be operable

FOR EACH TRIP FUNCTION IN TABLE 3.2.7

in accordance with Table 3.2.~~1~~ 7

A.1

J. Deleted

K. Degraded Grid Protective System

During reactor power operation, the emergency bus undervoltage instrumentation shall be operable in accordance with Table 3.2.8.

L. Reactor Core Isolation Cooling System Actuation

When the Reactor Core Isolation Cooling System is required in accordance with Specification 3.5.G, the instrumentation which initiates actuation of this system shall be operable in accordance with Table 3.2.9.

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4.2 SURVEILLANCE REQUIREMENTS

M.4

2. Perform a Logic System Functional Test, including recirculation pump trip breaker actuation, of recirculation pump trip instrumentation Trip Functions once every Operating Cycle.

I. Recirculation Pump Trip Instrumentation

A.1

A.4

1. The Recirculation Pump Trip Instrumentation shall be CHECKED, functionally tested and calibrated in accordance with Table 4.2.~~1~~ 3

J. Deleted

K. Degraded Grid Protective System

The emergency bus undervoltage instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.8.

L. Reactor Core Isolation Cooling System Actuation

Instrumentation and Logic Systems shall be functionally tested and calibrated as indicated in Table 4.2.9.

WHEN A CHANNEL IS PLACED IN AN INOPERABLE STATUS SOLELY FOR PERFORMANCE OF REQUIRED 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 RECIRCULATION PUMP TRIP CAPABILITY.

A.5

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS A.1

A.1

A.3 RUN RUN RUN

VYNPS

TABLE 3.2.~~1~~ 7 A.1

~~(Cont'd)~~

A.1

REQUIRED A.1

RECIRCULATION PUMP TRIP ~~ACTUATION~~ INSTRUMENTATION

A.1 Actions when Required Channels are Inoperable

LA.2

Recirculation Pump Trip ~~- A & B (Note 1)~~

A.1	Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip ~~Level~~ Setting	Required ACTION When Minimum Conditions For Operation Are Not Satisfied
1.	2 ~~(Note 8)~~ A.5	Low-Low Reactor Vessel Water Level ~~(LM-2-3-68(A-D))~~	≥ 82.5" ~~> 6' 10.5" above top of enriched fuel~~ LA.3	Note ~~1~~ 1 A.1
3.	2 ~~(Note 8)~~	High Reactor Pressure ~~(PM-2-3-54(A-D))~~ LA.1	≤ 1150 psig	Note ~~1~~ 1
2.	2 ~~(Note 8)~~	Time Delay~~s (2-3-68(A-D)(X))~~	≤ 10 seconds	Note ~~1~~ 1
	~~1~~	~~Trip Systems Logic~~		~~Note 2~~ L.1

LA.3

A.1

7 ACTION A.1

TABLE 3.2.~~7~~ NOTES

1. Each of the two Core Spray, LPCI and RPT, subsystems are initiated and controlled by a trip system. The subsystem "B" is identical to the subsystem "A". LA.2

2. If the minimum number of operable instrument channels are not available, the inoperable channel shall be tripped using test jacks or other permanently installed circuits. If the channel cannot be tripped by the means stated above, that channel shall be made operable within 24 hours or an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours. LA.4 L.1

3. One trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic.

4. One trip system with initiating instrumentation arranged in a one-out-of-two logic.

5. If the minimum number of operable channels are not available, the system is considered inoperable and the requirements of Specification 3.5 apply. A.6

6. Any one of the two trip systems will initiate ADS. If the minimum number of operable channels in one trip system is not available, the requirements of Specification 3.5.F.2 and 3.5.F.3 shall apply. If the minimum number of operable channels is not available in both trip systems, Specifications 3.5.F.3 shall apply.

7. One trip system arranged in a two-out-of-two logic.

8. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions For Operation and required ACTIONS may be delayed for up to 6 hours ~~provided the associated Trip Function or redundant Trip Function maintains ECCS initiation capability or Recirculation Pump Trip capability.~~ A.5 A.6

9. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions For Operation and required ACTIONS may be delayed for up to 6 hours.

10. With one or more channels inoperable for Core Spray and/or LPCI:

    A. Within one hour from discovery of loss of initiation capability for feature(s) in one division, declare the associated systems inoperable, and
    B. Within 24 hours, place channel in trip.
    C. If required actions and associated completion times of actions A or B are not met, immediately declare the associated systems inoperable.

11. With one or more channels inoperable for injection permissive and/or recirculation discharge valve permissive:

    A. Within one hour from discovery of loss of initiation capability for feature(s) in one division, declare the associated systems inoperable, and
    B. Within 24 hours, restore channel to operable status.
    C. If required actions and associated completion times of actions A or B are not met, immediately declare the associated systems inoperable.

 A.1 {Move to separate pages}

See Section 3.2A/4.2A

A.1

7 ACTION

See Section 3.2.A/4.2A

TABLE 3.2.7 NOTES (Cont'd) (MOVE TO SEPARATE PAGE) A.1

18. With one or more channels inoperable for ADS:

A. Within one hour from discovery of loss of ADS initiation capability in one trip system, declare ADS inoperable, and
B. Within 96 hours from discovery of an inoperable channel concurrent with HPCI or RCIC System inoperable, restore channel to operable status, and
C. Within 8 days, restore channel to operable status.
D. If required actions and associated completion times of actions A, B or C are not met, immediately declare ADS inoperable.

TABLE 3.2.7 ACTION NOTE 1 — 19. With one or more channels inoperable for Recirculation Pump Trip: M.1

TABLE 3.2.7 ACTION NOTE 1.c — A. Within one hour from discovery of loss of Recirculation Pump Trip capability restore ~~one~~ all but one Trip Function or remove the associated recirculation pump from service in 6 hours or be in Startup/Hot Standby in 6 hours.

TABLE 3.2.7 ACTION NOTE 3

TABLE 3.2.7 ACTION NOTE 1.a — B. Within 14 days from discovery of an inoperable channel, restore channel to operable status or place in trip, and

TABLE 3.2.7 ACTION NOTE 1.b — C. Within 72 hours from discovery of ~~one trip function capability~~ not maintained, restore trip function ~~to operable status~~ and,

TABLE 3.2.7 ACTION NOTES 1 + 3 — D. If required actions and associated completion times of actions A, B or C are not met, immediately remove the associated recirculation pump from service in 6 hours or be in Startup/Hot Standby in 6 hours.

A.1

(not applicable for Trip Function 2 channels and not applicable if the inoperable channel is the result of an inoperable recirculation pump trip breaker) M.2

Trip Functions 1 and 2 with recirculation pump trip capability not maintained or with Trip Function 3 with recirculation pump trip capability M.1

TABLE 3.2.7

(Table 3.2.7 was intentionally deleted from the Technical Specifications)

replace with proposed Table 3.2.7 A.1

A.1

TABLE 4.2.6 7 A.1
(Cont'd) A.1

A.1 ~~MINIMUM~~ TESTS AND ~~CALIBRATION~~ FREQUENCIES

~~EMERGENCY CORE COOLING ACTUATION~~ INSTRUMENTATION

A.1 Recirculation Pump Trip Actuation System A.1

Trip Function	Functional Test (8) A.8	Calibration (8) A.8	Instrument Check A.1
A.1 1. Low-Low Reactor Vessel Water Level	Every Three Months ~~(Note 4)~~ A.9	Once/Operating Cycle Every 3 Months, (a) M.3	Once Each Day A.1
3 High Reactor Pressure	Every Three Months ~~(Note 4)~~	Once/Operating Cycle	Once Each Day
SEE SR4.2.2.2 ~~Trip System Logic~~	~~Once/Operating Cycle~~ A.11	~~Once/Operating Cycle~~	M.11 (2) A.7 M.5
A.1 2. Time Delay	NA A.1	Every 3 Months M.5	NA A.1

(a) Trip unit calibration only M.3

including recirculation trip breaker actuation M.4

A.1

VYNPS

TABLE 4.2.7

(Table 4.2.7 was intentionally deleted from the Technical Specifications)

{replace with proposeD Table 4.2.7} A.1

A.1

TABLE 4.2 NOTES

~~1. Not used.~~ A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart. A.10

3. Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system. A.7

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.9

~~5. Deleted.~~

~~6. Deleted.~~ A.1

~~7. Deleted.~~

8. Functional tests and calibrations are not required when systems are not required to be operable. A.8

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.10

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Tab 3.L

Degraded Grid Protective System

A.1

3.2 LIMITING CONDITIONS FOR OPERATION	4.2 SURVEILLANCE REQUIREMENTS
sooner made operable. If both instruments are made or found to be inoperable, and indication cannot be restored within a six hour period, an orderly shutdown shall be initiated and the reactor shall be in a hot shutdown condition in six hours and a cold shutdown condition in the following eighteen hours. A.2	
	MOVE TO SEPARATE PAGE A.1
I. Recirculation Pump Trip Instrumentation During reactor power operation, the Recirculation Pump Trip Instrumentation shall be operable in accordance with Table 3.2.1.	I. Recirculation Pump Trip Instrumentation The Recirculation Pump Trip Instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.1.
J. Deleted	J. Deleted
K. Degraded Grid Protective System A.3 M.1 During reactor power operation, ~~the~~ emergency bus undervoltage instrumentation FOR EACH TRIP FUNCTION IN TABLE 3.2.8 A.1 shall be operable in accordance with Table 3.2.8.	K. Degraded Grid Protective System The emergency bus undervoltage instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.8.
L. Reactor Core Isolation Cooling System Actuation When the Reactor Core Isolation Cooling System is required in accordance with Specification 3.5.G, the instrumentation which initiates actuation of this system shall be operable in accordance with Table 3.2.9.	L. Reactor Core Isolation Cooling System Actuation Instrumentation and Logic Systems shall be functionally tested and calibrated as indicated in Table 4.2.9.
	MOVE TO SEPARATE PAGE A.1

APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS M.1

A.1 REQUIRED CHANNELS PER BUS

A.1 Degraded Grid Protective System

TABLE 3.2.8

A.1 ~~EMERGENCY BUS UNDERVOLTAGE~~ INSTRUMENTATION

A.1 ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE

A.1 TRIP FUNCTION A.1

	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	~~Minimum Number of Operable Instruments~~ REQUIRED CHANNELS PER BUS	~~Parameter~~ TRIP FUNCTION	Trip Setting	~~Required Action~~
1.a	(a)	2 ~~per bus~~	Degraded Bus Voltage - Voltage ~~(27/3Z, 27/3W, 27/4Z, 27/4W)~~	~~3,700 volts ± 40 volts~~ ≥ 3660 volts and ≤ 3740 volts	Note 1
1.b	(a)	~~2 per bus~~ 1	Degraded Bus Voltage - Time Delay ~~(62/3W, 62/3Z, 62/4W, 62/4Z)~~	~~10 seconds ± 1 second~~ ≥ 9 seconds and ≤ 11 seconds	Note 2
1.c	(a)	2	Degraded Bus Voltage - Voltage Alarm	≥ 3660 volts and ≤ 3740 volts	Note 3
1.d	(a)	1	Degraded Bus Voltage - Alarm Time Delay	≥ 9 seconds and ≤ 11 seconds	Note 3

A.1 A.1 M.1 L.3 LA.1 LA.1 A.1 A.1

TABLE 3.2.8 NOTES ACTION A.1

1. If the minimum number of operable instrument channels are not available, the inoperable channel shall be tripped ~~using test jacks or other permanently installed circuits~~ within one hour. LA.2

2. If the minimum number of operable instrument channels are not available, ~~reactor power operation is permissible for only 7 successive days unless the system is sooner made operable.~~ restore the inoperable channel to operable status within 1 hour. L.1

If the Action and associated completion time are not met, immediately declare the associated diesel generator inoperable. L.1 L.2

A.1 MOVE TO SEPARATE PAGE

<INSERT A> L.3 M.1

(a) When the associated diesel generator is required to be operable M.1

A.1

Insert A

3. With one or more required Degraded Bus Voltage - Voltage Alarm Trip Function channels inoperable, take all of the applicable Actions in Notes 3.a and 3.b:

   a. With one or more buses with alarm capability not maintained, restore alarm capability within 1 hour; and

   b. Restore the inoperable channel(s) to operable status within 24 hours.

   If the Action and associated completion time of Note 3.a or 3.b are not met, initiate increased voltage monitoring of the associated 4.16 kV emergency bus(es).

L.3

A.1

A.1

DEGRADED GRID PROTECTIVE SYSTEM

TABLE 4.2.8

~~EMERGENCY BUS UNDERVOLTAGE~~ INSTRUMENTATION

A.1

TESTS AND FREQUENCIES

Trip ~~System~~ Function A.1	Functional Test	Calibration ~~(8)~~ A.4
A.1 1.a and 1.b Degraded Bus Voltage	See Note ~~10~~ a A.1	Once/Operating Cycle

(a) Separate Functional Tests are not required for this Trip Function. Trip Function operability is demonstrated during Trip Function Calibration and integrated ECCS tests performed once per Operating Cycle. A.1

A.1

TABLE 4.2 NOTES

1. ~~Not used.~~ A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart.

3. Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

A.5

5. ~~Deleted.~~

6. ~~Deleted.~~

7. ~~Deleted.~~

A.1

8. Functional tests and calibrations are not required when systems are not required to be operable. A.4

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle. A.5

A.1 FOOTNOTE a

~~10.~~ Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power).

A.5

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Tab 3.M

RCIC System Actuation

A.1

3.2 LIMITING CONDITIONS FOR OPERATION

sooner made operable. If both instruments are made or found to be inoperable, and indication cannot be restored within a six hour period, an orderly shutdown shall be initiated and the reactor shall be in a hot shutdown condition in six hours and a cold shutdown condition in the following eighteen hours.

A.2

I. Recirculation Pump Trip Instrumentation

During reactor power operation, the Recirculation Pump Trip Instrumentation shall be operable in accordance with Table 3.2.1.

J. Deleted

K. Degraded Grid Protective System

During reactor power operation, the emergency bus undervoltage instrumentation shall be operable in accordance with Table 3.2.8.

A.1

(RCIC)

L. Reactor Core Isolation Cooling System Actuation

A.3

When the Reactor Core Isolation Cooling System is required in accordance with Specification 3.5.G, the instrumentation which initiates actuation of this system shall be operable in accordance with Table 3.2.9.

A.1

RCIC SYSTEM

FOR EACH TRIP FUNCTION IN TABLE 3.2.9

A.1

A.4

2. Perform a Logic System Functional Test of RCIC System Instrumentation Trip Functions once every Operating Cycle.

4.2 SURVEILLANCE REQUIREMENTS

MOVE TO SEPARATE PAGE A.1

I. Recirculation Pump Trip Instrumentation

The Recirculation Pump Trip Instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.1.

J. Deleted

K. Degraded Grid Protective System

The emergency bus undervoltage instrumentation shall be functionally tested and calibrated in accordance with Table 4.2.8.

L. Reactor Core Isolation Cooling System Actuation

RCIC SYSTEM

A.1

1. ~~Instrumentation and Logic Systems~~ Shall be CHECKED, functionally tested and calibrated as indicated in Table 4.2.9.

A.4

A.5

WHEN A CHANNEL IS PLACED IN AN INOPERABLE STATUS SOLELY FOR PERFORMANCE OF REQUIRED SURVEILLANCES, ENTRY INTO ASSOCIATED LIMITING CONDITIONS FOR OPERATION AND REQUIRED ACTIONS MAY BE DELAYED AS FOLLOWS:
(a) FOR UP TO 6 HOURS FOR TRIP FUNCTION 3; AND (b) FOR UP TO 6 HOURS FOR TRIP FUNCTIONS 1 AND 2 PROVIDED THE ASSOCIATED TRIP FUNCTION MAINTAINS RCIC INITIATION CAPABILITY.

A.6

A.1

TABLE 3.2.9

REACTOR CORE ISOLATION COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

REQUIRED

	Minimum Number of Operable Instrument Channels per ~~Trip System~~ Function	Trip Function	Trip ~~Level~~ Setting	~~Required~~ ACTIONS When ~~Minimum Conditions For Operation Are Not Satisfied~~ REQUIRED CHANNELS ARE INOPERABLE	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS
1	4 ~~2 (Notes 1, 5)~~	Low-Low Reactor Vessel Water Level ~~(LT-2-3-72(A-D)(M))~~	≥82.5" ~~Above Top of Enriched Fuel~~	Note ~~6~~ 1	RUN, STARTUP/HOT STANDBY (a), HOT SHUTDOWN (a), REFUEL (a)
2	2 ~~(Notes 2, 5)~~	Low Condensate Storage Tank Water Level ~~(LT-107-12A/B(M))~~	≥~~3~~ 3.81% (b)	Note ~~8~~ 2	RUN, STARTUP/HOT STANDBY (a), HOT SHUTDOWN (a), REFUEL (a)
3	2 ~~(Notes 3, 6)~~	High Reactor Vessel Water Level ~~(LT-2-3-72C/D(82))~~	≤177" ~~Above Top of Enriched Fuel~~	Note ~~9~~ 3	RUN, STARTUP/HOT STANDBY (a), HOT SHUTDOWN (a), REFUEL (a)
	~~1~~	~~Trip System Logic~~	~~--~~	~~Note 4~~	

(b) PERCENT OF INSTRUMENT SPAN.

A.1 M.3 LA.1 LA.2 LA.3 M.2 A.6 L.1 A.3

A.1

TABLE 3.2.9 Action NOTES

LA.2

1. One trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic.

2. One trip system with initiating instrumentation arranged in a one-out-of-two logic.

3. One trip system arranged in a two-out-of-two logic.

L.1

4. If the minimum number of operable channels are not available, the system is considered inoperable and the requirements of Specification 3.5 apply.

A.6

5. When a channel is placed in an inoperable status solely for performance of required 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 RCIC initiation capability.

6. When a channel is placed in an inoperable status solely for performance of required surveillances, entry into associated Limiting Conditions For Operation and required ACTIONS may be delayed for up to 6 hours.

Table 3.2.9 Action Note 1

7. With one or more channels inoperable for RCIC:

a. Within one hour from discovery of loss of system initiation capability, declare the RCIC system inoperable, and
b. Within 24 hours, place channel in trip.
c. If required actions and associated completion times of actions A or B are not met, immediately declare the RCIC system inoperable.

Table 3.2.9 Action Note 2

8. With one or more channels inoperable for RCIC:

a. Within one hour from discovery of loss of system initiation capability while suction is aligned to the CST, declare the RCIC system inoperable, and
b. Within 24 hours, place channel in trip or align suction for the RCIC system to the suppression pool.
c. If required actions and associated completion times of actions A or B are not met, immediately declare the RCIC system inoperable.

Table 3.2.9 Action Note 3

9. With one or more channels inoperable for RCIC:

A. Within 24 hours, restore channel to operable status.
B. If required action and associated completion time of action A is not met, immediately declare the RCIC system inoperable.

A.1

A.1 A.1 A.1

TABLE 4.2.9

MINIMUM TEST AND CALIBRATION FREQUENCIES

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

A.1 A.1 A.1

	Trip Function	Functional Test (a) A.7	Calibration (a) A.7	~~Instrument~~ Check
1.	Low-Low Reactor Vessel Water Level	Every Three Months	~~Once/Operating Cycle~~ Every 3 Months, (a) M.1	Once each day
2.	Low Condensate Storage Tank Water Level	Every Three Months	~~Once/Operating Cycle~~	H NA A.1
3.	High Reactor Vessel Water Level	Every Three Months	~~Once/Operating Cycle~~	H NA A.1
SEE SR 4.2.1.2	~~Trip System Logic~~	~~Once/Operating Cycle~~ A.10	~~Once/Operating Cycle (Note 3)~~ A.8	H A.10

(a) Trip unit calibration only. M.1

A.1

TABLE 4.2 NOTES

1. ~~Not used~~ A.1

2. During each refueling outage, simulated automatic actuation which opens all pilot valves shall be performed such that each trip system logic can be verified independent of its redundant counterpart. A.9

3. ~~Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system.~~ A.8

4. This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel. A.9

5. ~~Deleted.~~

6. ~~Deleted.~~ A.1

7. ~~Deleted.~~

8. Functional tests and calibrations are not required when systems are not required to be operable. A.7

9. The thermocouples associated with safety/relief valves and safety valve position, that may be used for back-up position indication, shall be verified to be operable every operating cycle.

10. Separate functional tests are not required for this instrumentation. The calibration and integrated ECCS tests which are performed once per operating cycle will adequately demonstrate proper equipment operation.

11. Trip system logic functional tests will include verification of operation of all automatic initiation inhibit switches by monitoring relay contact movement. Verification that the manual inhibit switches prevent opening all relief valves will be accomplished in conjunction with Section 4.5.F.1.

12. Trip system logic testing is not applicable to this function. If the required surveillance frequency (every Refueling Outage) is not met, functional testing of the Reactor Mode Switch-Shutdown Position function shall be initiated within 1 hour after the reactor mode switch is placed in Shutdown for the purpose of commencing a scheduled Refueling Outage.

13. Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when >30% Rated Thermal Power). A.9

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Tab 3.N

Core and Containment Cooling Systems

3.5 LIMITING CONDITION FOR OPERATION

3. From and after the date that the Alternate Cooling Tower System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days, unless the Alternate Cooling Tower System is sooner made operable, provided that during such seven days, the Station Service Water System and both essential equipment cooling loops are operable.

4. If the requirements of Specification 3.5.D cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

E. High Pressure Cooling Injection (HPCI) System

1. Except as specified in Specification 3.5.E.2, whenever irradiated fuel is in the reactor vessel and reactor steam pressure is greater than 150 psig:

a. The HPCI System shall be operable.

b. The condensate storage tank shall contain at least 75,000 gallons of condensate water.

4.5 SURVEILLANCE REQUIREMENT

3. Deleted.

E. High Pressure Coolant Injection (HPCI) System

Surveillance of HPCI System shall be performed as follows:

1. Testing

Deleted

a. ~~A simulated automatic actuation test of the HPCI System shall be performed during each refueling outage.~~ 4.1

b. Operability testing of the pump and valves shall be in accordance with Specification 4.6.E.

c. Upon reactor startup, HPCI operability testing shall be performed as required by Specification 4.6.E within 24 hours after exceeding 150 psig reactor steam pressure.

3.5 LIMITING CONDITION FOR OPERATION

due to malfunction of the electrical portion of the valve when the reactor is pressurized above 150 psig with irradiated fuel in the reactor vessel, continued reactor operation is permissible only during the succeeding seven days unless such a valve is sooner made operable, provided that during such seven days both the remaining Automatic Relief System valves and the HPCI System are operable.

3. If the requirements of Specification 3.5.F cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to ≤ 150 psig within 24 hours.

G. Reactor Core Isolation Cooling System (RCIC)

1. Except as specified in Specification 3.5.G.2 below, the RCIC System shall be operable whenever the reactor steam pressure is greater than 150 psig and irradiated fuel is in the reactor vessel.

2. From and after the date that the RCIC System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 14 days unless such system is sooner made operable, provided that:

    a. The HPCI System is immediately verified by administrative means to be operable, and

4.5 SURVEILLANCE REQUIREMENT

G. Reactor Core Isolation Cooling System (RCIC)

Surveillance of the RCIC System shall be performed as follows:

1. Testing Deleted

    A.1

    a. ~~A simulated automatic actuation test of the RCIC System shall be performed during each refueling outage.~~

    b. Operability ~~testing of~~ the pump and valves shall be in accordance with Specification 4.6.E.

    c. Upon reactor startup, RCIC operability testing shall be performed as required by Specification 4.6.E within 24 hours after exceeding 150 psig reactor steam pressure.

BASES: 4.5 (Cont'd)

D., E., and F. Station Service Water and Alternate Cooling Tower Systems and High Pressure Coolant Injection and Automatic Depressurization System

HPCI system testing demonstrates operational readiness of equipment and detects degradations which may affect reliable operation. Testing is conducted during each reactor startup if maintenance that affects operability was performed on the HPCI system. Periodic testing is also performed in accordance with Specification 4.6.E and the inservice testing program.

Sufficient steam flow must be available prior to HPCI testing to avoid inducing an operational transient when steam is diverted to the HPCI system. Reactor startup is allowed prior to performing the required surveillance testing in order to achieve adequate steam pressure and flow. However, a 24-hour limitation is imposed for performing operability testing once reactor steam pressure exceeds 150 psig. The short duration before full functional testing is performed is considered acceptable.

The Automatic Depressurization System is tested during refueling outages to avoid an undesirable blowdown of the Reactor Coolant System. A.1

~~The HPCI Automatic Actuation Test will be performed by simulation of the accident signal. The test is normally performed in conjunction with the automatic actuation of all Core Standby Cooling Systems.~~

G. Reactor Core Isolation Cooling System

The frequency and conditions for testing of the RCIC system are the same as for the HPCI system. Testing is conducted in accordance with Specification 4.6.E and provides assurance that the system will function as intended.

H. Minimum Core and Containment Cooling System Availability

Deleted.

I. Maintenance of Filled Discharge Pipe

Observation of water flowing from the discharge line high point vent as required by Specification 4.5.I assures that the Core Cooling Subsystems will not experience water hammer damage when any of the pumps are started. Core Spray Subsystems and LPCI Subsystems will also be vented through the discharge line high point vent following a return from an inoperable status to assure that the system is "solid" and ready for operation.

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Tab 3.O

Bases for Fuel Cladding Safety Limits

BASES: 1.1 (Cont'd)

With no reactor coolant recirculation loops in operation, the plant must be brought to a condition in which the LCO does not apply. Operation of at least one reactor coolant recirculation loop provides core flow greater than natural circulation, so the margin to a critical power condition is significantly greater than this bounding example for all normal operating conditions with power less than the low power thermal limit. Therefore, a low power thermal limit of 23% rated thermal power is conservative.

Additionally, a core thermal power limit of 23% rated thermal power ensures consistency with the threshold for requiring thermal limit monitoring (i.e., average planar linear heat generation rate, linear heat generation rate, and minimum critical power ratio). This assures that for those power levels where thermal limit monitoring is required, the General Electric critical power correlation is applicable.

C. Power Transient A.22

Plant safety analyses have shown that the scrams caused by exceeding any safety setting will assure that the Safety Limit of Specification 2.1.1A or 2.1.1B will not be exceeded. Scram times are checked periodically to assure the insertion times are adequate. The thermal power transient resulting when a scram is accomplished other than by the expected scram signal (e.g., scram from neutron flux following closure of the main turbine stop valves) does not necessarily cause fuel damage. However, for this specification a Safety Limit violation will be assumed when a scram is only accomplished by means of a backup feature of the plant design. The concept of not approaching a Safety Limit provided scram signals are operable is supported by the extensive plant safety analysis.

The computer provided with Vermont Yankee has a sequence annunciation program which will indicate the sequence in which events such as scram, APRM trip initiation, pressure scram initiation, etc. occur. This program also indicates when the scram setpoint is cleared. This will provide information on how long a scram condition exists and thus provide some measure of the energy added during a transient.

D. Reactor Water Level (Shutdown Condition)

During periods when the reactor is shutdown, consideration must also be given to water level requirements due to the effect of decay heat. If reactor water level should drop below the top of the enriched fuel during this time, the ability to cool the core is reduced. This reduction in core cooling capability could lead to elevated cladding temperatures and clad perforation. The core can be cooled sufficiently should the water level be reduced to two-thirds the core height. Establishment of the safety limit at 12 inches above the top of the enriched fuel provides adequate margin. This level will be continuously monitored.

A.1

A.1

the Bases for Specifications 3.1.A, 3.2.A and 3.2.B.

A.1

of Section 2.1

BASES:

2.1 FUEL CLADDING INTEGRITY

A. Trip Settings

The bases for individual trip settings are discussed in the following paragraphs.

1. Neutron Flux Trip Settings

a. APRM Flux Scram Allowable Value (Run Mode)

The average power range monitoring (APRM) system, which is calibrated using heat balance data taken during steady state conditions, reads in percent of rated thermal power (1912 MWt). Because fission chambers provide the basic input signals, the APRM system responds directly to average neutron flux. During transients, the instantaneous rate of heat transfer from the fuel (reactor thermal power) is less than the instantaneous neutron flux due to the time constant of the fuel. Therefore, during abnormal operational transients, the thermal power of the fuel will be less than that indicated by the neutron flux at the scram setting. Analyses are performed to demonstrate that the APRM flux scram over the range of settings from a maximum of 120% to the minimum flow biased setting provide protection from the fuel safety limit for all abnormal operational transients including those that may result in a thermal hydraulic instability.

A.1

An increase in the APRM scram trip setting would decrease the margin present before the fuel cladding integrity Safety Limit is reached. The APRM scram trip setting was determined by an analysis of margins required to provide a reasonable range for maneuvering during operation. Reducing this operating margin would increase the frequency of spurious scrams which have an adverse effect on reactor safety because of the resulting thermal stresses. Thus, the APRM scram trip setting was selected because it provides adequate margin for the fuel cladding integrity Safety Limit yet allows operating margin that reduces the possibility of unnecessary scrams. The relationship between recirculation drive flow and reactor core flow is non-linear at low core flows. Due to stability concerns, separate APRM flow biased scram trip setting equations are provided for low core flows.

The APRM flow biased flux scram Allowable Value is the limiting value that the trip setpoint may have when tested periodically, beyond which appropriate action shall be taken. For Vermont Yankee, the periodic testing is defined as the calibration. The actual scram trip is conservatively set in relation to the Allowable Value to ensure operability between periodic testing. For single recirculation loop operation, the APRM flux scram 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 single loop

A.1

BASES: 2.1 (Cont'd)

operation equations are based on a bounding (maximum) difference between two loop and single loop drive flow at the same core flow of 8%.

Analyses of the limiting transients show that no scram adjustment is required to assure fuel cladding integrity when the transient is initiated from the operating limit MCPR defined in the Core Operating Limits Report.

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Flux Scram Trip Setting (Refuel or Startup and Hot Standby Mode)

For operation in the startup mode while the reactor is at low pressure, the reduced APRM scram setting to 15% of rated power provides adequate thermal margin between the setpoint and the safety limit, 23% of the rated. (During an outage when it is necessary to check refuel interlocks, the mode switch must be moved to the startup position. Since the APRM reduced scram may be inoperable at that time due to the disconnection of the LPRMs, it is required that the IRM scram and the SRM scram in noncoincidence be in effect. This will ensure that adequate thermal margin is maintained between the setpoint and the safety limit.) The margin is adequate to accommodate anticipated maneuvers associated with station startup. Effects of increasing pressure at zero or low void content are minor, cold water from sources available during startup is not much colder than that already in the system, temperature coefficients are small, and control rod patterns are constrained to be uniform by operating procedures backed up by the rod worth minimizer. Worth of individual rods is very low in a uniform rod pattern. Thus, of all possible sources of reactivity input, uniform control rod withdrawal is the most probable cause of significant power rise. Because the flux distribution associated with uniform rod withdrawals does not involve high local peaks, and because several rods must be moved to change power by a significant percentage of rated power, the rate of power rise is very slow. Generally, the heat flux is in near equilibrium with the fission rate. In an assumed uniform rod withdrawal approach to the scram level, the rate of power rise is no more than 5% of rated power per minute, and the APRM system would be more than adequate to assure a scram before the power could exceed the safety limit. The reduced APRM scram remains active until the mode switch is placed in the RUN position. This switch can occur when reactor pressure is greater than 800 psia.

The IRM system consists of 6 chambers, 3 in each of the reactor protection system logic channels. The IRM is a 5-decade instrument, which covers the range of power level between that covered by the SRM and the APRM. The 5 decades are covered by the IRM by means of a range switch and the 5 decades are broken down into 10 ranges, each being one-half of a decade in size. The IRM scram trip setting of 120/125 of full scale is active in each range of the IRM. For example, if the instrument were on range 1, the scram setting would be a 120/125 of full scale for that range; likewise, if the instrument were on range 5, the scram would be 120/125 of full scale on that range. Thus, as the IRM is ranged up to accommodate the increase in power level, the scram trip setting is also ranged up. The most significant sources of reactivity change during the power increase are due to control rod withdrawal. For in-sequence control rod withdrawal, the rate of change of power is slow enough due to the physical limitation of withdrawing control rods, that heat flux is in equilibrium with the neutron flux and an IRM scram would result in a reactor shutdown well before any safety limit is exceeded.

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BASES: 2.1 (Cont'd)

In order to ensure that the IRM provided adequate protection against the single rod withdrawal error, a range of rod withdrawal accidents was analyzed. This analysis included starting the accident at various power levels. The most severe case involves an initial condition in which the reactor is just subcritical and the IRM system is not yet on scale. This condition exists at quarter rod density. Additional conservatism was taken in this analysis by assuming that the IRM channel closest to the withdrawn rod is bypassed. The results of this analysis show that the reactor is scrammed and peak power limited to one percent of rated power, thus maintaining MCPR above the fuel cladding integrity safety limit. Based on the above analysis, the IRM provides protection against local control rod withdrawal errors and continuous withdrawal of control rods in sequence.

B. Deleted

C. Reactor Low Water Level Scram

The reactor low water level scram is set at a point which will prevent reactor operation with the steam separators uncovered, thus limiting carry-under to the recirculation loops. In addition, the safety limit is based on a water level below the scram point and therefore this setting is provided.

D. Reactor Low Water Level ECCS Initiation Trip Point

The core standby cooling subsystems are designed to provide sufficient cooling to the core to dissipate the energy associated with the loss-of-coolant accident and to limit fuel clad temperature to well below the clad melting temperature, and to limit clad metal-water reaction to less than 1%, to assure that core geometry remains intact.

The design of the ECCS components to meet the above criteria was dependent on three previously set parameters: the maximum break size, the low water level scram setpoint, and the ECCS initiation setpoint. To lower the ECCS initiation setpoint would now prevent the ECCS components from meeting their design criteria. To raise the ECCS initiation setpoint would be in a safe direction, but it would reduce the margin established to prevent actuation of the ECCS during normal operation or during normally expected transients.

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BASES: 2.1 (Cont'd)

E. Turbine Stop Valve Closure Scram Trip Setting

The turbine stop valve closure scram trip anticipates the pressure, neutron flux and heat flux increase that could result from rapid closure of the turbine stop valves. With a scram trip setting of <10% of valve closure from full open, the resultant increase in surface heat flux is limited such that MCPR remains above the fuel cladding integrity safety limit even during the worst case transient that assumes the turbine bypass is closed. This scram signal may be bypassed at ≤ 25% of reactor Rated Thermal Power.

F. Turbine Control Valve Fast Closure Scram

The control valve fast closure scram is provided to limit the rapid increase in pressure and neutron flux resulting from fast closure of the turbine control valves due to a load rejection coincident with failure of the bypass system. This transient is less severe than the turbine stop valve closure with failure of the bypass valves and therefore adequate margin exists. This scram signal may be bypassed at ≤ 25% of reactor Rated Thermal Power.

G. Main Steam Line Isolation Valve Closure Scram

The isolation scram anticipates the pressure and flux transients which occur during an isolation event and the loss of inventory during a pipe break. This action minimizes the effect of this event on the fuel and pressure vessel.

H. Reactor Coolant Low Pressure Initiation of Main Steam Isolation Valve Closure

The low pressure isolation of the main steam lines at 800 psig is provided to give protection against rapid reactor depressurization and the resulting rapid cooldown of the vessel. Advantage is taken of the scram feature which occurs when the main steam line isolation valves are closed, to provide the reactor shutdown so that high power operation at low reactor pressure does not occur. Operation of the reactor at pressures lower than 800 psig requires that the reactor mode switch be in the startup position where protection of the fuel cladding integrity safety limit is provided by the IRM high neutron flux scram.

Thus, the combination of main steam line low pressure isolation and isolation valve closure scram assures the availability of neutron scram protection over the entire range of applicability of the fuel cladding integrity safety limit.

Vermont Yankee Nuclear Power Station

Proposed Change 273

Tab 4

Safety Assessment Discussion of Changes

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.A

Table of Contents, Definitions, Safety Limits And Reactor Protection System

SAFETY ASSESSMENT OF CHANGES
TS 1.0 – DEFINITIONS
TS 2.1 LIMITING SAFETY SYSTEM SETTINGS
TS 3.1/4.1 – REACTOR PROTECTION SYSTEM INSTRUMENTATION

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.1/4.1 and associated Technical Specifications, these changes are depicted in the marked-up CTS pages shown, and include:

- Table of Contents, page i – Various editorial changes, including relocation of headers, renumbering starting pages for sections, removing references to deleted sections, and clarifying section names.

- TS 2.1, page 8 – LSSS 2.1.A.1.b slightly rewritten for clarity.

- TS 2.1, page 10 – LSSS 2.1.D through 2.1.H rewritten for clarity and to replace "at least," "greater than," and "less than or equal to" text with appropriate mathematical symbols.

- TS 3.1/4.1, page 20 - Rewritten for clarity after incorporation of other changes, and to remove the word "Deleted" where previously eliminated 3.1.B and 4.1.B text was located.

- TS Table 3.1.1, page 21 – Title modified for accuracy, column headings changed to match ISTS style, trip function sub-items given specific sequential numbering, "NA" inserted for previously blank entries, columns repositioned for clarity and consistency and certain table contents moved to footnotes.

- Table 3.1.1, page – 22, - Title modified for accuracy, column headings changed to match ISTS style, "Deleted" wording removed where previously eliminated line items were located and remaining trip function line items renumbered accordingly, columns repositioned for clarity and consistency and certain table contents moved to footnotes.

- Table 3.1.1 Notes, page 23 – Header modified to read "ACTION Notes" and "water" changed to "coolant" in Note 1.

- Table 3.1.1 Notes, page 24 - Header changed to read "ACTION Notes," flag added for Footnote (d) and "Deleted" wording removed where previously eliminated line items were located.

- Table 4.1.1, page 25 – Title and column headings modified for accuracy, minor text edits made, trip function line items given specific sequential numbering, Calibration column inserted into table and Footnotes (a), (b) (c) and (e) relocated from Notes pages to reflect combination of CTS Calibration requirements with CTS Functional Test requirements in proposed Table 4.1.1.

[Footnote (d) was added by Discussion of Changes (DOC) L.10 below.]

- Table 4.1.1 Notes, page 26 – "Not Used" wording deleted from previous Note 1 entry and flag added for Footnote (b).

- Table 4.1.2, page 27 – Table renumbered as 4.1.1 to reflect combination of CTS Calibration requirements with CTS Functional Test requirements in proposed Table 4.1.1, title and column headings modified for accuracy, Trip Function line items and sub-items given specific sequential numbering to align with Table 4.1.1 Trip Functions, flags added for Footnotes (a), (b), (c) and (e) [Footnote (d) flag was added to the table by DOC L.10 below], and calibration "Frequency" column retitled "Calibration" and relocated to Table 4.1.2.

- Table 4.1.2 Notes, page 28 - Title changed to "Table 4.1.1" to reflect combination with page 26 content and elimination of Table 4.1.2, "Deleted" wording removed where previously eliminated Note 3 entry was located and flags added for Footnote (a), (b), (c) and (e) that are replacing Notes 7, 11, 10 and 9, respectively in new Table 4.1.1.

A.2 CTS 3.1.A provides Reactor Protection System (RPS) response time requirements (i.e., the system response time from the opening of the sensor contact to and including the opening of the scram solenoid relay...). This information is moved to proposed VYNPS TS definition 1.0.OO, "Reactor Protection System (RPS) Response Time." This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.3 CTS 3.1.A provides Reactor Protection System (RPS) response time acceptance criteria (i.e., system response time shall not exceed 50 milliseconds). CTS Table 4.1.2 Note 4 provides RPS response time test frequency requirements (i.e., response time will be checked every operating cycle). These requirements are located in proposed Surveillance Requirement (SR) 4.1.A.3 and presented as "Verify RPS Response Time is $\leq$ 50 milliseconds for each automatic RPS Trip Function once every Operating Cycle." This change does not involve a technical change, but is only a difference in presentation Therefore, this change is considered administrative.

A.4 Deleted.

A.5 CTS 4.1.A includes reference to CTS Tables 4.1.1 and 4.1.2 for functional test and calibration requirements for RPS. CTS 4.1.A is revised, in proposed SR 4.1.A.1 and Table 4.1.1, to also include reference to check requirements consistent with CTS Table 4.1.1, Note 2. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain RPS instrument trip functions. Therefore, this change is considered administrative in nature.

A.6 The Surveillance Requirements for RPS instrument trip functions in CTS Table 4.1.1, Table 4.1.2, and associated Notes are combined in proposed Table 4.1.1 as a human factors enhancement. This change is a difference in presentation only and does not alter the current requirements to periodically perform RPS instrument trip function Surveillances. Therefore, this change is considered administrative in nature.

A.7 CTS Table 4.1.1 includes a requirement to functionally test the RPS Scram Test Switches and CTS Table 4.1.1, Note 9, modifies this requirement by stating that the automatic scram contactors shall be exercised once every week by either using the RPS channel test switches or by performing a functional test of any automatic scram function and that a functional test of an automatic scram function satisfies the test using the RPS channel test switch. These requirements have been moved to proposed SR 4.1.A.2 and presented as, "Exercise each automatic scram contactor once every week using the RPS channel test switches or by performing a Functional Test of any automatic RPS Trip Function." This change is a difference in presentation only and does not alter the current requirements to periodically perform functional testing/exercising of the RPS automatic scram contactors. Therefore, this change is considered administrative in nature.

A.8 CTS Table 3.1.1, Note 2, last paragraph, provides an allowance to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances. This allowance is moved to proposed SR 4.1.A.1. This change does not involve a technical change, but is only a difference in presentation . Therefore, this change is considered administrative.

A.9 CTS Table 3.1.1 identifies the RPS Trip Functions that are required to be operable when the reactor mode switch is in Refuel and Note 1 to CTS Table 3.1.1 identifies a subset of these RPS Trip Functions that are required to be operable when the reactor mode switch is in Refuel and the reactor is subcritical and the reactor water temperature is less than 212°F. These requirements have been reflected with 1) an Applicability in proposed Table 3.1.1 of Refuel with reactor coolant temperature > 212°F for each of the RPS Trip Functions required to be operable with the reactor mode switch in Refuel in CTS Table 3.1.1 and 2) a separate explicit Applicability of Refuel with reactor coolant temperature $\leq$ 212°F for those RPS Trip Functions included in Note 1 to CTS Table 3.1.1. (The change to temperature requirement in CTS Table 3.1.1, from less than 212°F to less than or equal to 212°F, is addressed in DOC L.11 below). In addition, with the reactor mode switch in Refuel, no more than one control rod can be withdrawn and all the other the control rods are inserted in the reactor core. In this condition, the reactor will be subcritical. Therefore, it is not necessary to state the reactor is subcritical when the reactor mode switch is in Refuel and this wording "when the reactor is subcritical" is deleted. Commensurate changes are also made to CTS 2.1.A.1.b. Since the changes involve only a difference in presentation, the changes are considered administrative.

A.10 Note 2 to CTS Table 3.1.1 provides actions when the minimum number of channels per trip system requirement is not met. These requirements are identified in a separate column in proposed Table 3.1.1 titled, "ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE." This change is a difference in presentation only and does not alter the current action requirements when required RPS channels are inoperable. Therefore, this change is considered administrative in nature.

A.11 All Main Steam Line Isolation Valve Closure channels are required to be operable to assure a scram with the worst single failure. The Main Steam Line Isolation Valve Closure Trip Function (CTS Table 3.1.1, Trip Function 10 and proposed Table 3.1.1, Trip Function 9) requires a minimum of 4 channels per trip system. There is one position switch per valve (one switch with two contacts). In reality, each of the eight main steam line isolation valves inputs its closure signal to each RPS trip system (trip system A and B). To ensure the interpretation that all main steam line isolation valve position switches are required for each trip system, each main steam line isolation valve contact is viewed as a separate channel (a total of 16 channels). Therefore, the minimum number of channels per trip system required to be operable in proposed Table 3.1.1 is more appropriately specified as "8." Since this change involves no design change but is only a difference in nomenclature and presentation , this change is considered administrative.

A.12 The Turbine Control Valve Fast Closure RPS Trip Function and the Turbine Stop Valve Closure RPS Trip Function (CTS Table 3.1.1, Trip Functions 11 and 12) are required by CTS Table 3.1.1 to be operable in the Run Mode. CTS Table 3.1.1 Note 10 states that the signals for these Trip Functions may be bypassed when power is ≤ 25% of Rated Thermal Power. The intent of this note is to waive the operability requirements of the Turbine Control Valve Fast Closure RPS Trip Function and Turbine Stop Valve RPS Trip Function when reactor power is ≤ 25%. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.1.1 requires the Turbine Control Valve Fast Closure RPS Trip Function and the Turbine Stop Valve RPS Trip Function (proposed Table 3.1.1, Trip Functions 10 and 11) to be operable when reactor power is > 25% RATED THERMAL POWER which is equivalent to CTS requirements. As such, this change is considered administrative in nature.

A.13 All Turbine Stop Valve Closure channels are required to be operable to assure a scram with the worst single failure. The Turbine Stop Valve Closure Trip Function (CTS Table 3.1.1, Trip Function 12 and proposed Table 3.1.1, Trip Function 11) requires a minimum of 2 channels per trip system. There is one limit switch per valve (one switch with two contacts). In reality, each of the four turbine stop valves inputs its closure signal to each RPS trip system (trip system A and B). To ensure the interpretation that all turbine stop valve position switches are required for each trip system, each turbine stop valve limit switch contact is viewed as a separate channel (a total of 8 channels). Therefore, the minimum number of channels per trip system required to be operable in proposed Table 3.1.1 is more appropriately specified as "4." Since this change involves no design change but is only a difference in nomenclature and presentation, this change is considered administrative.

A.14 For CTS Table 3.1.1, Trip Functions 4, 11, and 12 (APRM High Flux [Flow Bias], Turbine Control Valve Fast Closure, and Turbine Stop Valve Closure), two optional shutdown alternatives are provided when minimum conditions for operation are not satisfied. One of these optional shutdown alternatives (CTS Table 3.1.1 Note 3.A) requires immediate insertion of operable rods and complete insertion of operable rods within 4 hours. This action essentially places the plant in a condition beyond that required to exit the applicable Mode or condition of the associated Trip Functions in less time than is necessary for the other optional requirements (CTS Table 3.1.1 Note 3.B for the APRM High Flux (Flow Bias) Trip Function and CTS Table 3.1.1 Note 3.D for the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions). As such, CTS Table 3.1.1 Note 3.A represents a more restrictive optional requirement for these Trip Functions. Given the choice of the shutdown actions to take, the optional action to exit the applicable Mode or condition with the longer time period would be selected to potentially avoid the shutdown transient and allow the plant to be shutdown in a more controlled manner. Therefore, the deletion of the optional shutdown action (CTS Table 3.1.1 Note 3.A) for CTS Table 3.1.1 Trip Functions 4, 11, and 12 (proposed Table 3.1.1 Trip Functions 4.a, 10 and 11) does not alter the current plant actions that would be taken when minimum conditions for operation are not satisfied. Since the deleted action is optional and would not be used, the change is considered administrative.

A.15 CTS Table 3.1.1 Note 3 states, in the first paragraph, "When the requirements in the column "Minimum Number of Operating Instrument Channels Per Trip System" can not be met for one system, that system shall be tripped. If the requirements cannot be met for both trip systems, the appropriate ACTIONS listed below shall be taken..." However, due to the presentation of the Notes in CTS Table 3.1.1, Note 3 actions are only taken after CTS Table 3.1.1 Note 2 actions are taken. Since the CTS Table 3.1.1 Note 2 Actions (proposed Table 3.1.1 ACTION Note 1) already provide the appropriate NRC approved actions for each of the conditions addressed in the first paragraph of CTS Table 3.1.1 Note 3, the first paragraph of CTS Table 3.1.1 Note 3 is unnecessary and is deleted. Since actions when required RPS channels are inoperable will continue to be taken in the same manner and in the same time period, the deletion is considered administrative in nature.

A.16 CTS 4.1.1 Table Notes 2 and 10 require an instrument check to be performed on the reactor water level, reactor pressure and IRM-High Flux RPS Trip Functions once per day. Proposed Table 4.1.1 includes explicit Check requirements for Trip Function 3.a (IRM-High Flux), Trip Function 5 (High Reactor Pressure) and Trip Function 7 (Low Reactor Water Level) with a specified Frequency of "Once/Day." Since this change only explicitly specifies the Trip Functions requiring Instrument Checks to be performed and does not change the intent of CTS, this change is considered administrative.

A.17 CTS Table 4.1.1 Note 4 and CTS Table 4.1.2 Note 2 state that tests are not required when systems are not required to be operable or are tripped and that if tests are missed, they shall be performed prior to returning the system to an operable status. The requirements of these Notes are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. In addition, the Bases for Specification 4.0.1 state that surveillances have to be met and performed in accordance with SR 4.0.2, prior to returning equipment to OPERABLE status. Since tests cannot be performed on a channel when it is tripped, those portions of the Notes are meaningless. CTS Specification 4.0.1, like the Notes, requires tests to be performed prior to the channel being required to be operable. Therefore, the requirements of Specification 4.0.1 are equivalent to those of CTS Table 4.1.1 Note 4 and CTS Table 4.1.2 Note 2, and these two Notes can be deleted. This change is considered administrative.

A.18 CTS Table 4.1.1 Note 6 specifies a Frequency not to exceed weekly. CTS Table 4.1.1 Note 6 currently applies to the Functional Test for the APRM High Flux (Reduced) Trip Function. The Frequency of CTS Table 4.1.1 Note 6 is explicitly stated as "Every 7 Days" for the Functional Test Frequency for Trip Function 4.b (APRM High Flux (Reduced) in proposed Table 4.1.1. Therefore, CTS Table 4.1.1 Note 6 is not required and its deletion is considered administrative.

A.19 CTS Table 4.1.1 Note 5 states that this instrumentation is exempt from the Instrument Functional Test Definition and that this Instrument Functional Test will consist of injecting a simulated electrical signal instrument into the measurement channels. The CTS definition 1.0.G, "Instrument Functional Test," allows the injection of a signal into the channel as close to the sensor as practicable. As such, the Functional Test described in CTS Table 4.1.1 Note 5 is adequately addressed by and complies with the CTS definition of Instrument Functional Test. Therefore, no exemption to the definition of Instrument Functional Test is required and the deletion of CTS Table 4.1.1 Note 5 is considered administrative.

A.20 CTS Table 4.1.2 Note 8 states that the specified Frequency is met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance. The allowance of this Note is duplicative of CTS SR 4.0.2, which states that periodic surveillance tests, checks, calibrations, and examinations shall be performed within the specified surveillance intervals and that these intervals may be adjusted plus 25%. As such, the allowance of CTS Table 4.1.2 Note 8 is adequately addressed by CTS SR 4.0.2. Therefore, the deletion of CTS Table 4.1.2 Note 8 is considered administrative.

A.21 With the exception of changes described in DOC A.8, LA.4 and M.6, the conversion of CTS Table 3.1.1 Note 2 to proposed Table 3.1.1 Note 1 results in no changes to actions taken by the user in response to a given plant condition. A comparison of the different sections of the two notes is provided below.

- The first sentence of CTS Note 2 states that "there shall be two operable or tripped trip systems for each Trip Function." The requirement for two operable trip systems has the same meaning as the condition in proposed Note 1 of "one or more required Reactor Protection System channels inoperable." The option in CTS Note 2 for the trip systems to be tripped matches the actions specified in proposed Notes 1.a and 1.b. The requirement in proposed Note 1 to "take all of the applicable Actions in Notes 1.a, 1.b, and 1.c" ensures that a loss of trip capability is addressed for all situations. This results in the proposed note being more restrictive for the case of the manual RPS trips as described in DOC M.6.

- The last sentences of CTS Notes 2.a and 2.b require the appropriate action in Note 3 to be performed as specified in Table 3.1.1. The last sentence of proposed Note 1 directs the identical action. CTS Note 3 is being converted to proposed Note 2.

- The first sentences of CTS Notes 2.a and 2.b are being reworded to become proposed Notes 1.a and 1.b with no change in meaning. The phrase "one less than the required minimum number of operable instrument channels" in CTS Note 2.a and "two or more channels less than the required minimum number of operable instrument channels" in Note 2.b have the same meaning, respectively, as the phrases "one or more required channels inoperable" in proposed Note 1.a and "one or more required channels inoperable in both trip systems" in Note 1.b .

- CTS Note 2.b.1 addresses a loss of trip capability by requiring that trip capability is verified within one hour. This note is being replaced by proposed Note 1.c which states that if trip capability is not maintained then it must be restored within one hour. These two requirements are equivalent since they both result in the same actions being taken. This change, along with the requirement in the first sentence of proposed Note 1 to "take all of the applicable Actions in Notes 1.a, 1.b, and 1.c" ensures that a loss of trip capability is addressed for all situations, as described in DOC M.6.

- CTS Note 2.b.2 is being reworded to become proposed Note 1.b with no change in meaning.

- CTS Note 2.b.3 is being deleted. This action is addressed by proposed Note 1.a for cases involving any number of inoperable channels due to the requirement in the first sentence of Note 1 to "take all of the applicable Actions in Notes 1.a, 1.b, and 1.c".

Therefore, the conversion of CTS Table 3.1.1 Note 2 to proposed Table 3.1.1 Note 1 is considered administrative.

A.22 CTS Bases Section 1.1C on CTS Page 13 incorrectly refers to "Specifications 1.1.1A or 1.1.1B." This has been corrected to read "Specifications 1.1A or 1.1B." This change is a reference correction and does not any alter the current action requirements. Therefore, this change is considered administrative in nature.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.1.1 Note 12 provides an allowance to not require the APRM High Flux (Reduced) Trip Function to be operable during refuel interlock checks which require the mode switch to be in startup if certain conditions are met. The allowance of CTS Table 3.1.1 Note 12 is no longer used and is deleted. Required refuel interlock checks are performed without the use of CTS 3.1.1 Note 12. This change represents an additional restriction on plant operation through the elimination of an allowance. The change is consistent with the ISTS, LCO 3.3.1.1 and Table 3.3.1.1-1, Trip Function 2.a, and with ISTS LCO 3.9.1 and 3.10.2.

M.2 CTS Table 3.1.1 specifies an Applicability of Startup and Run for the APRM Inop Trip Function. The APRM Inop Trip Function is a design feature that supports the other APRM Trip Functions. The other APRM Trip Functions are required to be operable in Run (for the APRM High Flux (Flow Bias) Trip Function) and Startup and Refuel with reactor coolant temperature > 212°F (for the APRM High Flux (Reduced) Trip Function). As such, the Applicability of the APRM Inop Trip Function is increased to also include Refuel with reactor coolant temperature > 212°F. This change represents an additional restriction on plant operation to ensure the APRM Inop Trip Function is operable to support the other APRM Trip Functions. This change is consistent with the ISTS, Table 3.3.1.1-1, Trip Function 2.e.

M.3 For CTS Table 3.1.1, Trip Function 4, for APRM Inop, two shutdown alternatives are provided when minimum conditions for operation are not satisfied. One of these shutdown alternatives (CTS Table 3.1.1 Note 3.A) requires immediate insertion of operable rods and complete insertion of operable rods within 4 hours. The other shutdown alternative (CTS Table 3.1.1 Note 3.B) requires power to be reduced to the IRM range and the reactor mode switch to be placed in the "Startup/Hot Standby" position within 8 hours. The applicability of the APRM Inop Trip Function is currently Run and Startup. As a result, if the optional shutdown action of CTS Table 3.1.1 Note 3.B is selected to be taken (when the minimum conditions for operation are not satisfied for the APRM Inop Trip Function), the plant would still be in an applicable Mode of the associated Trip Function. Therefore, the deletion of the optional shutdown action (CTS Table 3.1.1 Note 3.B) for the APRM Inop Trip Function ensures that the shutdown action required to be taken for this Trip Function actually results in exiting the Mode of Applicability for the Trip Function. This change represents an additional restriction on plant operation and is consistent with the ISTS, LCO 3.3.1.1, Table 3.3.1.1-1, Trip Function 2.e and referenced Action Note G.

M.4 (not used)

M.5 CTS Table 3.1.1 Note 1 provides the option to require either the IRM High Flux Trip Function or the SRM High Flux in coincidence Trip Function to be operable when the reactor is in Refuel and reactor water temperature is less than 212°F. The allowance to substitute the SRM High Flux in coincidence Trip Function for the IRM High Flux Trip Function is deleted since it will no longer be used. Instead the IRM High Flux Trip Function will be required to be operable in this condition. This change represents an additional restriction on plant operation through elimination of an allowance. In addition, the IRM Inop Trip Function is a design feature that supports the IRM High Flux Trip Function. As such, the applicability of the IRM Inop Trip Function is increased to also include Refuel with reactor coolant temperature less than or equal to 212°F. This change represents an additional restriction on plant operation to ensure the IRM Inop Trip Function is operable to support the IRM High Flux Trip Function. These changes are consistent with the ISTS, Table 3.3.1.1-1, Trip Functions 1.a, 1.b.

M.6 With one manual RPS channel inoperable in one trip system, a manual RPS trip will not occur due to the VYNPS design of these Trip Functions. Therefore, 12 hours (CTS Table 3.1.1 Note 2.a) is reduced to 1 hour in proposed Table 3.1.1 ACTION Note 1.c. Proposed Table 3.1.1 ACTION Note 1.c limits the time to restore RPS trip capability to 1 hour when inoperability in one or both manual Trip Functions (Manual Scram and Reactor Mode Switch in Shutdown) results in a loss of RPS trip capability (i.e., one or two channels inoperable in one or both Trip Functions). This change is an additional restriction on plant operation necessary to achieve consistency with the ISTS, LCO 3.3.1.1, Action Note C.

M.7 Deleted.

M.8 For the APRM High Flux (Reduced) Trip Function, an additional Frequency for performance of an Instrument Functional Test is provided in proposed Table 4.1.1. Currently, the Instrument Functional Test of this Trip Function is required to be performed before each startup with a Frequency that need not exceed weekly and weekly during Refueling. The additional Frequency to be provided for this Trip Function is "Every 7 Days During Each STARTUP/HOT STANDBY." This additional restriction ensures that the instrumentation is maintained operable in the Mode of applicability. In addition, for consistency and accuracy, the "weekly" Frequencies for prior to startup and during refueling are being changed to "within 7 days before entering STARTUP/HOT STANDBY" and "every 7 days during REFUELING," respectively. These changes are consistent with the ISTS, LCO 3.3.1.1, SR 3.3.1.1.4.

M.9 In CTS Table 4.1.2, the current Calibration Frequency for the First Stage Turbine Pressure Permissive is "Every 6 Months and After Refueling." In proposed Table 4.1.1, the Calibration Frequency of the First Stage Turbine Pressure Permissive is "Every 6 months and prior to entering STARTUP/HOT STANDBY for plant startup after Refueling." Specifying the time period to complete the Calibration after Refueling represents an additional restriction on plant operation necessary to ensure that the permissive is calibrated in a timely manner prior to startup after Refueling. Although acknowledging that the Turbine Stop Valve Closure and Turbine Control Valve Fast Closure scram functions are not required at low Reactor Thermal Power (RTP), ISTS Table 3.3.1.1-1 and the associated LCO 3.3.1.1 Bases do not include First Stage Turbine Pressure Permissive instrumentation or a specific allowance for bypassing these scram functions at low RTP, as is provided for in the Vermont Yankee CTS. Consequently, the 3.3.1.1 Surveillance Requirements table does not include comparable Calibration requirements for this instrumentation.

M.10 Deleted.

M.11 CTS Table 4.1.2 only includes explicit requirements to calibrate APRM trip units every 3 months. Proposed Table 4.1.1 requires calibration of the trip units of the following additional Trip Functions every 3 months: High Reactor Pressure (proposed Table 4.1.1 Trip Function 5); High Drywell Pressure (proposed Table 4.1.1 Trip Function 6); Reactor Low Water Level (proposed Table 4.1.1 Trip Function 7); and Scram Discharge Volume High Level (proposed Table 4.1.1 Trip Function 8). The trip units of these Trip Functions are currently required by CTS Table 4.1.2 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. The change is consistent with LCO 3.3.1.1, SR 3.3.1.1.8 and Table 3.3.1.1-1 for these Trip Functions.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Tables 3.1.1, 4.1.1, and 4.1.2 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.1.A and Table 3.1.1 require the RPS Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.1.1 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required RPS Trip Functions is maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 Details of the methods for performing CTS Table 3.1.1 Note 3.b (proposed Table 3.1.1 ACTION Note 2.b), associated with placing the reactor mode switch in Startup/Hot Standby (i.e., reduce power level to the IRM range), are to be relocated to plant procedures. These details are not necessary to ensure the shutdown action of placing the reactor mode switch in Startup/Hot Standby and exiting the applicable Mode of the associated RPS instrumentation is accomplished. The requirements of proposed Table 3.1.1 and Table 3.1.1 ACTION Note 2.b are adequate to ensure this action is accomplished. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the plant procedures are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 Deleted

LA.4 The details in the CTS Table 3.1.1 Note 2 "*" and "**" Notes, relating to placing channels in trip, are to be relocated to Specification 3.1.A Bases. The requirements of proposed Table 3.1.1 ACTIONS Notes ensure inoperable channels are placed in trip or the unit is placed in a non-applicable Mode or condition, as appropriate. As a result, the relocated details in "*" and "**" Notes are not necessary for ensuring the appropriate actions are taken in the event of inoperable RPS channels. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.5 CTS Table 3.1.1 Note 4 contains design and operational details of the APRM High Flux (Flow Bias) Trip Function Trip Setting for two recirculation loop and single recirculation loop operation. These details are not necessary to ensure the operability of APRM High Flux (Flow Bias) Trip Function. Therefore, the information in this note is to be relocated to Specification 3.1.A Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.1.A and associated Table 3.1.1 which includes APRM High Flux (Flow Bias) Trip Function Trip Settings for both two recirculation loop and single recirculation loop operation are adequate to ensure the APRM High Flux (Flow Bias) Trip Function is maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.6 The LPRM inputs for operability of the APRM in CTS Table 3.1.1 Note 5 are relocated to Specification 3.1.A Bases. The Specification 3.1.A Bases indicates that if sufficient LPRMs are not available (the same requirements as specified in CTS Table 3.1.1, Note 5), then the associated APRM is inoperable. As such, CTS Table 3.1.1 Note 5 is not necessary in VYNPS TS RPS Instrumentation Table 3.1.1. The definition of operability suffices. Therefore, the relocated details of the note are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.7 For Trip Settings associated with reactor vessel water level, CTS Table 3.1.1 Note 6 states that the top of enriched fuel has been designated as 0 inches and provides common reference level for all vessel water level instrumentation. This detail is to be relocated to the Bases. This reference is not necessary to be included in the VYNPS TS to ensure the operability of the RPS instrumentation. Operability requirements are adequately addressed in proposed Specification 3.1.A, Table 3.1.1 and the specified Trip Setting. As such, this relocated reference is not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.8 CTS Table 3.1.1 Note 10 states that the Turbine Stop Valve Closure and Turbine Control Valve Fast Closure scram signals may be bypassed at < 25% of reactor Rated Thermal Power. The design of these Trip Functions is that they are automatically bypassed when reactor power is < 25% of reactor Rated Thermal Power as measured by turbine first stage pressure. The system design details in CTS Table 3.1.1 Note 10 are to be relocated to the Bases and the reference to this information is deleted from the VYNPS TS. These design details are not necessary to be included in the TS to ensure the operability of the RPS instrumentation since operability requirements are adequately addressed in proposed Specification 3.1.A. Therefore, these relocated details are not required to be in the TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.9 CTS Table 4.1.1 Note 8 requires the performance of a reactor vessel water level perturbation test once every month. This requirement is proposed to be relocated from the VYNPS TS to plant procedures. This test is not directly related to verifying the operability of the Low Reactor Water Level Trip Function. The Instrument Functional Test and Calibration Surveillance Requirements in proposed Table 4.1.1 are adequate to ensure that the Low Reactor Water Level Trip Function is verified and maintained operable. Therefore, this relocated requirement is not required to be in the TS to provide adequate protection of the public health and safety. Changes to the plant procedures are controlled by the provisions of 10 CFR 50.59. Not including this requirement in TS is consistent with the ISTS.

LA.10 Proposed Surveillance Requirement 4.1.A.4 requires a Logic System Functional Test (LSFT) of the Reactor Protection System once every Operating Cycle. CTS Table 4.1.1 and associated Note 7 describe details of the performance of Logic System Functional Tests of the RPS. These details are being deleted since they are not necessary to ensure the operability of the RPS. The VYNPS TS definition of LSFT, Definition 1.0.H, provides the required details for performance of an LSFT and is adequate to ensure RPS is maintained operable. As such, these details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Not including these details in TS is consistent with the ISTS.

LA.11 CTS Table 4.1.2 Note 6 provides details on how to perform the calibration of position switches (for the Turbine Stop Valve Closure Trip Function and the Main Steam Line Isolation Valve Closure Trip Function). The details of the methods of performing Surveillances in CTS Table 4.1.2 Note 6 are to be relocated to the Bases. The requirements of Specification 3.1.A and the associated Surveillance Requirements (including the requirement for periodic calibrations) for the RPS instruments are adequate to ensure the instruments are maintained operable. As such, the details of the methods of performing Surveillances are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.12 CTS Table 4.1.2 Note 5 indicates that LPRMs do not provide a scram function. These system design details are to be relocated to the Bases and the reference to this information is deleted from the VYNPS TS. These design details are not necessary to be included in the TS to ensure the operability of the RPS instrumentation since operability requirements are adequately addressed in proposed Specification 3.1.A. Therefore, these relocated details are not required to be in the TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.13 The last sentence of CTS Table 4.1.1 Note 9 states that the automatic scram contactors shall also be exercised after maintenance of the contactors. This post maintenance testing requirement is to be relocated to plant procedures. Post maintenance testing requirements are not necessary to ensure the operability of the RPS instrumentation. Any time the operability of a system or component has been affected by repair, maintenance, or replacement of a component, post maintenance testing is required to demonstrate operability of the system or component. Therefore, explicit post maintenance testing Surveillance Requirements are not required to be in the TS to provide adequate protection of the public health and safety. Changes to plant procedures are controlled by the provisions of 10 CFR 50.59. Not including this post maintenance test requirement in TS is consistent with the ISTS.

"Specific"

L.1 <u>Discussion of Changes</u>

Change 1: In Refuel, if reactor water temperature is less than 212°F, CTS Table 3.1.1 Note 1 requires the Reactor Mode Switch in Shutdown Position Trip Function, Manual Scram Trip Function, IRM High Flux Trip Function, and the Scram Discharge Volume High Water Level Trip Function to be operable. Proposed Table 3.1.1 only requires these Trip Functions to be operable in Refuel when reactor water temperature is less than or equal to 212°F (the change to less than or equal to 212°F is addressed in DOC L.11 below) and when a control rod is withdrawn from a core cell containing one or more fuel assemblies (proposed Table 3.1.1 Footnote (b)). This is consistent with the ISTS, LCO 3.3.1.1, Action Note H and Table .3.1.1-1, Trip Functions 1, 7, 10, 11.

Change 2: The applicability of Refuel with reactor water temperature less than or equal to 212°F is modified, as discussed above, to only require RPS Trip Functions to be operable in Refuel with reactor water temperature less than or equal to 212°F and any control rod withdrawn from a core cell containing one or more fuel assemblies. In addition, proposed Table 3.1.1 ACTION Note 2.d only requires action to be initiated to fully insert control rods in core cells containing one or more fuel assemblies. The Actions for inoperable equipment in Refuel with reactor water temperature less than or equal to 212°F are also revised to be consistent with the proposed applicability. This is consistent with the ISTS, LCO 3.3.1.1, Action Note H and Table 3.3.1.1-1, Trip Functions 1, 7, 10, 11.

Change 3: CTS Table 3.1.1 Note 3.a, "...complete insertion of... control rods within four hours" is revised in proposed Table 3.1.1 ACTION Note 2.d, to "immediately initiate action to insert...." This is consistent with the ISTS, LCO 3.3.1.1, Action Note H and Table 3.3.3.1-1, Trip Functions 1, 7, 10, 11.

Justification

Change 1 is acceptable for the following reasons. Control rods withdrawn from or inserted into core cells containing no fuel assemblies have a negligible impact on the reactivity of the core and therefore are not required to be operable with the capability to scram. Provided all rods in cells containing fuel otherwise remain inserted, the RPS Trip Functions serve no purpose and are not required to provide protection against unexpected reactivity excursions. In this condition the required Shutdown Margin (TS 3.3.A.1) and the required one-rod-out interlock (TS 3.12.A – With the mode switch in the refuel position, only one control rod can be withdrawn) ensure no event requiring RPS will occur.

Change 2 is acceptable for the following reasons. In Refuel with reactor water temperature less than or equal to 212°F, the RPS Trip Functions provide protection against unexpected reactivity excursions by initiating a scram of the control rods. Control rods withdrawn from or inserted into a core cell containing no fuel assemblies have a negligible impact on the reactivity of the core and therefore are not required to be operable with the capability to scram. Provided all rods in cells containing fuel otherwise remain inserted, the RPS Trip Functions serve no purpose and are not required to provide protection against unexpected reactivity excursions. In this condition the required Shutdown Margin (TS 3.3.A.1) and the required one-rod-out interlock (TS 3.12.A – With the mode switch in the refuel position, only one control rod can be withdrawn) ensure no event requiring RPS will occur. Since all control rods are required to be fully inserted during fuel movement, the applicable conditions cannot be entered while moving fuel. The only possible core alteration or positive reactivity change is control rod withdrawal that is adequately addressed by proposed Table 3.1.1. ACTION Note 2.d.

Change 3 is acceptable for the following reasons. During Refuel with reactor water temperature less than or equal 212°F, it may not be possible to immediately insert all insertable control rods. In this situation, the CTS do not provide direction as to the action to take if control rods cannot be inserted immediately. In addition, if the control rod is incapable of being inserted in 4 hours, the CTS Actions appear to result in the requirement to initiate an LER. The intent of the CTS Actions is more appropriately presented in proposed Table 3.1.1 ACTION Note 2.d. Proposed Table 3.1.1 ACTION Note 2.d requires immediate initiation of action to insert all insertable control rods and requires attempts to insert all insertable control rods to continue until all insertable control rods are inserted. This change ensures that actions are taken to insert all insertable control rods in a timely manner while continuing to provide direction if attempts fail to immediately insert all insertable control rods. This change is considered to be acceptable since proposed Table 3.1.1 ACTION Note 2.d does not preclude, but continues to require, action to fully insert all insertable control rods which will continue to ensure that the safety functions of the associated RPS Instrumentation Trip Functions are satisfied as additional control rods become capable of being inserted.

L.2 Discussion of Change

The Actions associated with RPS instrumentation in CTS Table 3.1.1 Note 3.a requires immediate initiation of insertion of operable rods and complete insertion of all operable control rods (i.e., placing the reactor in Hot Shutdown) within four hours. In proposed Table 3.1.1 ACTION Note 2.a, the requirement is to be in Hot Shutdown within 12 hours. This is consistent with the ISTS, LCO 3.3.3.1, Action Note G and Table 3.3.1.1-1, Trip Functions 1, 2, 3, 4, 6, 7, 10, 11.

Justification

This change is acceptable for the following reasons. The 12 hour Completion Time is considered reasonable, based on operating experience, to reach Hot Shutdown. In many instances, CTS Table 3.1.1 Note 3.a applies to Trip Functions that are required to be operable in Run mode. Therefore, the action could require plant shutdown from full power to Hot Shutdown within four hours. It is likely that under some circumstances, inserting a manual scram would be necessary in order to comply with this requirement. Allowing 12 hours to reach Hot Shutdown is acceptable since the risk of an event during the time period (i.e., extra 8 hours) to reach Hot Shutdown is not significantly increased, versus the potentially greater risk of a unit upset that could challenge safety systems resulting from a rapid plant shutdown (i.e. immediately initiating insertion of control rods and completing insertion within four hours).

L.3 Discussion of Change

CTS Table 3.1.1, for the Main Steam Line Isolation Valve (MSIV) Closure Trip Function, requires the reactor to be placed in Hot Shutdown (CTS Table 3.1.1 Note 3.a) or to close the main steam isolation valves, which will cause a reactor trip placing the reactor in Hot Shutdown (CTS Table 3.1.1 Note 3.c). However, the Main Steam Line Isolation Valve Closure Trip Function is only required to be operable in Run. Therefore, the appropriate action to take when minimum conditions for operation are not satisfied for the Main Steam Line Isolation Valve Closure Trip Function is to place the reactor in Startup/Hot Standby within 8 hours (proposed Table 3.1.1 ACTION Note 2.b). This is consistent with the ISTS, LCO 3.3.1.1, Action Note F and Table 3.3.1.1-1, Trip Function 5.

Justification

This change is acceptable for the following reasons. The Main Steam Line Isolation Valve Closure Trip Function is only required to be operable in Run since, with the MSIVs open and the heat generation rate high, a pressurization transient can occur if the MSIVs close. In Startup/Hot Standby and Refuel with coolant temperature > 212°F, the heat generation rate is low enough so that the other diverse RPS functions identified for these Modes of Applicability in proposed Table 3.1.1, as modified by Footnote (a), provide sufficient protection. Therefore, the appropriate action to take when minimum conditions for operation are not satisfied for the Main Steam Line Isolation Valve Closure Trip Function is to place the reactor in Startup/Hot Standby within 8 hours (proposed Table 3.1.1 ACTION Note 2.b). This action places the reactor in a Mode in which the Main Steam Line Isolation Valve Closure Trip Function is no longer required to be operable. The time period for reaching Startup/Hot Standby is consistent with the existing time period provided in CTS Table 3.1.1 Note 3.b.

L.4 Discussion of Change

CTS Table 3.1.1 Note 3.d applies to the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions and requires, when minimum conditions for operation are not satisfied, that reactor power be reduced to less than 25% of Rated Thermal Power within 8 hours. Proposed Table 3.1.1 ACTION Note 2.c revises this requirement to state that reactor power must be reduced to less than or equal to 25% of rated within 8 hours. This action places the reactor in a Mode in which the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions are no longer required to be operable. This is consistent with the ISTS, LCO 3.3.1.1, Action Note E and Table 3.3.1.1-1, Trip Function 9, with the clarification that the 4 hour completion time shown in ISTS was retained at 8 hours.

Justification

This change is acceptable for the following reasons. Proposed Table 3.1.1 ACTION Note 2.c revises this requirement to reflect exiting the condition of applicability. The applicability of the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions is based on CTS Table 3.1.1 Note 10, which states that the signals for these Trip Functions may be bypassed when power is $\leq$ 25% of Rated Thermal Power. The intent of this note is to waive the operability requirements of the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions when reactor power is $\leq$ 25% (i.e., the applicability of these Trip Functions is when reactor power is greater than 25%). Therefore, proposed Table 3.1.1 ACTION Note 2.c is relaxed to require reducing reactor power to $\leq$ 25% of Rated Thermal Power. This action places the reactor in a Mode in which the Turbine Control Valve Fast Closure and Turbine Stop Valve Trip Functions are no longer required to be operable. This Trip Function is not required when Thermal Power is $\leq$ 25% Rated Thermal Power, since the High Reactor Pressure and the Average Power Range Monitor High Flux (Flow Bias) Trip Functions are adequate to maintain the necessary safety margins.

L.5 Discussion of Change

CTS Tables 4.1.1 and 4.1.2 and associated Notes (Table 4.1.1 Note 3 and Table 4.1.2 Note 1) contain design information related to the groups for each of the RPS Trip Function scram sensors. Information on groups for RPS Trip Functions is deleted and is not included in proposed Table 4.1.1. This change is consistent with the ISTS, LCO 3.3.1.1, Surveillance Requirements table.

Justification

This change is acceptable for the following reasons. The purpose of the grouping was to identify the bases for the frequency of testing and calibration of the Trip Functions. This information is no longer used or necessary for this purpose. For example, Instrument Functional Test Frequencies are now based on reliability studies and operating experience and Instrument Calibration Frequencies are based on the magnitude of equipment drift included in the associated setpoint calculations. Proposed Table 4.1.1 adequately describes the Frequencies of the Functional Tests and Calibration without the need to refer to groups.

L.6 Discussion of Change

Footnote (b) to Table 4.1.1 is added for the APRM High Flux (Reduced) Trip Function 4.b to exempt the Functional Test and Calibration requirements until 12 hours after entering Startup/Hot Standby from Run. Footnote (b) to Table 4.1,.1 is already present and applicable to the IRM High Flux and Inop Trip Functions 3.a and 3.b. The wording of Footnote (b) is being changed to clarify that the surveillance must be completed within the specified time limit. This footnote provides an exception to SR 4.0.1 by allowing operability in the specified mode for 12 hours without the required Surveillances being completed. This Frequency is consistent with the ISTS, LCO 3.3.1.1, SR 3.3.1.1.4 and SR 3.3.1.1.9.

Justification

This change is acceptable for the following reasons. The APRM High Flux (Reduced) Trip Function is required in Startup/Hot Standby, but not in Run, and the required Surveillances cannot be performed in Run (prior to entry in the applicable Startup/Hot Standby) without utilizing jumpers or lifted leads. Use of these devices is not recommended since errors in their use may significantly increase the probability of a reactor transient or event that is a precursor to a previously analyzed accident. Therefore, time is allowed to conduct the Surveillances after entering the applicable Mode. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the surveillance.

L.7 Discussion of Change

CTS Table 4.1.1 requires performing a Functional Test on alarms of certain RPS Trip Functions. The proposed Table 4.1.1 Functional Test requirement does not include RPS Trip Function alarms. This change is consistent with the ISTS, LCO 3.3.1.1, Surveillance Requirements table.

Justification

RPS Trip Function alarms are not credited in any accident or transient analysis. This change is acceptable since the operability of the RPS Trip Functions will still be confirmed during the Functional Test, Calibrations, and RPS Response Time Test surveillances. As such, the safety function assumed in the safety analysis for the RPS instrumentation will continue to be demonstrated as required by the TS Surveillances.

L.8 Discussion of Change

CTS Table 4.1.2 lists calibration standards to be used when performing Calibrations of

RPS Trip Functions. Listed calibration standards are not required and are deleted. This change is consistent with the ISTS, LCO 3.3.1.1, Surveillance Requirements table.

Justification

This change is acceptable for the following reasons. Details concerning calibration standards are not necessary to ensure the operability of the RPS instrumentation. The VYNPS TS definition of Instrument Calibration, the requirements of proposed Specification 3.1.A, and the associated Surveillance Requirements (including the requirements to periodically perform Instrument Calibrations) are adequate to ensure the RPS instrumentation is maintained operable.

L.9 (not used)

L.10 Discussion of Change

A footnote is added to the APRM High Flux (output signal) heat balance calibration (CTS Table 4.1.2 and proposed Table 4.1.1 Trip Function 4.a and Footnote (d)) that states the Surveillance is not required to be completed until 12 hours after reactor power ≥ 23% Rated Thermal Power. This footnote provides an exception to SR 4.0.1 by allowing operability in the specified mode for 12 hours without the required Surveillance being completed. The change is consistent with the ISTS, LCO 3.3.1.1, SR 3.3.1.1.2.

Justification

This change is acceptable for the following reasons. It is difficult to accurately determine core Thermal Power from a heat balance < 23% Rated Thermal Power. If the process computer were unavailable, the time required to manually perform the heat balance, analyze results, and calibrate the APRMs is approximately 9 hours. Therefore, a 12 hour time period is provided to perform the required activities in an orderly manner after reaching 23% Rated Thermal Power. At low power levels, a high degree of accuracy, associated with the APRM calibrations, is unnecessary because of the large inherent margin to thermal limits (MCPR and APLHGR).

A similar allowance was added to TS 4.11.A, B and C by Amendment No. 188 which was issued on June 21, 2000. Among other things, the Safety Evaluation for Amendment No. 188 stated that: "This change is also acceptable because it ensures that within a reasonable time after reaching 25% RTP, the reactor is operating within the assumptions of the safety analysis."

L.11 Discussion of Change

In Refuel, if reactor water temperature is less than 212°F, CTS Table 3.1.1 Note 1 requires the Reactor Mode Switch in Shutdown Position Trip Function, Manual Scram Trip Function, IRM High Flux Trip Function, and the Scram Discharge Volume High Water Level Trip Function to be operable. Proposed Table 3.1.1 and TS 2.1.A.1.b only require these Trip Functions to be operable in Refuel when reactor water temperature is less than or equal to 212°F and when a control rod is withdrawn from a core cell containing one or more fuel assemblies (the change associated with the status of control rods in core cells is addressed in change L.1 above), Table 1.1-1, Mode 5, Footnote (a) and Table 3.3.1.1-1, Trip Functions 1, 7, 10, 11.

Justification

This change is acceptable for the following reasons. The change in the applicability in this condition from "when reactor water temperature is less than 212°F" to "when reactor water temperature is less than or equal to 212°F" is being done to provide consistent applicable Mode requirements across the VYNPS TS and to be consistent with the ISTS. This change is consistent with the definition of Cold Shutdown (VYNPS Definition V) which includes reactor water temperature of less than or equal to 212°F. With respect to reactor water temperature, the difference between the current applicability and the proposed applicability for these RPS Trip Functions is negligible and has no adverse impact on plant safety.

L.12 Discussion of Change

CTS Table 4.1.2 requires the performance of a heat balance calibration of the APRM High Flux Output Signal (Reduced) once every 7 days. Consistent with ISTS Table 3.3.1.1-1, Trip Function 2.a, this requirement is deleted and replaced with the requirement to perform a Calibration on a frequency consistent with that for the Functional Test for this trip function. Proposed Table 4.1.1 Trip Function 4.b requires a Calibration to be performed within 7 days before entering STARTUP/HOT STANDBY, every 7 days during STARTUP/HOT STANDBY and every 7 days during refueling. The Calibration requirement is modified by Footnote (b) that provides a 12-hour time period for completion of the calibration upon entering STARTUP/HOT STANDBY from RUN, Footnote (c) that excludes neutron detectors from the calibration, and Footnote (e) that defines the calibration as a trip unit calibration. The change, including the modification of the Calibration requirement by Footnotes (b) and (c) ,. is consistent with the ISTS, LCO 3.3.1.1, SR 3.3.1.1.9 with the clarification that a Trip Unit Calibration will be performed coincident with the Functional Test on a 7-day frequency during STARTUP/HOT STANDBY in lieu of the 184-day Channel Calibration frequency.

Justification

These changes are acceptable for the following reasons. The APRM High Flux (Reduced) Trip Function is required to be operable in Startup/Hot Standby and in Refuel. In the applicable Modes for this RPS Trip Function, reactor power cannot exceed 15% without generating a reactor trip. However, at reactor power levels < 23% Rated Thermal Power, it is difficult to accurately determine core Thermal Power from a heat balance. Replacing the heat balance calibration requirement for the APRM High Flux (Reduced) Trip Function with a trip unit calibration provides adequate assurance that the RPS Trip Function will be capable of satisfying its required function because, at low power levels, a high degree of accuracy associated with the APRM calibrations is unnecessary due to the large inherent margin to thermal limits (MCPR and APLHGR). The change to the Calibration Frequency is a clarification that removes ambiguity regarding the Modes of Applicability for this calibration activity, and aligns the frequency with the FT surveillance requirement.

(Change L.6). The APRM High Flux (Reduced) Trip Function is required in Startup/Hot Standby, but not in Run, and the required Surveillances cannot be performed in Run (prior to entry in the applicable Startup/Hot Standby) without utilizing jumpers or lifted leads. Use of these devices is not recommended since errors in their use may significantly increase the probability of a reactor transient or event that is a precursor to a previously analyzed accident. Therefore, time is allowed to conduct the Surveillances after entering the applicable Mode. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the surveillance. Modifying the calibration requirement by a footnote that excludes neutron detectors from the calibration is acceptable since they are passive devices, with minimal drift, and because of the difficulty in simulating a meaningful signal. Changes in LPRM neutron detector sensitivity are compensated for by performing the 7-day heat balance calibration and the 2000 MWD/T LPRM calibration against the TIP System.

RELOCATED SPECIFICATIONS

None

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.B

ECCS System

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.A/4.2.A, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 34 – Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.B/4.2.B and 3.2.C/4.2.C to their own separate set of pages.
- Table 3.2.1, pages 38 through 42 - Title and column headings modified for accuracy, trip function line items given specific sequential numbering, columns repositioned for clarity and consistency and ACTION Notes renumbered to agree with new Notes page.
- Table 3.2.1 Notes, pages 44, 44a and 44b – Header changed to read "ACTION Notes," Notes renumbered to adjust for deletions, and new Notes 1 through 8 rewritten to include specific Trip Function designations in lieu of general system names.
- Table 4.2.1, pages 59 through 62 - Title and column headings modified for accuracy, trip function line items given specific sequential numbering, blank entries currently shown as "--" or "None" changed to "NA" and columns repositioned to place most frequent activity (Check) first.
- Table 4.2 Notes, page 74 – "Not Used" and "Deleted" removed wording where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.10, A.11, A.13, A.15, A.16, A.17 and LA.5 below.)

A.2 CTS 3.2.A specifies an Applicability for Emergency Core Cooling System (ECCS) instrumentation of "When the system(s) it initiates or controls is required in accordance with Specification 3.5." Specification 3.5 includes the requirements for the ECCS. This change provides an explicit Applicability, in proposed Table 3.2.1 for each ECCS instrumentation trip function. The specified Applicabilities, in proposed Table 3.2.1, are consistent with the Modes and conditions when the associated ECCS are required to be operable by Specification 3.5, except as provided and justified in DOC L.1 and L.4 below. This is detailed for each ECCS below:

- Per CTS 3.5.A, Core Spray is required to be operable whenever irradiated fuel is in the reactor vessel. Therefore, most Core Spray Trip Functions are required by proposed Table 3.2.1 to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212 °F. In addition, CTS 3.5.H specifies limited operability requirements for shutdown conditions. Therefore, in order to address the requirements of CTS 3.5.H, proposed Table 3.2.1 includes a requirement of "when associated ECCS subsystem is required to be operable" for most Core Spray Trip Functions. There are two exceptions to these proposed requirements. Trip Function 1.a, High Drywell Pressure, is only required to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212 °F, as discussed in DOC L.1. Trip Function 1.f, Pump Discharge Pressure, is only required to be operable in Run and in Startup/Hot Standby, Hot Shutdown and Refuel with reactor steam pressure > 150 psig. Trip Function 1.f feeds the Automatic Depressurization System (ADS) logic rather than the Core Spray logic. Therefore, the applicability of this trip matches the ADS applicability of "any time the reactor pressure is above 150 psig and irradiated fuel is in the reactor vessel" as specified in CTS 3.5.F.

- Per CTS 3.5.A, Low Pressure Coolant Injection (LPCI) is required to be operable whenever irradiated fuel is in the reactor vessel. Therefore, most LPCI Trip Functions are required by proposed Table 3.2.1 to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212 °F. In addition, CTS 3.5.H specifies limited operability requirements for shutdown conditions. Therefore, in order to address the requirements of CTS 3.5.H, proposed Table 3.2.1 includes a requirement of "when associated ECCS subsystem is required to be operable" for most LPCI Trip Functions. There are four exceptions to these proposed requirements. Trip Function 2.b, High Drywell Pressure (Initiation), Trip Function 2.d, Reactor Vessel Shroud Level, and Trip Function 2.g, High Drywell Pressure (Containment Spray Permissive), are only required to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212 °F, as discussed in DOCs L.1 and L.4. Trip Function 2.f, Pump Discharge Pressure, is only required to be operable in Run and in Startup/Hot Standby, Hot Shutdown and Refuel with reactor steam pressure > 150 psig. Trip Function 2.f feeds the Automatic Depressurization System (ADS) logic rather than the LPCI logic. Therefore, the applicability of this trip matches the ADS applicability of "any time the reactor pressure is above 150 psig and irradiated fuel is in the reactor vessel" as specified in CTS 3.5.F.

- Per CTS 3.5.E, High Pressure Coolant Injection (HPCI) is required to be operable whenever irradiated fuel is in the reactor vessel and reactor steam pressure is greater than 150 psig. Therefore, all HPCI Trip Functions are required by proposed Table 3.2.1 to be operable in Run and in Startup/Hot Standby, Hot Shutdown and Refuel with reactor steam pressure > 150 psig.

- Per CTS 3.5.F, Automatic Depressurization System (ADS) is required to be operable whenever irradiated fuel is in the reactor vessel and reactor steam pressure is greater than 150 psig. Therefore, all ADS Trip Functions are required by proposed Table 3.2.1 to be operable in Run and in Startup/Hot Standby, Hot Shutdown and Refuel with reactor steam pressure > 150 psig.

Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.3 CTS 4.2.A specifies that instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.1. In proposed Surveillance Requirement

(SR) 4.2.A.1, the reference to "and logic system," is deleted since associated logic systems are considered part of the ECCS instrumentation Trip Functions as stated in Change L.5. It is not necessary to explicitly identify logic systems in proposed SR 4.2.A.1 since proposed SR 4.2.A.2 (relocated CTS Table 4.2.1 requirements to perform Functional Tests of Trip System Logic) continues to require performance of surveillance testing of Trip System Logic (i.e., performance of Logic System Functional Tests for each ECCS instrumentation Trip Function). Therefore, this change is considered administrative.

A.4 CTS 4.2.A includes reference to CTS Table 4.2.1 for functional test and calibration requirements for ECCS instrumentation. CTS 4.2.A is revised, in proposed SR 4.2.A.1, to also include reference to check requirements consistent with CTS Table 4.2.1. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain ECCS instrument trip functions. Therefore, this change is considered administrative in nature.

A.5 CTS Table 3.2.1, Notes 8 and 9, provide allowances to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances. These allowances are moved to proposed SR 4.2.A.1 and the allowances of these two notes are combined. This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.6 The CTS Table 3.2.1 Note 5 requirement to apply the action requirements of Specification 3.5, when the support system (i.e., ECCS instrumentation trip functions) are inoperable and the actions of Note 5 are applied, is an unnecessary reminder to follow Technical Specification requirements. The actions of Note 5 require the supported systems to be declared inoperable. The reference to "and the requirements of Specification 3.5 apply" is essentially a "cross reference" between Technical Specifications that has been determined to be adequately provided through training. Therefore, the deletion is considered to be administrative. This change is consistent with the ISTS. The deletion of the remainder of CTS Table 3.2.1 Note 5 is discussed in Change L.5.

A.7 CTS Table 3.2.1 Note 8 includes requirements for both ECCS instrumentation and Recirculation Pump Trip instrumentation. The CTS Table 3.2.1 Note 8 requirements applicable to the Recirculation Pump Trip instrumentation are physically moved to proposed SR 4.2.I.1. The movement of the existing requirements is considered administrative.

A.8 CTS 3.2.1 and 4.2.1 provide requirements related to the Low Reactor Pressure (PS-2-128A and B) Trip Function. This trip function acts to isolate the Residual Heat Removal Shutdown Cooling System when reactor pressure is > 150 psig. Therefore, the associated requirements are physically moved to proposed Specification 3.2.B and 4.2.B, Primary Containment Isolation. The movement of the existing requirements is considered administrative and is consistent with the ISTS.

A.9 CTS 3.2.1 and 4.2.1 provide requirements related to Recirculation Pump Trip instrumentation. The requirements applicable to the Recirculation Pump Trip instrumentation, including CTS Table 3.2.1 Note 2, are physically moved to proposed TS 3.2.I/4.2.I, Tables 3.2.7 and 4.2.7. The movement of the existing requirements is considered administrative and is consistent with the ISTS. (See TS 3.2.1/4.2.I DOC L.1 for final disposition of CTS Table 3.2.1 Note 2.)

A.10 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to be operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.11 CTS Table 4.2.1 includes a requirement to perform a calibration of Trip System Logic once per Operating Cycle. This requirement is modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." In proposed Table 4.2.1, this requirement is reflected with explicit requirements to perform calibrations of the required ECCS instrumentation time delay relays and timers (i.e., proposed Table 4.2.1 Trip Function 1.e., Core Spray Pump Start Time Delay, Trip Function 2.e, LPCI B and C Pump Start Time Delay, Trip Function 4.c, Automatic Depressurization System (ADS) Time Delay, and Trip Function 4.d, ADS Sustained Low-Low Reactor Vessel Water Level Time Delay) once per Operating Cycle. Therefore, this change provides greater clarity and detail but does not alter the current requirements for periodic calibration of Trip System Logic time delay relays and timers, and is considered administrative.

A.12 For the High Pressure Coolant Injection (HPCI) System instrumentation, CTS Table 4.2.1 includes a requirement to perform a calibration of Trip System Logic once per Operating Cycle. This requirement is modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." The HPCI System instrumentation does not include any time delay relays or timers necessary for proper functioning of the trip system. Therefore, this Note is unnecessary and is deleted in proposed Table 4.2.1, since the HPCI System instrumentation does not include calibration requirements for time delay relays or timers. As a result, this change removes non-applicable detail, and is considered administrative.

A.13 CTS Table 4.2 Note 4 provides requirements that apply to control rod block and recirculation pump trip instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The recirculation pump trip instrumentation requirements are being moved to proposed Specifications 3.2.I and 4.2.I. The requirements of CTS Table 4.2 Note 4 are physically moved and changes are addressed in proposed Specifications 3.2.E/4.2.E and 3.2.I/4.2.I. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. (See TS 3.2.E/4.2.E DOC A.8 and TS 3.2.I/4.2.I DOC A.9 for final disposition of CTS Table 4.2 Note 4.)

A.14 (not used)

A.15 CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.16 CTS Table 4.2 Note 10 provides requirements that apply to degraded grid protective system instrumentation. The degraded grid protective system instrumentation is located in proposed Specifications 3.2.K and 4.2.K. The requirements of CTS Table 4.2 Note 10 are physically moved and changes are addressed in proposed Specifications 3.2.K and 4.2.K. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.17 CTS Table 4.2 Notes 12 and 13 provides requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 12 and 13 are physically moved and changes are addressed in proposed Specifications 3.2.E and 4.2.E. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.18 CTS Table 4.2.1 includes a separate Trip System Logic listing for each ECCS subsystem with a requirement for performance of Functional Tests once per Operating Cycle. Trip System Logics are considered part of the ECCS Instrumentation Trip Functions as stated in DOC L.5, and the VYNPS TS definition of Logic System Functional Test (LSFT), Definition 1.0.H, provides the required details for performance of an LSFT to verify operability of the logic circuits for these functions. Proposed Surveillance Requirement 4.2.A.2 requires a Logic System Functional Test (LSFT) of the ECCS Instrumentation Trip Functions once every Operating Cycle. The details in CTS Table 4.2.1 are redundant to proposed Surveillance Requirement 4.2.A.2 and are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Therefore, the CTS Table 4.2.1 listings of Trip System Logics as separate Trip Functions are unnecessary and are deleted. Not including these details in TS is consistent with the ISTS, and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.2.1 Note 9 provides an allowance to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances regardless of whether ECCS initiation capability is maintained. This note is applied to the Core Spray Pump Start Time Delay, the Low Pressure Coolant Injection (LPCI) Reactor Vessel Shroud Level and the LPCI Pump Start Time Delay Trip Functions of Table 3.2.1. In proposed SR 4.2.A.1, for these Trip Functions, the allowance to delay entry into actions for 6 hours is revised to require that the allowance only be used when the redundant Trip Function maintains ECCS initiation capability. This represents an additional restriction on plant operation necessary to maintain consistency with the basis for the 6 hour allowance, i.e., NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988. This change is consistent with the ISTS, LCO 3.3.5.1, Surveillance Requirements Table, Note 2.

M.2 CTS Table 3.2.1 Note 10 provides actions for inoperable channels for Core Spray and LPCI. These actions allow the inoperable channel to be tripped within 24 hours, rather than requiring the channel to be restored to operable status. Note 10 is applied to the Core Spray Auxiliary Power Monitor (LNPX C/D), Core Spray Pump Bus Power Monitor (27/3A/B, 27/4A/B), the LPCI Auxiliary Power Monitor (LNPX C/D), and the LPCI Pump Bus Power Monitor (27/3A/B, 27/4A/B). These Power Monitor Trip Functions act as permissives for the Core Spray and LPCI Pump Start Delay Functions. As such, placing these Power Monitor Trip Function channels in trip (as allowed by Note 10.B) does not necessarily result in a safe state for the channel in all events and could result in overloading the diesel generators during load sequencing. Therefore, the actions for inoperable channels of these Power Monitor Trip Functions are revised, in proposed Table 3.2.1 Action Note 2, to require that they be restored to operable status within 24 hours rather than being placed in trip. This change represents an additional restriction on plant operation. Although ISTS Table 3.3.5.1-1 does not include Bus Power Monitor Trip Functions, this change is consistent with that Table for comparable permissives and with LCO 3.3.5.1 Action Note C.2 (i.e., inoperable permissives are required to be restored to operable status within 24 hours rather than being placed in trip).

M.3 CTS Table 3.2.1 Note 12 provides actions for inoperable actuation timer channels for Core Spray and LPCI. These actions allow the inoperable channel to be tripped within 24 hours, rather than requiring it to be restored to operable status. The subject channels are associated with Time Delay Trip Functions. As such, placing these Time Delay Trip Functions channels in trip (as allowed by Note 12.B) does not permit performance of the intended function (providing a time delay for actuation after certain conditions are satisfied) and could adversely impact the capability of these safety systems to perform their intended functions. Therefore, the actions for inoperable channels of these Time Delay Trip Functions are revised, in proposed Table 3.2.1 Action Note 2, to require that they be restored to operable status within 24 hours rather than being placed in trip. This change represents an additional restriction on plant operation. Although ISTS Table 3.3.5.1-1 includes only one of the two Core Spray and LPCI time delay functions identified in proposed Table 3.2.1 (LPCI Pump Start Time Delay), the change is consistent with LCO 3.3.5.1 Action Note C for that function (i.e., the inoperable time delay is required to be restored to operable status within 24 hours rather than being placed in trip) and is therefore also consistent for the Core Spray time delay function.

M.4 Deleted.

M.5 CTS Table 4.2.1 does not include explicit requirements to calibrate trip units. Proposed Table 4.2.1 requires calibration of the trip units of the following Trip Functions every 3 months: Core Spray High Drywell Pressure (proposed Table 4.2.1 Trip Function 1.a); Core Spray Low-Low Reactor Vessel Water Level (proposed Table 4.2.1 Trip Function 1.b); Core Spray Low Reactor Pressure (proposed Table 4.2.1 Trip Functions 1.c and 1.d); LPCI Low Reactor Pressure (proposed Table 4.2.1 Trip Functions 2.a and 2 h); LPCI High Drywell Pressure (proposed Table 4.2.1 Trip Functions 2.b and 2.g); LPCI Low-Low Reactor Vessel Water Level (proposed Table 4.2.1 Trip Function 2.c); LPCI Reactor Vessel Shroud Level (proposed Table 4.2.1 Trip Function 2.d); HPCI Low-Low Reactor Vessel Water Level (proposed Table 4.2.1 Trip Function 3.a); HPCI High Drywell Pressure (proposed Table 4.2.1 Trip Function 3.c); HPCI High Reactor Vessel Water Level (proposed Table 4.2.1 Trip Function 3.d); ADS Low-Low Reactor Vessel Water Level (proposed Table 4.2.1 Trip Function 4.a); and ADS High Drywell Pressure (proposed Table 4.2.1 Trip Function 4.b). The trip units of these Trip Functions are currently required by CTS Table 4.2.1 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. This change is consistent with the ISTS, LCO 3.3.5.1, SR 3.3.5.1.3.

M.6 CTS Table 3.2.1 specifies for the Low Condensate Storage Tank Water Level Trip Function that the Trip Setting be > 3%. The function of the Low Condensate Storage Tank Water Level is to provide an automatic transfer of the HPCI suction source from the condensate storage tank to the suppression pool when the level in the condensate storage tank is no longer sufficient to support adequate HPCI pump suction head. The CTS Trip Setting has been determined to be insufficient to ensure that transfer of the HPCI System suction from the condensate storage tank to the suppression pool occurs prior to potential vortex formation at the HPCI suction inlet in the condensate storage tank. Therefore, in proposed Table 3.2.1, the Trip Setting for the Low Condensate Storage Tank Water Level Trip Function (Trip Function 3.b) has been increased to > 4.24% to account for the additional water level needed to preclude the potential for vortex formation. This minimum level corresponds to the Process Limit used in the associated setpoint calculation. To account for instrument uncertainties, the instrument setpoint and as-found tolerance (i.e., instrument operability limit) were developed using the Vermont Yankee Instrument Uncertainty and Setpoints Design Guide. Footnote (d) in proposed Table 3.2.1 clarifies that the trip setting is specified in terms of percent instrument span. The instrument setpoint and as-found tolerance are located in plant procedures. This change represents an additional restriction on plant operation necessary to ensure that HPCI System operability is maintained when aligned to the condensate storage tank and that HPCI pump suction transfer to the suppression pool occurs prior to the vortex formation. This change is consistent with ISTS, Table 3.3.5.1-1, Trip Function 3.d, and with the LCO 3.3.5.1 Bases statements regarding Allowable Value.

M.7 CTS Table 3.2.1 requires 2 channels per trip system for Core Spray Pump Discharge Pressure (proposed Trip Function 1.f). As described in the proposed Bases, the two Core Spray Pump A discharge pressure channels feed ADS trip system A, and the two Core Spray Pump B discharge pressure channels feed ADS trip system B. Therefore, in order to provide redundancy, both channels for each pump must be operable. The number of required channels per trip system for Trip Function 1.f is being changed from "2" to "2 per pump." This matches the current requirement for LPCI Pump Discharge Pressure (proposed Trip Function 2.f). This change is consistent the ISTS, LCO 3.3.5.1 Bases for Table 3.3.5.1-1 Trip Function 5.e, which requires two operable channels for the associated Core Spray pump for each of the two ADS trip systems.

<u>TECHNICAL CHANGES - LESS RESTRICTIVE</u>

"Generic"

LA.1 The CTS Tables 3.2.1 and 4.2.1 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.A and Table 3.2.1 require the ECCS Instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.1 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required ECCS Instrumentation Trip Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 CTS Table 3.2.1 and associated Note 1 contain design and operational details of the ECCS and RPT instrumentation (i.e., nomenclature for each of the subsystems, that each of the two Core Spray, LPCI and RPT, subsystems are initiated and controlled by a trip system, and that subsystem "B is identical to subsystem "A"). These details are not necessary to ensure the operability of ECCS and RPT instrumentation. Therefore, the information in this note is to be relocated to Specifications 3.2.A and 3.2.I Bases, as applicable, and reference to this information is deleted from VYNPS TS. The requirements of Specifications 3.2.A and 3.2.I and the associated Surveillance Requirements for the ECCS and RPT instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 The Trip Settings associated with reactor vessel water level trip functions (proposed Table 3.2.1 Trip Functions 1.b, 2.c, and 3.d) are currently referenced to "above the top of enriched fuel." This detail is to be relocated to the Bases. This reference is not necessary to be included in the VYNPS TS to ensure the operability of the associated ECCS instrumentation. Operability requirements are adequately addressed in proposed Specification 3.2.A, Table 3.2.1 and the specified Trip Settings. As such, this relocated reference is not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.4 CTS Table 3.2.1 Notes 3, 4, 7, and the first sentence of Note 6, contain design details of the ECCS instrumentation (i.e., one trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic, one trip system with initiating instrumentation arranged in a one-out-of-two logic, one trip system arranged in a two-out-of-two logic, and any one of the two trip systems will initiate ADS). These details are not necessary to ensure the operability of ECCS instrumentation. Therefore, the information in these notes is to be relocated to Specification 3.2.A Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.A and the associated Surveillance Requirements for the ECCS instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.5 CTS Table 4.2.1 and associated Notes 2 and 11 describe details of the performance of the Functional Test of the ADS Trip System Logic. These details are to be relocated to Bases. These details are not necessary to ensure the operability of the ADS Trip System Logic instrumentation. The VYNPS TS definition of Logic System Functional Tests, the requirements of proposed Specification 3.2.A, and the associated Surveillance Requirements (including the requirements to periodically perform Logic System Functional Tests) are adequate to ensure the ADS Trip System Logic is maintained operable. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 Discussion of Change

CTS 3.2.A requires the Core Spray and LPCI High Drywell Pressure Trip Functions (proposed Table 3.2.1 Trip Functions 1.a, 2.b, and 2.g) to be operable whenever the Core Spray and LPCI subsystems are required to be operable. Per CTS 3.5.A, Core Spray and LPCI are required to be operable whenever irradiated fuel is in the reactor vessel. In addition, CTS 3.5.H specifies limited operability requirements for shutdown conditions. The result is that Core Spray and LPCI are currently required to be operable whenever irradiated fuel is in the reactor vessel in Run, Startup/Hot Standby, and Hot Shutdown, and in Cold Shutdown and Refuel when operations with a potential for draining the reactor vessel (OPDRVs) are in progress. Proposed Table 3.2.1 only requires these Trip Functions to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212°F, regardless of whether or not OPDRVs are in progress. This change is consistent with the ISTS, LCO 3.3.5.1, Table 3.3.5.1, Trip Function 1.b and LCO 3.5.2, Mode 5 Applicability.

Justification

This change is acceptable for the following reasons. The Core Spray and LPCI High Drywell Pressure Trip Functions (proposed Table 3.2.1 Trip Functions 1.a, 2.b, and 2.g) are not required to be operable in Cold Shutdown and Refuel with reactor coolant temperature ≤ 212°F since the primary containment is not required to be operable and there is insufficient energy in the reactor to pressurize the primary containment to the High Drywell pressure setpoint. In these conditions, other Core Spray and LPCI Trip Functions identified in proposed Table 3.2.1 for this Mode of Applicability, as modified by Footnote (b), are required to be operable to generate an ECCS initiation signal if required.

L.2 Discussion of Change

CTS Table 3.2.1, Notes 10.A, 11.A, 12.A, 17.A, and 18.A require that associated systems be declared inoperable within 1 hour of discovery of loss of initiation capability for feature(s) in one division or one trip system (as applicable) when ECCS instrumentation channels are inoperable. Proposed Table 3.2.1 Action Notes 1.a, 2.a, 7.a, and 8.a are revised to require that associated systems be declared inoperable within 1 hour of discovery of loss of initiation capability for feature(s) in both divisions or two trip systems (as applicable) when ECCS instrumentation channels are inoperable. This change is consistent with the ISTS, LCO 3.3.5.1, Action Notes B, C, F, G and Table 3.3.5.1-1, associated Trip Functions.

Justification

These Notes were intended to provide requirements to ensure that a complete loss of function does not exist (for more than 1 hour) due to more than one instrument channel of an individual Trip Function being inoperable. However, the subject action requirements were written to require the implementation of the more restrictive allowed outage times associated with a loss of function (i.e., 1 hour) even for conditions for which safety function was maintained. As an example, for a Trip Function with two trip systems each providing actuation signals to two divisions, if one trip system for one division of equipment is inoperable, the remaining trip system is capable of actuating the second division of redundant equipment. Therefore, a complete loss of function has not occurred and it is not appropriate to apply the more restrictive loss of function allowed outage time of 1 hour for this condition. Consistent with the intent of these "loss of function" requirements, proposed Table 3.2.1 Action Notes 1.a, 2.a, 7.a, and 8.a are revised to require that associated systems be declared inoperable within 1 hour of discovery of loss of initiation capability for feature(s) in both divisions or two trip systems (as applicable) when ECCS instrumentation channels are inoperable. This change is acceptable, since if sufficient instrument channels are operable or in trip such that a loss of function has not occurred, the allowed outage times of proposed Table 3.2.1 Action Notes 1.b, 2.b, 7.a and b, and 8.a and b, will limit operation in this condition to within the bounds of the applicable analysis, i.e., GE Topical Report NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.

L.3 Discussion of Change

CTS Table 3.2.1 Note 13.A requires that associated systems be declared inoperable within 1 hour of discovery of loss of LPCI System initiation capability when LPCI Reactor Vessel Shroud Level Trip Function instrumentation channels are inoperable. Proposed Table 3.2.1 Action Note 3.a does not apply this "loss of LPCI initiation capability" requirement to the LPCI Reactor Vessel Shroud Level Trip Function (proposed Table 3.2.1 Trip Function 2.d). As such, a total loss of LPCI Reactor Vessel Shroud Level Trip Function capability for 24 hours (proposed Table 3.2.1 Action Note 3.b) is allowed. This change is consistent with the ISTS, LCO 3.3.5.1, Action Note B, and Table 3.3.5.1-1, Trip Function 2.e.

Justification

This change is acceptable for the following reasons. The LPCI Reactor Vessel Shroud Level Trip Function is provided as a permissive to allow the RHR System to be manually aligned from the LPCI mode to the suppression pool cooling/spray or drywell spray modes. The permissive ensures that water level in the vessel is at least two thirds core height before the manual transfer is allowed. The LPCI Reactor Vessel Shroud Level Trip Function only serves as a backup to administrative controls to ensure operators do not divert LPCI flow from injecting into the core when needed. Therefore, a total loss of LPCI Reactor Vessel Shroud Level Trip Function capability is allowed for 24 hours since the LPCI subsystems remain capable of performing their intended safety function. This Trip Function may be overridden during accident conditions as allowed by plant procedures. Therefore, with a total loss of LPCI Reactor Vessel Shroud Level Trip Function capability the LPCI subsystems remain capable of performing their intended safety function.

L.4 Discussion of Change

CTS 3.2.A requires the LPCI Reactor Vessel Shroud Level Trip Function to be operable whenever the LPCI subsystems are required to be operable. Per CTS 3.5.A, LPCI is required to be operable whenever irradiated fuel is in the reactor vessel, with exceptions for shutdown conditions specified in CTS 3.5.H. The result is that LPCI is currently required to be operable whenever irradiated fuel is in the reactor vessel in Run, Startup/Hot Standby, and Hot Shutdown, and in Cold Shutdown and Refuel when operations with a potential for draining the reactor vessel (OPDRVs) are in progress. Proposed Table 3.2.1 only requires this Trip Function (Trip Function 2.d) to be operable in Run, Startup/Hot Standby, Hot Shutdown and Refuel with reactor coolant temperature > 212°F, regardless of whether or not OPDRVs are in progress. This change is consistent with the ISTS, Table 3.3.5.1-1, Trip Function 2.e and LCO 3.5.2, Mode 5 Applicability.

Justification

This change is acceptable for the following reasons. The LPCI Reactor Vessel Shroud Level Trip Function is provided as a permissive to allow the RHR System to be manually aligned from the LPCI mode to the suppression pool cooling/spray or drywell spray modes. The permissive ensures that water level in the vessel is at least two thirds core height before the manual transfer is allowed. In Cold Shutdown and Refuel with reactor coolant temperature ≤ 212°F, the specific initiation time of the ECCS is not assumed and other administrative controls are adequate to ensure operators do not divert LPCI flow since the modes of the RHR System (drywell and suppression pool spray) that utilize this Trip Function are not required to be operable and are normally not used.

L.5 Discussion of Change

CTS Table 3.2.1 includes requirements for Trip System Logics associated with the ECCS instrumentation Trip Functions. The CTS Table 3.2.1 listing of Trip System Logics as separate Trip Functions is deleted. This change is consistent with the ISTS, Table 3.3.5.1-1.

Justification

Trip Systems Logics are the circuits that operate to cause a protective action to occur upon actuation of one or more instrument channel trip signals. Trip System Logics are considered part of the ECCS instrumentation Trip Functions and the requirements for these associated Trip System Logics to be operable are encompassed by the definition of operable. Therefore, the CTS Table 3.2.1 listing of Trip System Logics as separate Trip Functions is unnecessary and is deleted. With the deletion of separate Trip System Logic Trip Functions, the actions associated with inoperable Trip System Logic (CTS Table 3.2.1 Notes 5 and 6) will now be governed by the actions for the individual proposed Table 3.2.1 ECCS instrumentation Trip Functions, and the CTS Notes are being deleted as unnecessary. The proposed Table 3.2.1 Action Notes are less restrictive than the CTS Table 3.2.1 Notes 5 and 6 actions. However, the proposed actions will ensure, in the event of inoperabilities, that consistent actions are applied to both ECCS instrumentation Trip Functions and their associated Trip System Logics for the same level of degradation. In addition, DOC A.3 adds SR 4.2.A.2 which specifically requires performance of a Logic System Functional Test. This requirement will ensure that all portions of the ECCS logic systems are demonstrated to be operable. This change is acceptable, since the allowed outage times of the proposed Table 3.2.1 Action Notes will limit operation to within the bounds of the applicable analysis, i.e., GE Topical Report NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988. Application of these analyses to the VYNPS ECCS instrumentation Trip Functions, including the associated Trip System Logics, was approved by the NRC in VYNPS License Amendment No. 186 dated April 3, 2000.

RELOCATED SPECIFICATIONS

R.1 The CTS Table 3.2.1 LPCI Time Delay (10A-K72A & B) Trip Function and associated requirements are to be relocated.

Discussion:

The function of the subject LPCI Time Delay Trip Function is to preclude the Residual Heat Removal Heat Exchanger (RHR) Bypass Valve from being manually closed during a LOCA until a specified amount of time has passed. This ensures that the maximum amount of LPCI flow reaches the reactor vessel during a LOCA. While this instrumentation provides added assurance of LPCI flow under certain conditions, it is not assumed to mitigate any design basis accident (DBA) or transient. In addition, there are many other instances where the operator must reduce or secure LPCI flow, and may do so by other means that are not interlocked (e.g., securing the RHR pump). The CTS requirements for the LPCI Time Delay Trip Function associated with the RHR Bypass Valve Time Delay do not meet any of the Technical Specification criteria of 10CFR50.36(c)(2)(ii) as described below and are to be relocated the Technical Requirements Manual (TRM). Changes to the TRM are controlled by the provisions of 10 CFR 50.59.

Comparison to Screening Criteria:

1. The LPCI Time Delay Trip Function associated with the RHR Bypass Valve Time Delay is not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The LPCI Time Delay Trip Function associated with the RHR Bypass Valve Time Delay is not a process variable that is an initial condition of a DBA or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

3. The LPCI Time Delay Trip Function associated with the RHR Bypass Valve Time Delay is not part of the primary success path that functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

4. The LPCI Time Delay Trip Function associated with the RHR Bypass Valve Time Delay was found to be a non-significant risk contributor to core damage frequency and offsite releases.

Conclusion:

Since the Technical Specification criteria have not been satisfied, the ECCS Instrumentation LCO and Surveillances associated with the LPCI Time Delay Trip Function for the RHR Bypass Valve Time Delay may be relocated to other plant controlled documents outside the Technical Specifications (a Technical Requirements Manual).

R.2 The CTS Table 3.2.1 LPCI Time Delay (10A-K45A & B) Trip Function and associated requirements are to be relocated.

Discussion:

The function of the subject LPCI Time Delay Trip Function is to ensure that the outboard LPCI injection valves are fully opened to ensure full flow to the reactor vessel, prior to allowing the operator to manually divert full flow for other post-accident purposes. While this instrumentation provides added assurance of full LPCI flow to the reactor vessel under certain conditions, these instruments are not credited in any DBA or transient. The CTS requirements for the LPCI Time Delay Trip Function associated with the LPCI Outboard Injection Valve Time Delay do not meet any of the Technical Specification criteria of 10CFR50.36(c)(2)(ii) as described below and are to be relocated the Technical Requirements Manual (TRM). Changes to the TRM are controlled by the provisions of 10 CFR 50.59.

Comparison to Screening Criteria:

1. The LPCI Time Delay Trip Function associated with the LPCI Outboard Injection Valve Time Delay is not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The LPCI Time Delay Trip Function associated with the LPCI Outboard Injection Valve Time Delay is not a process variable that is an initial condition of a DBA or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

3. The LPCI Time Delay Trip Function associated with the LPCI Outboard Injection Valve Time Delay is not part of the primary success path that functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

4. The LPCI Time Delay Trip Function associated with the LPCI Outboard Injection Valve Time Delay was found to be a non-significant risk contributor to core damage frequency and offsite releases.

Conclusion:

Since the Technical Specification criteria have not been satisfied, the ECCS Instrumentation LCO and Surveillances associated with the LPCI Time Delay Trip Function for the LPCI Outboard Injection Valve Time Delay may be relocated to other plant controlled documents outside the Technical Specifications (a Technical Requirements Manual).

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Tab 4.C

Primary Containment Isolation

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.B/4.2.B, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 34 – Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.A/4.2.A and 3.2.C/4.2.C to their own separate set of pages.

- Table 3.2.1, pages 39 and 40 – Title changed to "Table 3.2.2" to reflect separation from original Table 3.2.1 as part of relocation under TS 3.2.B/4.2.B, column headings changed to match ISTS style, trip function line items given specific sequential numbering and columns repositioned for clarity and consistency.

- Table 3.2.1 Notes, page 44 - Header changed to read "ACTION Notes," Notes renumbered to adjust for deletions, and new Action Notes 1.a, 1.b, 2.a, 2.b, 2.c and 2.d rewritten for clarity.

- Table 3.2.2, page 45 - Column headings changed to match ISTS style, trip function line items given specific sequential numbering, and columns repositioned for clarity and consistency.

- Table 3.2.2, page 46 - Column headings changed to match ISTS style, trip function line items given specific sequential numbering, Trip Functions 3.d and 3.e modified for accuracy, ACTION Notes renumbered to agree with new Notes page and columns repositioned for clarity and consistency .

- Table 3.2.2, page 47 - Column headings changed to match ISTS style, trip function line items given specific sequential numbering, wording of Trip Functions 4.a, 4.b and 4.e modified for accuracy and columns repositioned for clarity and consistency.

- Table 3.2.2 Notes, pages 48 and 48a - Header changed to read "ACTION Notes," "Deleted" wording removed where previously eliminated Notes were located, Notes renumbered to adjust for deletions and new Action Notes rewritten for clarity.

- Table 4.2.2, pages 60 and 64 through 66 – Titles modified for accuracy, Trip Function line items given specific sequential numbering, columns repositioned to place most frequent activity (Check) first and blank entries currently shown as "--" changed to "NA".

- Table 4.2 Notes, page 74 – "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.9, A.21, A.22 and LA.8.)

A.2 CTS 3.2.B specifies an Applicability for primary containment isolation instrumentation of "When primary containment is required, in accordance with Specification 3.7" CTS Table 3.2.2 Note 12 specifies an Applicability of "Whenever Primary Containment integrity is required by Specification 3.7.A.2." CTS Table 3.2.2 Note 13 specifies an Applicability of "Whenever the High Pressure Cooling Injection System and Reactor Core Isolation Cooling System are required to be operable in accordance with Specification 3.5" for the High Pressure Coolant Injection (HPCI) System and Reactor Core Isolation Cooling (RCIC) System Low Steam Supply Pressure Trip Functions. Specification 3.5 provides requirements for the HPCI and RCIC Systems. Specification 3.7 includes the requirements for the primary containment. This change provides an explicit Applicability, in proposed Table 3.2.2, for each primary containment isolation instrumentation trip function, and associated ACTION statements via reference to proposed Table 3.2.2 ACTION Note 1 (which was relocated from CTS Table 3.2.2 Notes 12 and 13 and CTS Table 3.2.1 Note 10, and aggregated/rewritten for clarity), Notes 2.a through 2.d (addressed in DOC M.1, M.3, M.4, LA.4, L.3 and L.5 below) and Footnotes (a), (b) and (c). The specified Applicabilities in proposed Table 3.2.2 are consistent with the Modes and conditions when primary containment integrity is required to be operable by Specification 3.7, and, for the HPCI System and RCIC System Low Steam Supply Pressure Trip Functions, when HPCI and RCIC are required to be operable by Specification 3.5; except as provided and justified in DOC L.1 below. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.3 CTS 4.2.B specifies that instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.2. In proposed Surveillance Requirement (SR) 4.2.B.1, the reference to "and logic systems," is deleted since associated logic systems are considered part of the Primary Containment Isolation instrumentation Trip Functions as stated in DOC L.4. It is not necessary to explicitly identify logic systems in proposed SR 4.2.B.1 since proposed SR 4.2.B.2 (relocated CTS Table 4.2.2 requirements to perform Functional Tests of Trip System Logic) continues to require performance of surveillance testing of Trip System Logic (i.e., performance of Logic System Functional Tests for each Primary Containment Isolation instrumentation Trip Function). Therefore, this change is considered administrative.

A.4 CTS 4.2.B includes reference to CTS Table 4.2.2 for functional test and calibration requirements for primary containment isolation instrumentation. CTS 4.2.B is revised, in proposed SR 4.2.B.1, to also include reference to check requirements consistent with CTS Table 4.2.2. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain primary containment isolation instrument trip functions. Therefore, this change is considered administrative in nature.

A.5 CTS Table 3.2.1, Note 9 and CTS Table 3.2.2 Note 11, provide allowances to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances. These allowances are moved to proposed SR 4.2.B.1

and the allowances of these two notes are combined. This change does not involve a technical change, but is only a difference in presentation . Therefore, this change is considered administrative.

A.6 CTS Tables 3.2.1 and 4.2.1 include a Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B). The purpose of this trip function is to provide isolation of the shutdown cooling portion of the Residual Heat Removal (RHR) System to protect that system from overpressurization due to high reactor pressure. This isolation provides for equipment protection to prevent an intersystem LOCA scenario. As a result, the name of this trip function is revised to "Residual Heat Removal Shutdown Cooling Isolation - High Reactor Pressure" in proposed Tables 3.2.2 and 4.2.2 to more accurately reflect its function. The design and operation of the actual instrumentation is unchanged. Therefore, this change is considered administrative.

A.7 CTS Tables 3.2.1 and 4.2.1 include requirements for the Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B) and associated Trip System Logic. The purpose of this Trip Function and associated Trip System Logic is to provide isolation of the shutdown cooling portion of the Residual Heat Removal (RHR) System to protect that system from overpressurization due to high reactor pressure. This isolation provides for equipment protection to prevent an intersystem LOCA scenario. These requirements are to be moved to the primary containment isolation instrumentation TS. Given the isolation function of this Trip Function and associated Trip System Logic, they are more appropriately located in proposed Tables 3.2.2 and 4.2.2. As a corresponding change, the reference to initiation capability in CTS Table 3.2.1 Note 10 (proposed Table 3.2.2 Action Note 1, as aggregated and rewritten for clarity per DOC A.1) is editorially changed to isolation capability. This change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, including the requirements this Trip Function and associated Trip System Logic in the primary containment isolation instrumentation TS, is consistent with the ISTS.

A.8 Notes 10 and 5 to CTS Table 3.2.1 provide actions when the minimum number of channels per trip system requirement is not met. These requirements are divided and identified in two separate columns in proposed Table 3.2.2 titled, "ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE" and "ACTIONS REFERENCED FROM ACTION NOTE 1." This change is a difference in presentation only and does not alter the current action requirements when the required channels are inoperable. Therefore, this change is considered administrative in nature.

A.9 CTS Tables 3.2.1 and 4.2.1 and associated Notes provide requirements related to Recirculation Pump Trip instrumentation. The requirements applicable to the Recirculation Pump Trip instrumentation are physically moved and changes are addressed in proposed Specifications 3.2.I and 4.2.I. CTS Tables 3.2.1 and 4.2.1 and associated Notes also provide requirements for ECCS Instrumentation. The ECCS instrumentation requirements are included in proposed Tables 3.2.1 and 4.2.1. Changes to the ECCS instrumentation requirements are addressed in the safety assessment of changes for TS 3.2.A/4.2.A, ECCS Instrumentation. CTS Table 4.2 Notes 4, 12, and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 4, 12, and 13 are physically moved and changes are addressed in proposed Specifications 3.2.E and 4.2.E. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. CTS Table 4.2 Note 10 provides requirements that apply to degraded grid protective system instrumentation. The degraded grid protective system instrumentation is located in proposed Specifications 3.2.K and 4.2.K. The requirements of CTS Table 4.2 Note 10 are physically moved and changes are addressed in proposed Specification 3.2.K and 4.2.K. CTS Table 4.2 Note 11 provides requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Note 11 are physically moved and changes are addressed in proposed Specification 3.2.A and 4.2.A. These changes do not involve technical changes, but are only differences in presentation and are considered administrative.

A.10 The Primary Containment Isolation Instrumentation portion of CTS Tables 3.2.2 and 4.2.2 is divided into two sections, Main Steam Line Isolation (Trip Function 1), and Primary Containment Isolation (Trip Function 2) in proposed Tables 3.2.2 and 4.2.2. The appropriate individual trip functions are placed with the proper isolation. Since the current requirements are maintained (except as addressed in DOC M.1 through M.7 and L.1 through L.5 below), the change is considered to be administrative in nature. This change is consistent with the ISTS.

A.11 Note 12 to CTS Table 3.2.2 provides actions when the minimum number of channels per trip system requirement is not met. These requirements are identified in a separate column in proposed Table 3.2.2 titled, "ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE." This change is a difference in presentation only and does not alter the current action requirements when required primary containment isolation instrumentation channels are inoperable. Therefore, this change is considered administrative in nature.

A.12 The name of the CTS Table 3.2.2 High Main Steam Line Flow Trip Function (DPT-2-116A, 117B, 118C, 119D (S1)) is revised to reflect the condition when this trip function is available. This trip function is available only in the Refuel, Shutdown, and Startup Modes (i.e., not available in Run). Therefore, the name of proposed Tables 3.2.2 and 4.2.2 Trip Function 1.e is "High Main Steam Line Flow – Not in RUN." The design and operation of the actual instrumentation is unchanged. Therefore, this change is considered administrative.

A.13 CTS 3.2.B requires that the instrumentation in CTS Table 3.2.2 be operable when primary containment integrity is required in accordance with Specification 3.7. CTS 3.7 requires primary containment integrity when reactor water temperature is above 212°F and fuel is in the reactor vessel. The Primary Containment Isolation Instrumentation Low Main Steam Line Pressure Trip Function requirements of CTS Table 3.2.2 are modified by CTS Table 3.2.2 Note 1. CTS Table 3.2.2 Note 1 states that the main steam line low pressure need be available only in the Run Mode. The intent of this note is to waive the operability requirements of the Primary Containment Isolation Instrumentation Low Main Steam Line Pressure Trip Function when the reactor is not in the Run Mode. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.2 requires the Low Main Steam Line Pressure Trip Function (proposed Table 3.2.2, Trip Function 1.d) to be operable in the

Run Mode which is equivalent to CTS requirements. As such, this change is considered administrative in nature. This change is consistent with the ISTS.

A.14 CTS 3.2.B requires that the instrumentation in CTS Table 3.2.2 be operable when primary containment integrity is required in accordance with Specification 3.7. CTS 3.7 requires primary containment integrity when reactor water temperature is above 212°F and fuel is in the reactor vessel. The Primary Containment Isolation Instrumentation High Main Steam Line Flow Trip Function (DPT-2-116A, 117B, 118C, 119D (S1)) requirements of CTS Table 3.2.2 are modified by CTS Table 3.2.2 Note 6. CTS Table 3.2.2 Note 6 states that the main steam line high flow is available only in the Refuel, Shutdown, and Startup Modes. The intent of this note is to waive the operability requirements of the Primary Containment Isolation Instrumentation High Main Steam Line Flow Trip Function (DPT-2-116A, 117B, 118C, 119D (S1)) when the reactor is in the Run Mode. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.2 requires the High Main Steam Line Flow Trip Function (proposed Table 3.2.2, Trip Function 1.e) to be operable in the Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F) Modes which is equivalent to CTS requirements. As such, this change is considered administrative in nature.

A.15 CTS 3.2.B requires that the instrumentation in CTS Table 3.2.2 be operable when primary containment integrity is required in accordance with Specification 3.7. CTS 3.7 requires primary containment integrity when reactor water temperature is above 212°F and fuel is in the reactor vessel. The Primary Containment Isolation Instrumentation Condenser Low Vacuum Trip Function requirements of CTS Table 3.2.2 are modified by CTS Table 3.2.2 Note 10. CTS Table 3.2.2 Note 10 states "A key lock switch is provided to permit the bypass of this trip function to enable plant startup and shutdown when condenser vacuum is greater than 12 inches Hg absolute provided that both turbine stop and bypass valves are closed." The intent of this note is to waive the operability requirements of the Primary Containment Isolation Instrumentation Condenser Low Vacuum Trip Function when the reactor is not in the Run Mode and all turbine stop and bypass valves are closed. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.2 requires the Condenser Low Vacuum Trip Function (proposed Table 3.2.2, Trip Function 1.f) to be operable in the Run, Startup/Hot Standby (with any turbine stop valve or turbine bypass valve not closed), Hot Shutdown (with any turbine stop valve or turbine bypass valve not closed), and Refuel (with reactor coolant water temperature > 212°F and with any turbine stop valve or turbine bypass valve not closed) Modes which is equivalent to CTS requirements. As such, this change is considered administrative in nature.

A.16 All HPCI System Isolation High Steam Line Space Temperature channels are required to be operable to assure isolation with the worst single failure. CTS Table 3.2.2 requires a minimum of 2 per set of 4 channels per trip system of the HPCI System Isolation High Steam Line Space Temperature Trip Function (proposed Table 3.2.2, Trip Function 3.a) to be operable. There are three locations (i.e., 3 sets), each monitored by one set of 4 channels. As a result, there are a total of 12 channels for this trip function, with 6 channels per trip system. Therefore, the minimum number of channels per trip system required to be operable for this trip function is specified as "6" in proposed Table 3.2.2. Since this change involves no design change but is only a difference in nomenclature and presentation, this change is considered administrative.

A.17 The CTS Table 3.2.2 Note 3 action requirement to "comply with Specification 3.5" is an unnecessary reminder that other Technical Specifications may be affected when isolation valves in the HPCI System or RCIC System are closed. This is essentially a "cross reference" between Technical Specifications that has been determined to be adequately provided through training. Therefore, the deletion is considered to be administrative. This change is consistent with the ISTS.

A.18 CTS Table 3.2.2 Notes 12 and 13 refer to automatic isolation trip functions. However, CTS Table 3.2.2 (proposed Table 3.2.2) includes only automatic isolation trip functions. Manual isolation instrumentation trip functions are not included in the VYNPS CTS. Therefore, it is unnecessary to use the word "automatic" when referring to CTS Table 3.2.2 isolation trip functions in proposed Table 3.2.2 Action Note 1. This change is a difference in presentation only and does not alter the current action requirements when required primary containment isolation instrumentation channels are inoperable. Therefore, this change is considered administrative in nature.

A.19 CTS Table 3.2.2 Note 2 states, in the first paragraph, "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 actions listed below shall be taken..." However, due to the presentation of the Notes in CTS Table 3.2.2, Note 2 actions are only taken after actions associated with CTS Table 3.2.2 Note 12 or 13, as applicable, are taken. Since the CTS Table 3.2.2 Note 12 and 13 actions (proposed Table 3.2.2 ACTION Note 1) already provide the appropriate NRC approved actions for each of the conditions addressed in the first paragraph of CTS Table 3.2.2 Note 2, the first paragraph of CTS Table 3.2.2 Note 2 is unnecessary and is deleted. Since actions when required primary containment isolation instrumentation channels are inoperable will continue to be taken in the same manner and in the same time period, the deletion is considered administrative in nature.

A.20 For the Trip System Logic associated with the Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B), CTS Table 4.2.1 includes a requirement to perform a calibration of Trip System Logic once per Operating Cycle. For the Trip System Logic associated with the Primary Containment Isolation Instrumentation, CTS Table 4.2.2 includes a requirement to perform a calibration of Trip System Logic once per Operating Cycle. These requirements are modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." The Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function instrumentation of CTS 4.2.1 and the Primary Containment Isolation Instrumentation Trip Functions of CTS 4.2.2 do not include any time delay relays or timers necessary for proper functioning of the trip systems. Therefore, this Note is deleted and, in proposed Table 4.2.2, the Residual Heat Removal Shutdown Cooling Isolation instrumentation (proposed Trip Function 5.a), Main Steam Line Isolation instrumentation (proposed Trip Functions 1.a through 1.f) and Primary Containment Isolation instrumentation (proposed Trip Functions 2.a and 2.b) do not include calibration requirements for time delay relays or timers. As a result, this change removes non-applicable detail, and is considered administrative.

A.21 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.22 CTS Table 4.2.2 includes a requirement to perform a calibration of Trip System Logic once per Operating Cycle. This requirement is modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." This requirement is reflected in proposed Table 4.2.2 with explicit requirements to perform calibrations of the required HPCI System Isolation and RCIC System Isolation instrumentation time delay relays and timers (i.e., proposed Table 4.2.2 Trip Function 3.e., HPCI System Isolation – High Main Steam Tunnel Temperature Time Delay, and Trip Function 4.b, RCIC System Isolation – High Main Steam Tunnel Temperature Time Delay) once per Operating Cycle. Therefore, this Note can be deleted. The change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.23 CTS Table 4.2.2 includes a separate Trip System Logic listing for each Primary Containment Isolation sub-system with a requirement for performance of Functional Tests once per Operating Cycle. Trip System Logics are considered part of the Primary Containment Isolation Instrumentation Trip Functions as stated in DOC L.4, and the VYNPS TS definition of Logic System Functional Test (LSFT), Definition 1.0.H, provides the required details for performance of an LSFT to verify operability of the logic circuits for these functions. Proposed Surveillance Requirement (SR) 4.2.B.2 requires a Logic System Functional Test (LSFT) of the Primary Containment Isolation Instrumentation Trip Functions once every Operating Cycle. The details in CTS Table 4.2.2 are redundant to proposed SR 4.2.B.2 and are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Therefore, the CTS Table 4.2.2 listings of Trip System Logics as separate Trip Functions are unnecessary and are deleted. Not including these details in TS is consistent with the ISTS, and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.2.1 includes a Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B). The purpose of this trip function is to provide isolation of the shutdown cooling portion of the Residual Heat Removal (RHR) System to protect that system from overpressurization due to high reactor pressure. (Also see Change A.6 above for the change from "Low" to "High" in this Trip Function description.) This isolation provides for equipment protection to prevent an intersystem LOCA scenario. The associated action for this Trip Function, in the event the instrumentation is inoperable and not restored within the allowed time period, in CTS Table 3.2.1 Note 10, requires that the associated systems be declared inoperable. Continued operation in this condition is then allowed for a limited duration in accordance the associated system TS. However, the TS actions for Low Pressure Coolant Injection System inoperabilities do not require that overpressure protection of the RHR System be provided. Therefore, in the same condition, proposed Table 3.2.2 Action Notes 1.b.1 and 2.d will require, respectively, that the isolation capability be restored and that the associated penetration be isolated within one hour, thus restoring overpressure protection for the RHR System. This change represents an additional restriction on plant operation necessary to provide overpressure protection to prevent an intersystem LOCA scenario. The change is consistent with the ISTS, LCO 3.3.6.1, Table 3.3.6.1-1, Trip Function 6.a.

M.2 CTS Table 3.2.2 provides requirements for the Primary Containment Isolation Instrumentation - High Main Steam Line Area Temperature Trip Function. CTS Table 3.2.2 specifies that, for this trip function, the minimum number of operable instrumentation channels per trip system is 2 of 4 in each of 2 channels. There are 2 trip systems for this trip function, each with 2 channels. As such, the CTS require that only 2 temperature sensor inputs (out of 4) per channel be operable per trip system. Therefore, the total number of temperature sensors required to be operable by CTS Table 3.2.2 is 8 (i.e., 2/channel x 2 channels/trip system x 2 trip systems). The temperature sensor arrangement in the channels is such that each of the 4 sensors in a channel monitors temperature of a different area of the main steam lines. This arrangement, when combined with the CTS allowance for any two sensors in one or more logic channels to be inoperable without affecting compliance with the Limiting Conditions for Operation, results in the possibility for a loss of isolation capability for a leak in a specific main steam line area. Therefore, the required number of operable channels per trip system for the High Main Steam Line Area Temperature Trip Function (proposed Table 3.2.2 Trip Function 1.b) is revised to 8 per trip system (for a total number of temperature sensors required to be operable of 16). This change represents an additional restriction on plant operation to ensure adequate temperature monitoring of the main steam line areas is provided. The change is consistent with the ISTS, LCO 3.3.6.1, Table 3.3.6.1-1, Trip Function 1.e.

M.3 CTS 3.2.B requires that the Primary Containment Isolation Instrumentation High Main Steam Line Area Temperature Trip Function (proposed Table 3.2.2 Trip Function 1.b) and the High Main Steam Line Flow (DPT-2-(116-119) (A-D) (M)) Trip Function (proposed Table 3.2.2 Trip Function 1.c) be operable in Run, Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F) Modes and that the Primary Containment Isolation Instrumentation High Main Steam Line Flow (DPT-2-116A, 117B, 118C, 119D (S1)) Trip Function (proposed Table 3.2.2 Trip Function 1.e) be operable in Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F) Modes. In the event minimum conditions for operation are not satisfied for these trip functions, CTS Table 3.2.2 requires compliance with CTS Table 3.2.2 Note 2.B. CTS Table 3.2.2 Note 2.B requires an orderly load reduction to be initiated and to the have the reactor in Hot Standby within 8 hours. However, this action does not result in satisfying the isolation function of the inoperable instrumentation. Nor does this action result in placing the reactor in a Mode in which the instrumentation is not required to be operable to provide isolation. As a result, CTS would allow continued operation with the isolation function of this instrumentation not maintained. Therefore, proposed Table 3.2.2 Action Note 2.a will require, in the same condition, the associated main steam line to be isolated within 12 hours (which satisfies the isolation function of the inoperable instrumentation) or that the reactor be placed in Hot Shutdown within 12 hours and in Cold Shutdown within the next 12 hours (which places the reactor in a Mode in which the instrumentation is not required to be operable). The time period specified for exiting the Modes of Applicability are consistent with times to reach the same Modes provided in other VYNPS TS. This change represents an additional restriction on plant operation necessary to ensure that either the isolation function of the inoperable instrumentation is satisfied or that the reactor is placed in a Mode in which the instrumentation is not required to function to provide isolation. The change is consistent with the ISTS, LCO 3.3.6.1, Action Note D and Table 3.3.6.1-1, Trip Functions 1.e and 1.c, respectively.

M.4 CTS Table 3.2.2 Note 3 effectively specifies actions to isolate the affected penetration flow path (i.e., close isolation valves in the system) but does not state the time period in which this action is to be completed. Proposed Table 3.2.2 Action Note 2.d provides a one hour time period in which to complete the action of isolating the affected penetration flow. Placing a limitation on the time allowed to complete the associated actions represents an additional restriction on plant operation since the time period allowed to complete the isolation will be controlled through TS. This change is consistent with the ISTS, LCO 3.3.6.1, Action Note F.

M.5 CTS Table 3.2.2 Note 12.B provides actions for inoperable HPCI and RCIC Isolation instrumentation, including time delay channels. These actions allow the inoperable channel to be tripped within 24 hours rather than requiring it be restored to operable status. The subject channels for this change are associated with Time Delay Trip Functions. These systems are not designed to support operation with one time delay channel tripped since placing one of the relays in a tripped condition would cause a HPCI or RCIC system isolation, requiring entry into the 14-day LCO. Consequently, restoration of the inoperable channel is the appropriate action to take. To ensure that Trip Function redundancy is promptly restored, the actions for inoperable channels in these Time Delay Trip Functions (proposed Table 3.2.2 Trip Functions 3.e, HPCI System Isolation – High Main Steam Line Tunnel Temperature Time Delay, 4.b, RCIC System Isolation – High Main Steam Line Tunnel Temperature Time Delay, and 4.e, RCIC System Isolation – High Steam Line d/p Time Delay) are revised, in proposed Table 3.2.2 Action Note 1.a.2, to require that they be restored to operable status within 24 hours rather than being placed in trip. This change represents an additional restriction on plant operation and is consistent with the ISTS, LCO 3.3.6.1 Condition A regarding completion time (i.e., inoperable HPCI and RCIC isolation instrument channels, including time delay channels, are required to be placed in trip within 24 hours); however, the required action will be to restore the inoperable channel.

M.6 CTS Table 4.2.2 does not include explicit requirements to calibrate trip units. Proposed Table 4.2.2 requires calibration of the trip units of the following Trip Functions every 3 months: Main Steam Line Isolation – Low-Low Reactor Vessel Water Level (proposed Table 4.2.2 Trip Function 1.a); Main Steam Line Isolation – High Steam Line Flow (proposed Table 4.2.2 Trip Function 1.c); Main Steam Line Isolation – High Steam Line Flow-Not in Run (proposed Table 4.2.2 Trip Function 1.e); Primary Containment Isolation – Low Reactor Vessel Water Level (proposed Table 4.2.2 Trip Function 2.a); and Primary Containment Isolation – High Drywell Pressure (proposed Table 4.2.2 Trip Function 2.b). The trip units of these Trip Functions are currently required by CTS Table 4.2.2 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. This change is consistent with the ISTS, LCO 3.3.6.1, SR 3.3.6.1.3 and Table 3.3.6.1-1, Trip Functions 1.a, 1.c, 2.a, 2.b.

M.7 CTS Table 3.2.2 specifies for the Primary Containment Isolation High Main Steam Line Area Temperature, the HPCI System Isolation High Steam Line Space Temperature, the HPCI System Isolation Main Steam Line Tunnel Temperature, the RCIC System Isolation Main Steam Line Tunnel Temperature, and the RCIC System High Steam Line Space Temperature Trip Functions that the Trip Settings be < 212°F. The function of these instruments is to provide isolation in the event of breaks in the associated steam lines. The CTS Trip Settings have been determined to be insufficient to ensure isolation occurs as assumed in the high energy line break and Equipment Qualification (EQ) Program analyses. Therefore, in proposed Table 3.2.2, the Trip Setting for the Primary Containment Isolation High Main Steam Line Temperature Area Temperature Trip Function (Trip Function 1.b) has been decreased to < 196°F for channels monitoring outside the steam tunnel and < 200°F for channels monitoring inside the steam tunnel; the Trip Settings for the HPCI System Isolation and RCIC System Isolation High Steam Line Space Temperature Trip Functions (Trip Functions 3.a and 4.c, respectively) have been decreased to < 196°F; and the Trip Settings for the HPCI System Isolation and RCIC System Isolation Main Steam Line Tunnel Temperature Trip Functions (Trip Functions 3.d and 4.a, respectively) have been decreased to < 200°F. These revised Trip Settings are consistent with the assumptions of the high energy line break and EQ Program analyses and correspond to the Analytical Limit used in the associated setpoint calculations. To account for instrument uncertainties, the instrument setpoints and as-found tolerances (i.e., instrument operability limits) were developed using the Vermont Yankee Instrument Uncertainty and Setpoints Design Guide. The instrument setpoints and as-found tolerances are located in plant procedures. This change represents an additional restriction on plant operation necessary to ensure that isolation of the associated steam lines occurs as assumed in analyses. This change is consistent with ISTS, LCO 3.3.6.1 Bases for Table 3.3.6.1-1 Trip Functions 1.e, 3.e and 4.e regarding the ability to detect small breaks.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Tables 3.2.1, 3.2.2 and 4.2.1 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.B and Table 3.2.2 require the Primary Containment Isolation Instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.2 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required Primary Containment Isolation Instrumentation Trip Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 CTS Table 3.2.1 includes requirements for the Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B). The purpose of this trip function is to provide isolation of the shutdown cooling portion of the Residual Heat Removal (RHR) System to protect that system from overpressurization due to high reactor pressure. This isolation provides for equipment protection to prevent an intersystem LOCA scenario. CTS Table 3.2.1 includes Trip Settings of 100 < p < 150 psig. The upper Trip Setting ensures the RHR System is isolated from the Reactor Coolant System prior to being overpressurized due to high reactor pressure. The lower Trip Setting is an operational detail that is not directly related to the operability of the associated instrumentation. This detail is to be relocated to plant procedures. The upper Trip Setting is the required limitation for the parameter and this value is retained in the VYNPS TS. As such, the lower Trip Setting for this trip function is not required to be in TS to provide adequate protection of the public health and safety. Changes to the relocated lower Trip Setting in the plant procedures will be controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 The Trip Setting associated with the Low-Low Reactor Vessel Water Level trip function (proposed Table 3.2.2 Trip Function 1.a) is currently referenced to "above the top of enriched fuel" in CTS Table 3.2.2. This detail is to be relocated to the Bases. This reference is not necessary to be included in the VYNPS TS to ensure the operability of the associated primary containment isolation instrumentation. Operability requirements are adequately addressed in proposed Specification 3.2.B, Table 3.2.2 and the specified Trip Setting. As such, this relocated reference is not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.4 Details of the methods for performing CTS Table 3.2.2 Notes 2.A and 2.B (proposed Table 3.2.2 Action Notes 2.b and 2.c), associated with placing the reactor in Cold Shutdown (i.e., initiating an orderly shutdown) or Hot Standby (i.e., initiating an orderly load reduction), are to be relocated to plant procedures. These details are not necessary to ensure the actions of placing the reactor in Cold Shutdown mode or Hot Standby and exiting the applicable Mode of the associated primary containment isolation instrumentation are accomplished. The requirements of proposed Table 3.2.2 and Table 3.2.2 Action Notes 2.b and 2.c are adequate to ensure this action is accomplished. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the plant procedures are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.5 For the Primary Containment Isolation Instrumentation – Condenser Low Vacuum Trip Function, CTS Table 3.2.2 Note 10 states that "A key lock switch is provided to permit the bypass of this trip function to enable plant startup and shutdown when condenser vacuum is greater than 12 inches Hg absolute provided that both turbine stop and bypass valves are closed." The system design details in CTS Table 3.2.2 Note 10 are to be relocated to the Bases and the reference to this information is deleted from the VYNPS TS. These design details are not necessary to be included in the TS to ensure the operability of the Condenser Low Vacuum Trip Function instrumentation since operability requirements are adequately addressed in proposed Specification 3.2.B and Table 3.2.2. Therefore, these relocated details are not required to be in the TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.6 CTS Table 3.2.2 Note 12 contains design and operational details of the primary containment isolation instrumentation (i.e., there shall be two operable or tripped trip systems for each Trip Function). These details are not necessary to ensure the operability of associated primary containment isolation instrumentation. Therefore, the information in this note regarding trip system design and operational status is to be relocated to Specification 3.2.B Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.B and the associated Surveillance Requirements for the associated primary containment isolation instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.7 CTS Table 3.2.2 Note 5 contains design details of the HPCI System Isolation – Low Steam Supply Pressure Trip Function and RCIC System - Low Steam Supply Pressure Trip Function instrumentation (i.e., one trip system arranged in a one-out-of-two taken twice logic). These details are not necessary to ensure the operability of associated isolation instrumentation. Therefore, the information in these notes is to be relocated to Specification 3.2.B Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.B and the associated Surveillance Requirements for these isolation instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.8 CTS Table 4.2 Note 2 describes details of the performance of the Functional Test of the Trip System Logic associated with the Main Steam Line Isolation Trip Functions. The details of Note 2 are to be relocated to Bases. These details are not necessary to ensure the operability of the associated Trip System Logic instrumentation. The VYNPS TS definition of Logic System Functional Tests, the requirements of proposed Specification 3.2.B, and the associated Surveillance Requirements (including the requirements to periodically perform Logic System Functional Tests in proposed SR 4.2.B.2) are adequate to ensure the associated Trip System Logic is maintained operable. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 <u>Discussion of Change</u>

CTS Tables 3.2.1 and 4.2.1 include requirements for the Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function (PS-2-128A & B) and associated Trip System Logic. (This description was changed to "High Reactor Pressure" in proposed Tables 3.2.2 and 4.2.2 by DOC A.6.) CTS 3.2.A specifies an Applicability for this Trip Function and associated Trip System Logic of "When the system(s) it initiates or controls is required in accordance with Specification 3.5." Per CTS 3.5.A, LPCI is required to be operable whenever irradiated fuel is in the reactor vessel, with exceptions for shutdown conditions specified in CTS 3.5.H. The result is that LPCI is currently required to be operable whenever irradiated fuel is in the reactor vessel in Run, Startup/Hot Standby, and Hot Shutdown, and in Cold Shutdown and Refuel when operations with a potential for draining the reactor vessel (OPDRVs) are in progress. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.2 requires the Residual Heat Removal Shutdown Cooling Isolation Trip Function (i.e., Trip Function 5.a) to be operable in Run, Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F). The requirements of CTS 3.5.A for LPCI operability in Cold Shutdown or Refuel during OPDRVs (i.e., with reactor coolant water temperature ≤

212°F) are deleted. This change is consistent with the ISTS, Table 3.3.6.1-1, Trip Function 6.

Justification

This change is acceptable for the following reasons. The purpose of the Residual Heat Removal Shutdown Cooling Isolation Trip Function and associated Trip System Logic is to provide isolation of the shutdown cooling portion of the Residual Heat Removal (RHR) System to protect that system from overpressurization due to high reactor pressure. This isolation provides for equipment protection to prevent an intersystem LOCA scenario. The Residual Heat Removal Shutdown Cooling Isolation Trip Function (i.e., Trip Function 5.a) is only required to be operable in Modes in which the reactor can be pressurized such that isolation of the RHR System is required to prevent overpressurization. Requirements for the Residual Heat Removal Shutdown Cooling Isolation Trip Function in Cold Shutdown or Refueling (with reactor coolant water temperature $\leq$ 212°F) are not necessary to protect the RHR System from overpressurization due to high reactor pressure.

L.2 Discussion of Change

CTS Table 3.2.1 Note 10.A requires that associated systems be declared inoperable within 1 hour of discovery of loss of initiation capability for feature(s) in one division when Low Pressure Coolant Injection System - Low Reactor Pressure Trip Function channels are inoperable. Proposed Table 3.2.2 Action Note 1.b is revised to require, with isolation capability not maintained, that isolation capability be restored within one hour. This change is consistent with the ISTS, LCO 3.3.6.1, Action Note J and Table 3.3.6.1-1, trip Function 6.

Justification

CTS Table 3.2.1 Note 10.A was intended to provide requirements to ensure that a complete loss of function (in this case, loss of capability to isolate the penetration with at least one isolation valve) does not exist (for more than 1 hour) due to more than one instrument channel of an individual Trip Function being inoperable. However, the subject action requirements were written to require the implementation of the more restrictive allowed outage times associated with a loss of function (i.e., 1 hour) even for conditions for which safety function was maintained. As an example, for a Trip Function with two trip systems each providing isolation signals to two isolation valves in a penetration flow path, if the isolation capability associated with one of the two isolation valves is inoperable, the instrumentation inoperability can be such that the automatic isolation of the penetration by the second isolation valve can still be accomplished by the Trip Function. Therefore, a complete loss of function has not occurred and it is not appropriate to apply the more restrictive loss of function allowed outage time of 1 hour for this condition. This change is acceptable, since if sufficient instrument channels are operable or in trip such that a loss of isolation capability has not occurred, the allowed outage times of proposed Table 3.2.2 Action Note 1.a will limit operation in this condition to within the bounds of the applicable analysis, i.e., GE Topical Report NEDC-31677-P-A, "Technical Specification Improvement Analyses for BWR Isolation Actuation Instrumentation," July 1990.

L.3 Discussion of Change

CTS 3.2.B provides requirements for the Primary Containment Isolation Instrumentation Low-Low Reactor Vessel Water Level Trip Function (proposed Table 3.2.2 Trip Function 1.a) and the Primary Containment Isolation Instrumentation Condenser Low Vacuum Trip Function (proposed Table 3.2.2 Trip Function 1.f). In the event minimum conditions for operation are not satisfied for these trip functions, CTS Table 3.2.2 requires compliance with CTS Table 3.2.2 Note 2.A. CTS Table 3.2.2 Note 2.A requires an orderly load reduction to be initiated and to have the reactor in Cold Shutdown within 24 hours. The function of this instrumentation is to provide main steam line isolation. Therefore, proposed Table 3.2.2 Action Note 2.a will require, in the same condition, the associated main steam line to be isolated within 12 hours (which satisfies the isolation function of the inoperable instrumentation) or that the reactor be placed in Hot Shutdown within 12 hours and in Cold Shutdown within the next 12 hours (which places the reactor in a Mode in which the instrumentation is not required to be operable). Some conditions may affect the isolation logic for only one main steam line. In these cases, it is not necessary to require a shutdown of the unit; rather, isolation of the affected line returns the system to a status where it can perform the remainder of its isolation function, and continued operation is allowed (although it may be at a reduced power level) consistent with the plant specific reload analyses which support operation with one main steam line out of service. The change is consistent with the ISTS, LCO 3.3.6.1, Action Note D and Table 3.3.6.1-1, Trip Functions 1.a, 1.d.

Justification

This change is acceptable for the following reasons. The change associated with allowing isolation of the affected main steam line is considered acceptable since manual isolation of the affected main steam line accomplishes the same action as the actuation instrumentation and operation with a main steam line isolated has been analyzed and shown to be acceptable as part of a safety evaluation. The change associated with placing the reactor in Hot Shutdown within 12 hours and in Cold Shutdown within the next 12 hours is acceptable because the total time period specified for exiting the Modes of Applicability is consistent with the time to reach the same Mode provided in CTS Table 3.2.2 Note 2.A (i.e., 24 hours to Cold Shutdown).

L.4 Discussion of Change

CTS Table 3.2.2 includes requirements for Trip System Logics associated with the isolation instrumentation Trip Functions for Primary Containment, HPCI and RCIC. CTS Table 3.2.1 includes requirements for Trip System Logic associated with LPCI actuation instrumentation. The CTS Table 3.2.2 listing of Trip System Logics as separate Trip Functions is deleted. This change is consistent with the ISTS, Table 3.3.6.1-1. The CTS Table 3.2.1 listing of Trip System Logic as a separate Trip Function was already deleted by DOC L.5 in the TS 3.2.A/4.2.A Safety Assessment of Changes.

Justification

Trip Systems Logics are the circuits that operate to cause a protective action to occur upon actuation of one or more instrument channel trip signals. Trip System Logics are listed as separate isolation instrumentation Trip Functions in CTS Table 3.2.2 and as a separate LPCI actuation instrumentation Trip Function in CTS Table 3.2.1, and the requirements for these Trip System Logics to be operable are encompassed by the definition of operable. Therefore, the CTS Table 3.2.2 listing of Trip System Logics as separate Trip Functions is unnecessary and is deleted. The CTS Table 3.2.1 listing of Trip System Logic as a separate Trip Function and the associated Table 3.2.1 Note 5 were already removed as described by DOC L.5 in the Safety Assessment of Changes for TS 3.2.A/4.2.A; the actions associated with inoperable Trip System Logic (CTS Table 3.2.1 Note 5) will now be governed by the actions for the individual proposed Table 3.2.1 LPCI instrumentation Trip Functions. With the deletion of separate Trip System Logic Trip Functions, the actions associated with inoperable Trip System Logic (CTS Table 3.2.2 Notes 2.A and 3) will now be governed by the actions for the individual proposed Table 3.2.2 isolation instrumentation Trip Functions. These proposed Table 3.2.2 Action Notes are less restrictive than the CTS Table 3.2.2 Notes 2.A and 3 actions. However, the proposed actions will ensure, in the event of inoperabilities, that consistent actions are applied to both primary containment isolation instrumentation Trip Functions and their associated Trip System Logics for the same level of degradation. In addition, DOC A.3 adds SR 4.2.B.2 which specifically requires performance of a Logic System Functional Test. This requirement will ensure that all portions of the affected isolation logic systems are demonstrated to be operable. This change is acceptable, since the allowed outage times of the proposed Table 3.2.2 Action Notes will limit operation to within the bounds of the applicable analysis, i.e., GE Topical Reports NEDC-31677-P-A, "Technical Specifications Improvement Analyses for BWR Isolation Actuation Instrumentation, Part 2," July 1990, and NEDC-30851-P-A Supplement 2, "Technical Specifications Improvement Analyses for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989. Application of these analyses to the VYNPS isolation instrumentation Trip Functions, including the associated Trip System Logics, was approved by the NRC in VYNPS License Amendment No. 186 dated April 3, 2000.

L.5 Discussion of Change

CTS 3.2.B does not allow primary containment penetration flow paths that are isolated as a result of complying with actions in CTS Table 3.2.2 to be unisolated under administrative controls. Proposed Table 3.2.2 Action Notes 1, 2.a and 2.d contain an allowance for intermittently unisolating, under administrative control, primary containment penetrations that were isolated as a result of complying with proposed Table 3.2.2 Action Notes. This change is consistent with ISTS, LCO 3.6.1.3, Action Note 1.

Justification

This change is acceptable for the following reasons. Unisolating primary containment penetrations on an intermittent basis may be required for performing surveillances, repairs, routine evolutions, etc. Intermittently opening closed primary containment isolation valves is acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which the primary containment isolation valve is open and the administrative controls established to ensure the affected penetration can be isolated when a need for primary containment isolation is indicated. The administrative controls will consist of stationing a dedicated operator in the immediate vicinity of the controls of the associated isolation valve, with whom Control Room communication is immediately available. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated. This practice and the associated controls are identical to the allowance for intermittently opening manual primary containment isolation valves described in the

Bases for TS Section 3.7.

RELOCATED SPECIFICATIONS

None

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Safety Assessment Discussion of Changes

Tab 4.D

RB Ventilation Isolation and SBGT System Initiation

SAFETY ASSESSMENT OF CHANGES
TS: 3.2.C/4.2.C – REACTOR BUILDING VENTILATION ISOLATION AND STANDBY GAS TREATMENT SYSTEM INITIATION INSTRUMENTATION

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.C/4.2.C, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 34 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.A/4.2.A and 3.2.B/4.2.B to their own separate set of pages.
- Table 3.2.3, page 49 – Title modified for accuracy, column headers modified for accuracy or to adopt ISTS style, Trip Function line items given specific sequential numbering and columns repositioned for clarity and consistency.
- Table 3.2.3 Notes, page 49a - Header changed to read "ACTION Notes" and ACTION Notes renumbered and rewritten for clarity.
- Table 4.2.3, page 67 - Title modified for accuracy, Trip Function line items given specific sequential numbering, columns repositioned to place the most frequent activity (Check) first and blank entries currently shown as "--" changed to "NA".
- Table 4.2 Notes, page 74 - "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.9, A.10 and A.11.)

A.2 CTS 4.2.C specifies that instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.3. In proposed Surveillance Requirement (SR) 4.2.C.1, the reference to "and logic systems," is deleted since associated logic systems are considered part of the Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation Trip Functions as stated in DOC L.3. It is not necessary to explicitly identify logic systems in proposed SR 4.2.C.1 since proposed SR 4.2.C.2 (relocated CTS Table 4.2.3 requirements to perform Functional Tests of Trip System Logic) continues to require performance of surveillance testing of Trip System Logic (i.e., performance of Logic System Functional Tests for each Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation Trip Function). Therefore, this change is considered administrative.

A.3 CTS 4.2.C includes reference to CTS Table 4.2.3 for functional test and calibration requirements for reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation. CTS 4.2.C is revised, in proposed SR 4.2.C.1, to also include reference to check requirements consistent with CTS Table 4.2.3. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain reactor building ventilation isolation and

Standby Gas Treatment System initiation instrumentation trip functions. Therefore, this change is considered administrative in nature.

A.4 CTS Table 3.2.3 Note 2 provides allowances to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances. These allowances are moved to proposed SR 4.2.C.1. This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.5 Note 3 to CTS Table 3.2.3 provides actions when the minimum number of channels per trip system requirement is not met. These requirements are identified in a separate column in proposed Table 3.2.3 titled, "ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE." This change is a difference in presentation only and does not alter the current action requirements when required reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation channels are inoperable. Therefore, this change is considered administrative in nature.

A.6 CTS Table 3.2.3 includes a Reactor Building Vent Trip Function and a Refueling Floor Zone Radiation Trip Function, and Table 4.2.3 provides the associated instrumentation tests and frequencies. The purpose of these trip functions is to provide isolation of the reactor building and initiation of the Standby Gas Treatment System on receipt of a valid high radiation signal. As a result, the name of these trip functions are revised to "High Reactor Building Ventilation Radiation" and "High Refueling Floor Zone Radiation," respectively, in proposed Tables 3.2.3 and 4.2.3 to more accurately reflect their functions. The design and operation of the actual instrumentation is unchanged. Therefore, this change is considered administrative.

A.7 CTS Table 3.2.3 Note 3 provides actions to be taken when one or more reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation channels are inoperable. In the event these actions are not completed within the specified time period, CTS Table 3.2.3, Notes 3.A and 3.B (as applicable) require the action required by Table 3.2.3 to be taken. For each of the reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation trip functions, CTS Table 3.2.3 specifies that CTS Table 3.2.3 Note 1 is required. As a human factors improvement, the actions of CTS Table 3.2.3 Notes 1 and 3 have been combined into one action (proposed Table 3.2.3 Action Note 1). Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.8 CTS Table 3.2.3 Note 3 specifies an Applicability for reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation of "When Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation are required by Specification 3.7.B and 3.7.C." Specifications 3.7.B and 3.7.C include the requirements for the Standby Gas Treatment System and the Secondary Containment System (which requires reactor building isolation). This change provides an explicit Applicability, in proposed Table 3.2.3 for each reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation trip function. The specified Applicabilities, in proposed Table 3.2.3, are consistent with the Modes and conditions when the Standby Gas Treatment System and the Secondary Containment System are required to be operable by Specifications 3.7.B and 3.7.C, respectively, except as provided and justified in DOC L.2 and L.3 below. This change provides greater clarity and detail but does not alter the current requirements for reactor building ventilation isolation and Standby Gas Treatment System initiation instrumentation, and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.9 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to be operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.10 For the Trip System Logic associated with the reactor building ventilation and the Standby Gas Treatment System instrumentation, CTS Table 4.2.3 includes requirements to perform a calibration of Trip System Logics once per Operating Cycle. These requirements are modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." The reactor building ventilation isolation and the Standby Gas Treatment System initiation Trip Functions of CTS Table 4.2.3 do not include any time delay relays or timers necessary for proper functioning of the trip systems. Therefore, this Note is deleted and, in proposed Table 4.2.3, the reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation (proposed Trip Functions 1 through 4) do not include calibration requirements for time delay relays or timers. As a result, this change removes non-applicable detail, and is considered administrative.

A.11 CTS Table 4.2 Notes 2, 10, and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 10, and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Notes 4, 12, and 13 provides requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 4, 12, and 13 are physically moved and addressed in the changes to proposed Specifications 3.2.E and 4.2.E. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

A.12 CTS Table 4.2.3 includes separate Trip System Logic listings for the Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation functions with a requirement for performance of Functional Tests once per Operating Cycle. Trip System Logics are considered part of the Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation Trip Functions as stated in DOC L.3, and the VYNPS TS definition of Logic System Functional Test (LSFT), Definition 1.0.H, provides the required details for performance of an LSFT to verify operability of the logic circuits for these functions. Proposed Surveillance

Requirement 4.2.C.2 requires a Logic System Functional Test (LSFT) of the Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Instrumentation Trip Functions once every Operating Cycle. The details in CTS Table 4.2.3 are redundant to proposed Surveillance Requirement 4.2.C.2 and are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Therefore, the CTS Table 4.2.3 listings of Trip System Logics as separate Trip Functions are unnecessary and are deleted. Not including these details in TS is consistent with the ISTS, and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.2.3 Note 1 provides actions to isolate the Reactor Building Ventilation System and operate the Standby Gas Treatment System when the minimum number of operable instrument channels is not available, but does not state the time period in which these actions are to be completed. In the event that: 1) one or more inoperable instrument channels in any of the Table 3.2.3 Trip Functions can not be placed in trip; 2) the isolation or initiation capability can't be restored to Trip Functions for which those capabilities have not been maintained, or 3) the associated Completion Times in either case can not be met, Proposed Table 3.2.3 Action Note 1.b provides a one hour time period in which to complete the action of isolating the Reactor Building Ventilation System and placing the Standby Gas Treatment System in operation. Placing a limitation on the time allowed to complete the associated actions represents an additional restriction on plant operation since the time period allowed to complete the isolation will be controlled through TS. The change is consistent with ISTS, LCO 3.3.6.2, Condition C.

M.2 CTS Table 4.2.3 does not include explicit requirements to calibrate trip units. Proposed Table 4.2.3 requires calibration of the trip units of the following Trip Functions every 3 months: Low Reactor Vessel Water Level (proposed Table 4.2.3 Trip Function 1) and High Drywell Pressure (proposed Table 4.2.3 Trip Function 2). The trip units of these Trip Functions are currently required by CTS Table 4.2.3 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. This change is consistent with the ISTS, LCO 3.3.6.1, SR 3.3.6.1.3.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Table 3.2.3 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.C and Table 3.2.3 require the reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.3 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required reactor building ventilation isolation and the Standby Gas Treatment System initiation Trip Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 CTS Table 3.2.3 Note 3 contains design and operational details of the reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation (i.e., there shall be two operable or tripped trip systems for each Trip Function). These details are not necessary to ensure the operability of associated reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation. Therefore, the information in this note is to be relocated to Specification 3.2.C Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.C and the associated Surveillance Requirements for the associated reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 Discussion of Change

The Applicability of the Low Reactor Vessel Water Level Trip Function of CTS Table 3.2.3 is "When Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation are required by Specification 3.7.B and 3.7.C." The requirements of Specifications 3.7.B and 3.7.C, and as a result the requirements for this Trip Function, are applicable in Run, Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F) and during operations with a potential for draining the reactor vessel, during movement of irradiated fuel assemblies or fuel cask in secondary containment, and during alteration of the reactor core. Proposed Table 3.2.3 Trip Function 1 is revised to only be required in Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F) and during OPDRVs. This change is consistent with the ISTS in that ISTS Table 3.3.6.2-1, Trip Function 1, does not require the Low Reactor Vessel Water Level Trip Function to be operable during movement of irradiated fuel assemblies or fuel cask in secondary containment, or during alteration of the reactor core.

Justification

The Low Reactor Vessel Water Level Trip Function is required to support the operability of the Secondary Containment System and the Standby Gas Treatment System to ensure fission products entrapped within secondary containment are treated prior to discharge to the environment. When the plant is in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F), the probability and consequences of a design basis accident that is postulated to leak fission products into secondary containment are reduced due to the temperature and pressure limitations in these Modes and conditions. However, in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F), activities are conducted for which significant releases of radioactivity are postulated due to reductions in reactor vessel water level. As a result, the Low Reactor Vessel Water Level Trip Function is required to be operable in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F), when activities are in progress which could result in reactor vessel water level reductions (i.e., during operations with the potential for draining the reactor vessel (OPDRVs)). Low Reactor Vessel Water Level actuation of the reactor building ventilation isolation and the Standby Gas Treatment System initiation are not assumed to mitigate the consequences of postulated events in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F) when operations with the potential for draining the reactor vessel (OPDRVs) are not being conducted. In Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F), when other activities are conducted for which significant releases of radioactivity are postulated (i.e., movement of irradiated fuel assemblies or fuel cask in secondary containment and alteration of the reactor core) and OPDRVs are not being conducted, reactor building ventilation isolation and Standby Gas Treatment System initiation Trip Functions 3 and 4 are required to be operable to generate the required isolation and initiation signals. Therefore, the Low Reactor Vessel Water Level Trip Function is not required to be operable during movement of irradiated fuel assemblies or fuel cask in secondary containment, and during alteration of the reactor core.

L.2 Discussion of Change

The Applicability of the High Drywell Pressure Trip Function of CTS Table 3.2.3 is "When Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation are required by Specification 3.7.B and 3.7.C." The requirements of Specifications 3.7.B and 3.7.C, and as a result the requirements for this Trip Function, are applicable in Run, Startup/Hot Standby, Hot Shutdown, and Refuel (with reactor coolant water temperature > 212°F) and during operations with a potential for draining the reactor vessel, during movement of irradiated fuel assemblies or fuel cask in secondary containment, and during alteration of the reactor core. Proposed Table 3.2.3 Trip Function 2 is revised to only be required in Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). This change is consistent with the ISTS in that ISTS Table 3.3.6.2-1, Trip Function 2, does not require the High Drywell Pressure Trip Function to be operable during operations with a potential for draining the reactor vessel, during movement of irradiated fuel assemblies or fuel cask in secondary containment, or during alteration of the reactor core.

Justification

The High Drywell Pressure Trip Function is required to support the operability of the Secondary Containment System and the Standby Gas Treatment System to ensure fission products entrapped within secondary containment are treated prior to discharge to the environment. When the plant is in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F), the probability and consequences of a design basis accident that is postulated to leak fission products into secondary containment are reduced due to the temperature and pressure limitations in these Modes and conditions. In addition, in these Modes or conditions, there is insufficient energy in the reactor vessel to pressurize the primary containment and the primary containment is not required to be operable. High Drywell Pressure actuation of the reactor building ventilation isolation and the Standby Gas Treatment System initiation is not assumed to mitigate the consequences of postulated events in Cold Shutdown or Refuel (with reactor coolant water temperature ≤ 212°F). In Cold Shutdown or

Refuel (with reactor coolant water temperature ≤ 212°F), when other activities are conducted for which significant releases of radioactivity are postulated (i.e., operations with a potential for draining the reactor vessel, movement of irradiated fuel assemblies or fuel cask in secondary containment and alteration of the reactor core), other reactor building ventilation isolation and Standby Gas Treatment System initiation Trip Functions are required to be operable to generate the required isolation and initiation signals if required. Therefore, the High Drywell Pressure Trip Function is not required to be operable during operations with a potential for draining the reactor vessel, movement of irradiated fuel assemblies or fuel cask in secondary containment, or alteration of the reactor core.

L.3 Discussion of Change

CTS Table 3.2.3 includes requirements for Trip System Logics associated with the reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions. The CTS Table 3.2.3 listing of Trip System Logics as separate Trip Functions is deleted. This change is consistent with the ISTS, Table 3.3.6.2-1.

Justification

Trip Systems Logics are the circuits that operate to cause a protective action to occur upon actuation of one or more instrument channel trip signals. Trip System Logics are considered part of the reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions and the requirements for these associated Trip System Logics to be operable are encompassed by the definition of operable. Therefore, the CTS Table 3.2.3 listing of Trip System Logics as separate Trip Functions is unnecessary and is deleted. With the deletion of separate Trip System Logic Trip Functions, the actions associated with inoperable Trip System Logic (CTS Table 3.2.3 Note 1) will now be governed by the actions for the individual proposed Table 3.2.3 reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions. These proposed Table 3.2.3 Action Notes are less restrictive than the CTS Table 3.2.3 Note 1 actions. However, the proposed actions will ensure, in the event of inoperabilities, that consistent actions are applied to both reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions and their associated Trip System Logics for the same level of degradation. In addition, Change A.2 adds SR 4.2.C.2 which specifically requires performance of a Logic System Functional Test. This requirement will ensure that all portions of the reactor building ventilation isolation and Standby Gas Treatment System initiation logic systems are demonstrated to be operable. This change is acceptable, since the allowed outage times of the proposed Table 3.2.3 Action Notes will limit operation to within the bounds of the applicable analysis, i.e., NEDC-31677-P-A, "Technical Specifications Improvement Analyses for BWR Isolation Actuation Instrumentation, Part 2," July 1990, and NEDC-30851-P-A Supplement 2, "Technical Specifications Improvement Analyses for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989. Application of these analyses to the VYNPS reactor building ventilation isolation and the Standby Gas Treatment System initiation instrumentation Trip Functions, including the associated Trip System Logics, was approved by the NRC in VYNPS License Amendment No. 186 dated April 3, 2000.

SAFETY ASSESSMENT OF CHANGES
TS: 3.2.C/4.2.C – REACTOR BUILDING VENTILATION ISOLATION
AND STANDBY GAS TREATMENT SYSTEM INITIATION INSTRUMENTATION

RELOCATED SPECIFICATIONS

None

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Safety Assessment Discussion of Changes

Tab 4.E

Off-Gas System Initiation

SAFETY ASSESSMENT OF CHANGES
CTS: 3.2.D/4.2.D – OFF-GAS SYSTEM ISOLATION INSTRUMENTATION

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.D/4.2.D, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 35 - Changed to reflect relocation of TS 3.2.E/4.2.E and 3.2.F/4.2.F to their own separate set of pages.
- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.2 and R.1.)

A.2 Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS) 3.2.E, 4.2.E, and Table 4.2 Notes 4, 12, and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS 3.2.E, 4.2.E, and Table 4.2 Notes 4, 12, and 13 are physically moved and addressed in the changes to proposed Specifications 3.2.E and 4.2.E. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. CTS Table 4.2 Notes 10 and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 10 and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

R.1 3.2.D/4.2.D OFF-GAS SYSTEM ISOLATION INSTRUMENTATION

LCO Statement:

During reactor power operation, the instrumentation that initiates isolation of the off-gas system shall be operable in accordance with Table 3.2.4.

Discussion:

The radioactive off-gas processing system is not a safety system and is not connected to the primary coolant piping. The off-gas isolation instrumentation is used to ensure conformance with the discharge limits of 10 CFR 20. There is another Specification (Specification 3.8.K/4.8.K, Steam Jet Air Ejector) that ensures 10 CFR 100 limits are not exceeded in the event of a failure of the radioactive off-gas processing system. Information provided by this instrumentation on radiation levels would be of limited or no use in identifying/assessing core damage in the event of an accident, and it is not installed to detect excessive reactor coolant leakage.

Comparison to Screening Criteria:

1. Off-gas system isolation instrumentation is not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a Design Basis Accident (DBA).

2. Although off-gas activity is an initial condition of a DBA, this process variable is addressed by another Technical Specification. Criterion 2 is satisfied for the process variable (steam jet air ejector radioactivity) that is addressed by another Technical Specification. However, Criterion 2 is not satisfied for off-gas system isolation instrumentation, since this instrumentation is not a process variable that is an initial condition of a DBA or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

3. Off-gas system isolation instrumentation is not part of the primary success path that functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

4. As discussed in Sections 3.5 and 6 and summarized in Table 4-1 (item 145) of GE Topical Report NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," dated November 1987, the loss of the off-gas system isolation instrumentation was found to be a non-significant risk contributor to core damage frequency and offsite releases. VYNPS has reviewed this evaluation, considers it applicable to VYNPS, and concurs with the assessment.

Conclusion:

Since the 10CFR50.36(c)(2)(ii) screening criteria have not been satisfied, the Off-Gas System Isolation Instrumentation LCO, Actions, Surveillances and Notes will be relocated to the Technical Requirements Manual. Changes to the Technical Requirements Manual are controlled using 10 CFR 50.59.

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Safety Assessment Discussion of Changes

Tab 4.F

Control Rod Block Actuation

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.E/4.2.E, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 35 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.F/4.2.F to its own separate set of pages. (TS 3.2.D/4.2.D is being relocated as described in DOC A.2 below.)
- Table 3.2.5, page 51 – Column headers modified for accuracy or to agree with ISTS style, Trip Function line items given specific sequential numbering and columns repositioned for clarity and consistency.
- Table 3.2.5 Notes, page 52 - Header changed to read "ACTION Notes," "Not Used" and "Deleted" wording removed where previously eliminated Notes were located, Notes renumbered to adjust for deletions and new Action Notes rewritten for clarity.
- Table 4.2.5, page 69 – Title and Rod Block Monitor Trip Function header modified for accuracy and clarity.
- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining TS 4.2.5-applicable Notes have either been relocated or deleted in accordance with DOC A.4, A.7, A.8, A.9 and M.1 below.)

A.2 CTS 3.2.D and 4.2.D provide requirements that apply to off-gas isolation instrumentation. These CTS off-gas isolation instrumentation requirements are being deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.D/4.2.D, Off-Gas Isolation Instrumentation. Therefore, this change does not involve a technical change, and is considered administrative.

A.3 CTS 3.2.E indicates that, during power operation, the control rod block instrumentation shall be operable in accordance with Table 3.2.5. The Rod Block Monitor (RBM) Trip Functions (proposed Table 3.2.5, Trip Functions 1.a, 1.b and 1.c) are required by CTS Table 3.2.5 to be operable in the Run Mode. CTS Table 3.2.5 Note 7 (first sentence) applies to these Trip Functions and indicates that these Trip Functions may be bypassed when reactor power is < 30% of Rated Thermal Power. The intent of this note is to waive the operability requirements of the RBM Trip Functions when reactor power is < 30%. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.5 requires the RBM Trip Functions to be operable when reactor power is > 30% RATED THERMAL POWER which is equivalent to CTS requirements. For the Reactor Mode Switch – Shutdown Position Trip Function, CTS Table 3.2.5 Note 12 modifies the requirements and indicates that this Trip Function is required to be operable when the reactor mode switch is in the shutdown position. The "APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS" column in proposed Table 3.2.5 requires the Reactor Mode Switch – Shutdown Position to be operable as identified in proposed Table 3.2.5 Footnote (a). This footnote states, "When the reactor mode switch is in the shutdown position." As such, these changes are considered administrative in nature.

A.4 CTS 4.2.E specifies that instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.5. In proposed Surveillance Requirement (SR) 4.2.E.1, the reference to "and logic system," is deleted since associated logic systems are considered part of the Control Rod Block Instrumentation Trip Functions included in proposed Tables 3.2.5 and 4.2.5. In addition, proposed Tables 3.2.5 and 4.2.5 will delete explicit reference to "Trip System Logic" as a separate Trip Function. The requirement that the "Trip System Logic" be operable is specified by both the definition of Operable and the TS operability requirements for the Control Rod Block Instrumentation Trip Functions, without explicit reference to "Trip System Logic." The Control Rod Block Instrumentation design at VYNPS only includes one "Trip System Logic." Therefore, when the "Trip System Logic" is inoperable, both RBM channels would be inoperable and proposed Table 3.2.5 Action Note 1.b, would require one channel to be tripped in one hour, which is equivalent to the actions in CTS Table 3.2.5 Note 8 (which is also proposed to be deleted as part of this change). For the purpose of testing, it is not necessary to explicitly identify "Trip System Logic" in CTS Table 4.2.5 for this design, since proposed Table 4.2.5 continues to require performance of surveillance testing of the "Trip System Logic" through the requirements for performance of Instrument Functional Tests and Calibrations. Therefore, this change does not involve a technical changes, but is only a difference in presentation and is considered administrative.

A.5 CTS Table 3.2.5 Note 10 provides an allowance to delay entry into actions for 6 hours for the situation of a RBM channel inoperable solely for performance of surveillances. This allowance is moved to proposed SR 4.2.E.1. This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.6 Notes 9 and 13 to CTS Table 3.2.5 provide actions when the required channels requirement is not met for the associated Trip Functions. These requirements are identified in a separate column in proposed Table 3.2.5 titled, "ACTIONS WHEN REQUIRED CHANNELS ARE INOPERABLE," for each of the associated Trip Functions This change is a difference in presentation only and does not alter the current action requirements when required control rod block instrumentation channels are inoperable. Therefore, this change is considered administrative in nature.

A.7 For the Trip System Logic associated with the RBM control rod block instrumentation, CTS Table 4.2.5 includes requirements to perform a calibration of Trip System Logics once per Operating Cycle. These requirements are modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." The control rod block instrumentation Trip Functions of CTS Table 4.2.5 do not include any time delay relays or timers necessary for proper functioning of the trip systems. Therefore, this Note is deleted and, in proposed Table 4.2.5, the control rod block instrumentation trip functions (proposed Trip Functions 1.a, 1.b, 1.c, and 2) do not include calibration requirements for time delay relays or timers. As a result, this change removes non-applicable detail, and is considered administrative.

A.8 CTS Table 4.2.5 includes Functional Test requirements for the RBM Upscale and Downscale Trip Functions. These requirements are modified by CTS Table 4.2 Note 4. Note 4 states, "This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel." The definition of Instrument Functional Test for this type of instrumentation (CTS 1.0.G.1) is, "the injection of a signal into the channel as close to the sensor as practicable to verify operability including alarm and/or trip functions." The requirements of CTS Table 4.2 Note 4 are consistent with the requirements of the Instrument Functional Test definition. The CTS definition of Instrument Functional Test allows the method of testing described in CTS Table 4.2 Note 4 to be used. Therefore, CTS Table 4.2 Note 4 is unnecessary and is deleted. This change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.9 CTS Table 4.2 Notes 2, 8, 10, and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 8, 10, and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

A.10 CTS Table 4.2.5 includes Functional Test requirements for the RBM Upscale and Downscale Trip Functions. These requirements are modified by CTS Table 4.2 Note 13. Note 13 states, as applicable to the RBM Upscale (Flow Bias) Trip Function calibration requirement: "Includes calibration of the RBM Reference Downscale function (i.e., RBM upscale function is not bypassed when > 30% Rated Thermal Power." CTS Table 4.2 Note 13 is relocated to Footnote (c) in proposed Table 4.2.5.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 4.2 Note 12 applies to the Reactor Mode Switch – Shutdown Position Trip Function. This note allows the Functional Test of the Reactor Mode Switch – Shutdown Position Trip Function to be initiated within 1 hour after the reactor mode switch is placed in shutdown. This note does not include a time limit on completion of the Functional Test. Since testing of this Trip Function with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable links, the intent of this allowance is to ensure the required Functional Test is completed in a timely manner as soon as plant conditions exist to perform the test. Therefore, in proposed Table 4.2.5 Footnote (a), the allowance is revised by requiring the Functional Test of this Trip Function to be performed (i.e., completed) within 1 hour after the reactor mode switch is placed in the shutdown position. The 1 hour allowance continues to provide a reasonable time in which to complete the required Functional Test. This change represents an additional restriction on plant operation necessary to ensure that the Functional Test is satisfactorily completed in a timely manner. The change is consistent with the ISTS, LCO 3.3.2.1, SR 3.3.2.1.6.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Table 3.2.5 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.E and Table 3.2.5 require the control rod block instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.5 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required control rod block instrumentation Trip Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 The LPRM inputs for operability of the RBM are relocated to Specification 3.2.E Bases, and the applicability is clarified to provide for adequate coverage of the entire core in the axial direction for every non-peripheral control rod selected for movement. The Specification 3.2.E Bases indicates that if sufficient LPRMs are not available (the same requirements as specified in CTS Table 3.2.5, Note 7, second sentence), then the associated RBM is inoperable. As such, CTS Table 3.2.5 Note 7, second sentence, is not necessary in VYNPS TS control rod block instrumentation Table 3.2.5. The above definition of operability suffices. Therefore, the relocated details of the note are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 CTS Table 3.2.5 Note 5 contains design and operational details of the RBM Upscale (Flow Bias) Trip Function Trip Setting for two recirculation loop and single recirculation loop operation. These details are not necessary to ensure the operability of the RBM Upscale (Flow Bias) Trip Function. Therefore, the information in this note is to be relocated to Specification 3.2.E Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.E and associated Table 3.2.5 which includes RBM Upscale (Flow Bias) Trip Function Trip Settings for both two recirculation loop and single recirculation loop operation are adequate to ensure the RBM Upscale (Flow Bias) Trip Function is maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.4 Deleted.

"Specific"

L.1 Deleted.

L.2 Discussion of Change

This change adds a note to the RBM Instrument Calibrations in CTS Table 4.2.5 excluding the neutron detectors from this Surveillance (proposed Table 4.2.5 Footnote (b)). This change is consistent with the ISTS, LCO 3.3.2.1, SR 3.3.2.1.4.

Justification

This change is acceptable for the following reasons. The Instrument Calibration is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. The neutron detectors are excluded from the RBM Instrument Calibration because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. In addition, changes in neutron detector sensitivity are compensated for by performing the 7 day heat balance calibration and the 2000 MWD/T Local Power Range Monitor calibration using the Traversing Incore Probe System of the VYNPS Reactor Protection System TS.

RELOCATED SPECIFICATIONS

None

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Tab 4.G

Mechanical Vacuum Pump Isolation

SAFETY ASSESSMENT OF CHANGES
TS 3.2.F/4.2.F – MECHANICAL VACUUM PUMP ISOLATION INSTRUMENTATION

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.F/4.2.F, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 35 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.E/4.2.E to its own separate set of pages. (TS 3.2.D/4.2.D is being relocated to the TRM as described in DOC A.2 below.)
- TS 3.2/4.2, page 36 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.G/4.2.G to its own separate set of pages. (TS 3.2.H/4.2.H is being relocated to the TRM as described in DOC A.2 below.)

A.2 CTS 3.2.D and 4.2.D provide requirements that apply to off-gas isolation instrumentation. These CTS off-gas isolation instrumentation requirements are deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.D/4.2.D, Off-Gas Isolation Instrumentation. CTS 3.2.E and 4.2.E provide requirements that apply to control rod block actuation instrumentation. These CTS control rod block actuation instrumentation requirements are relocated to a separate set of pages within the TS. CTS 3.2.G and 4.2.G provide requirements that apply to post-accident instrumentation. These CTS post-accident instrumentation requirements are relocated to a separate set of pages within the TS. CTS 3.2.H and 4.2.H provide requirements that apply to drywell to torus ΔP instrumentation. These CTS drywell to torus ΔP instrumentation requirements are deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.H/4.2.H, Drywell to Torus ΔP Instrumentation. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 3.2.F.1 provides actions for one or more mechanical vacuum pump isolation instrumentation channels inoperable. These actions provide 12 hours to restore the inoperable channel(s) or place them or their associated trip system in the trip condition. Proposed TS 3.2.F.2 is revised to address the condition of multiple, inoperable, untripped mechanical vacuum pump isolation instrumentation channels that result in the High Main Steam Line Radiation Trip Function not maintaining mechanical vacuum pump isolation capability. The proposed change will eliminate the 12 hour allowed outage time for this condition. In this condition (i.e., loss of mechanical vacuum pump isolation capability), continued operation in accordance with the 12 hour allowed outage time is not appropriate, nor consistent with the applicable analyses of NEDC-30851P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS

Instrumentation." This change is an additional restriction on plant operation necessary to achieve consistency with applicable analyses. The ISTS, Section 3.3, does not address Mechanical Vacuum Pump Isolation Instrumentation or associated Trip Functions for isolation on High Main Steam Line Radiation.

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

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Tab 4.H

Post-Accident Monitoring Instrumentation

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.G/4.2.G, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, page 36 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.F/4.2.F to its own separate set of pages. (TS 3.2.H/4.2.H is being relocated to the TRM as described in DOC A.3 below.)

- Table 3.2.6, page 53 – Title modified for accuracy, column headers modified for accuracy and to agree with ISTS style, columns repositioned for clarity, Parameters (Functions) given specific sequential numbering, reference to Note 3 under each Parameter (Function) eliminated due to combination in proposed Note 1, reference to Note 1 relocated to a new column and Containment High Range Radiation Monitor Parameter (Function 9) relocated from page 54.

- Table 3.2.6, page 54 – Remaining Parameter (Function) on second page of table moved to first page of table, conformed to new column format and given a specific sequential number, and Note 6 renumbered as Note 2 due to combination in proposed Note 2.

- Table 3.2.6 Notes, page 55 - Header changed to read "ACTION Notes," "Deleted" wording removed where previously eliminated Notes were located, Notes renumbered to adjust for deletions and new Action Notes rewritten for clarity.

- Table 4.2.6, pages 70 and 71 – Titles and column headers modified for accuracy, columns repositioned to place the more frequent activity (Check) first and Parameters (Functions) given specific sequential numbering.

- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.6 and R.1.)

A.2 CTS 4.2.G includes reference to CTS Table 4.2.6 for functional test and calibration requirements for post-accident monitoring instrumentation. CTS 4.2.G is revised, in proposed Surveillance Requirement (SR) 4.2.G.1, to delete the reference to functional testing and include reference to check requirements consistent with CTS Table 4.2.6. (CTS Table 4.2.6 includes calibration and check requirements, but does not include Functional Test requirements). This change properly aligns the text with the table and does not alter the current requirements for periodic checks and calibrations of post-accident monitoring instrument functions. Therefore, this change is considered administrative in nature.

A.3 CTS 3.2.H and 4.2.H provide requirements that apply to drywell to torus ΔP instrumentation. These CTS drywell to torus ΔP instrumentation requirements are being deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.H/4.2.H, Drywell to Torus ΔP Instrumentation. Therefore, this change does not involve a technical change, and is considered administrative.

A.4 CTS Table 3.2.6 Note 8 provides an allowance to delay entry into actions for 6 hours for the situation of a post-accident monitoring instrumentation channel inoperable solely for performance of surveillances. This allowance is moved to proposed SR 4.2.G.1. This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.5 CTS 3.2.G specifies an Applicability for post-accident monitoring instrumentation of "During reactor power operation." The CTS definition of reactor power operation states "Reactor power operation is any operation with the mode switch in the Startup/Hot Standby or Run..." This change provides an explicit Applicability, in proposed Table 3.2.6, for each post-accident monitoring instrumentation Function. The specified Applicabilities in proposed Table 3.2.6 are consistent with the CTS definition of reactor power operation (i.e., RUN and STARTUP/HOT STANDBY). Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, providing explicit Modes or Conditions of Applicability for each trip function, is consistent with the ISTS.

A.6 CTS Table 4.2 Notes 2, 8, 10, and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 8, 10, and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Notes 12, and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 12, and 13 are physically moved and changes addressed in proposed Specifications 3.2.E and 4.2.E. CTS Table 4.2 Note 3 provides requirements that apply to ECCS, PCIS, Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation, Off-Gas System Isolation, Control Rod Block Actuation and RCIC Instrumentation. The requirements of CTS Table 4.2 Note 3 are physically moved and addressed in the changes for proposed Specifications 3.2.A/4.2.A (DOC A.11), 3.2.B/4.2.B (DOC A.22), 3.2.C/4.2.C (DOC A.10), 3.2.D/4.2.D (DOC R.1), 3.2.E/4.2.E (DOC A.7) and 3.2.L/4.2.L (DOC A.8). CTS Table 4.2 Note 4 provides requirements that apply to Recirculation Pump Trip and Control Rod Block Actuation Instrumentation. The requirements of CTS Table 4.2 Note 4 are physically moved and addressed in the changes for proposed Specifications 3.2.E/4.2.E and 3.2.I/4.2.I. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

A.7 CTS 3.2.G includes descriptive information regarding the design, location and analysis assumptions of post accident monitoring parameters. As described in DOC A.5 of this Safety Assessment of Changes, this general information is being replaced with reference to Table 3.2.6 for each post accident monitoring function. Similar information is included in the Bases for CTS 3.2 (CTS Page 79) and is being retained in the Background section of the proposed Bases for TS Section 3.2.G/4.2.G (proposed Page 79). Such information is not necessary for determination of the requirements of the specification. Therefore, this change does not involve a technical change and is considered administrative.

A.8 The parameter labeled "Containment Pressure" in CTS Table 3.2.6 is designated as Function 2 and is being renamed "Drywell Pressure" in proposed Table 3.2.6. The VY Primary Containment is comprised of two sections, the Drywell and the Suppression Chamber (also referred to as the Torus). These two sections have separate airspaces that normally do not communicate. The Post-Accident Monitoring Instrumentation required by proposed Table 3.2.6 as Function 2 is only capable of monitoring the pressure in the Drywell portion of the Primary Containment. This change in designation provides a more accurate description of the monitoring function of the subject instrumentation. Therefore, this change does not involve a technical change, and is considered administrative.

A.9 The parameter in CTS Table 3.2.6 Function 3, "Torus Pressure" (Meters #PI-16-19-36A(B)) lists the Instrument Range as (-15) – (+ 65) psig. The actual range of the installed instruments is (-15) – (+85) psig. This information is being corrected in the TS Table before being relocated per DOC LA.1. This information is also being corrected in the Proposed Bases for the Applicable Safety Analyses for Function 3.

<u>TECHNICAL CHANGES - MORE RESTRICTIVE</u>

None

<u>TECHNICAL CHANGES - LESS RESTRICTIVE</u>

"Generic"

LA.1 The CTS Table 3.2.6 details relating to system design and operation (i.e., type of indication, specific instrument tag numbers, and instrument range) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.G and Table 3.2.6 require the post-accident monitoring instrument Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.6 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required post-accident monitoring instrument Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

<u>RELOCATED SPECIFICATIONS</u>

R.1 3.2.G/4.2.G, POST-ACCIDENT INSTRUMENTATION

<u>LCO Statement:</u>

During reactor power operation, the instrumentation that displays information in the Control Room necessary for the operator to initiate and control the systems used during and following a postulated accident or abnormal operating condition shall be operable in accordance with Table 3.2.6.

Discussion:

Each individual post-accident monitoring parameter has a specific purpose; however, the general purpose for accident monitoring instrumentation is to provide sufficient information to confirm an accident is proceeding per prediction, i.e. automatic safety systems are performing properly, and deviations from expected accident course are minimal.

Comparison to Deterministic Screening Criteria:

The NRC position on application of the deterministic screening criteria to post-accident monitoring instrumentation is documented in letter dated May 7, 1988 from T.E. Murley (NRC) to R.F. Janecek (BWROG). The position was that the post-accident monitoring instrumentation table list should contain, on a plant specific basis, all Regulatory Guide 1.97 Type A instruments specified in the plant's Safety Evaluation Report (SER) on Regulatory Guide 1.97, and all Regulatory Guide 1.97 Category 1 instruments. Accordingly, this position has been applied to the VYNPS Regulatory Guide 1.97 instruments. Those instruments meeting these criteria have remained in Technical Specifications. The instruments not meeting these criteria have been relocated from the Technical Specifications to plant controlled documents.

The following summarizes the VYNPS position for those instruments currently in Technical Specifications.

From NRC SER dated December 4, 1990, Subject: Conformance to Regulatory Guide 1.97 for Vermont Yankee Nuclear Power Station:

Type A Variables

1. Reactor Pressure
2. Reactor Vessel Level
3. Drywell Pressure
4. Drywell Temperature
5. Torus Pressure
6. Torus Water Temperature
7. Torus Water Level
8. Torus Airspace Temperature

From Regulatory Guide 1.97 and VYNPS submittal to the NRC dated October 30, 1984, and NUREG-0737, Supplement 1 - Regulatory Guide 1.97, as modified by VYNPS letters dated October 25, 1985, August 11, 1987, July 28, 1988, September 1, 1989, and March 29, 1996, and NRC letter dated April 29, 1993.

Other Type, Category 1 Variables

Primary Containment Isolation Valve Position
Containment and Drywell Hydrogen Concentration
Containment and Drywell Oxygen Concentration
Primary Containment High Radiation

For other post-accident monitoring instrumentation currently in Technical Specifications, their loss is not risk-significant since the variable they monitored did not qualify as a Type A or Category 1 variable (one that is important to safety and needed by the operator, so that the operator can perform necessary normal actions).

Conclusion

Since the screening criteria have not been satisfied for non-Regulatory Guide 1.97 Type A or Category 1 variable instruments, their associated LCOs and Actions, Surveillance Requirements, and applicable Table 3.2.6 and 4.2.6 Notes may be relocated to the Technical Requirements Manual. Changes to the Technical Requirements Manual are controlled using 10 CFR 50.59. The instruments to be relocated are as follows:

1. Safety/Relief Valve Position from Pressure Switches
2. Safety Valve Position from Acoustic Monitor
3. Stack Noble Gas Effluent

This conclusion also supports relocating the surveillance requirements of CTS Table 4.2 Note 9, for the thermocouples that provide back-up position indication for the Main Steam Safety/Relief Valves and Safety Valves, to the Technical Requirements Manual.

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Tab 4.I

DW-to-Torus ΔP Instrumentation

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.H/4.2.H, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2/4.2, Page 36 and 37 - Changed to reflect relocation of TS 3.2.G/4.2.G and TS 3.2.I/4.2.I to their own separate set of pages. (TS 3.2.H/4.2.H has been relocated to the TRM by DOC R.1 below.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

R.1 CTS 3.2.H and 4.2.H specify requirements for the drywell to torus Δp instrumentation. This monitoring instrumentation does not necessarily relate directly to maintaining the monitored parameter (drywell to torus Δp) within limits. The ISTS do not specify indication-only equipment to be operable to support operability of a system or component or maintaining variables within limits. Control of the availability of, and necessary compensatory activities if not available, for indication and monitoring instruments are addressed by plant procedures and policies. Therefore, these requirements are to be relocated to the Technical Requirements Manual.

The requirement specified in 10 CFR 50.36(c)(2)(ii) for inclusion of a limiting condition for operation in the TS is that one or more of the following criteria are met:

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 4: A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Since drywell to torus Δp is not indicative of a degradation of the reactor coolant pressure boundary, the drywell to torus Δp instrumentation does not meet Criterion 1. Drywell to torus Δp is monitored in order to maintain differential pressure to ensure that the pressure suppression system is ready to accept the forces associated with a Loss of Coolant Accident (LOCA). It is needed prior to the onset of a LOCA, but has no safety function once a LOCA occurs. The monitored parameter (drywell to torus Δp) is an initial condition of a design basis accident analysis that assumes the failure of a fission product barrier. Therefore, the limits on this parameter required by TS 3.7.A.9/4.7.A.9 meet Criterion 2 above. However, the instrumentation used to verify compliance with these limits does not meet Criterion 2. As stated above, drywell to torus Δp is not involved with the mitigation of any accident or transient. Therefore, the drywell to torus Δp instrumentation does not meet criterion 3. TS 3.7.A.9/4.7.A.9, Drywell/Suppression Chamber d/p, provides regulatory control over the requirement to maintain drywell to torus Δp within limits. Therefore, CTS 3.2.H/4.2.H serves no purpose and is not significant to public health and safety. Therefore, the drywell to torus Δp instrumentation does not meet Criterion 4.

Changes to the Technical Requirements Manual are controlled using 10 CFR 50.59. Not including these requirements in the TS is consistent with the ISTS.

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Tab 4.J

Recirculation Pump Trip Instrumentation

SAFETY ASSESSMENT OF CHANGES
TS 3.2.I/4.2.I – RECIRCULATION PUMP TRIP INSTRUMENTATION

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.I/4.2.I, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2.I/4.2.I, page 37 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.K/4.2.K and 3.2.L/4.2.L to their own separate set of pages.
- Table 3.2.1, page 43 – Table number changed to "Table 3.2.7" to reflect separation from original Table 3.2.1 as part of relocation under TS 3.2.I/4.2.I, title modified for accuracy, column headers modified for accuracy and to agree with ISTS style, Trip Function line items given specific sequential numbers, columns repositioned for clarity and consistency and Note numbering changed to agree with renumbering of Notes on next page.
- Table 3.2.1 Notes, page 44 – Header changed to "Table 3.2.7 ACTION Notes" to reflect separation from original Table 3.2.1 as part of relocation under TS 3.2.I/4.2.I and to agree with ISTS style, and page modified to indicate relocation of Notes 9, 10 and 11 to other sections, as described in TS 3.2.A/4.2.A DOC A.5 (Note 9) and DOC A.1 (Notes 10 and 11).
- Table 3.2.1 Notes, page 44b - Header changed to "Table 3.2.7 ACTION Notes" to reflect separation from original Table 3.2.1 as part of relocation under TS 3.2.I/4.2.I and to agree with ISTS style, page modified to indicate relocation of Note 18 to another section, as described in TS 3.2.A/4.2.A DOC A.1, and Note 19 rewritten for clarity and to assign specific sub-numbering to each action statement.
- Table 3.2.7, page 55a – Wording regarding previous intentional deletion of Table 3.2.7 being removed, and to be replaced with proposed Table 3.2.7.
- Table 4.2.1, page 63 - Table number changed to "Table 4.2.7" to reflect separation from original Table 4.2.1 as part of relocation under TS 3.2.I/4.2.I, title and column headers modified for accuracy, Trip Function line items given specific sequential numbers, columns repositioned to place the most frequent activity (Check) first, and blank entries previously shown as "--" changed to "NA."
- Table 4.2.7, page 71a – Wording regarding previous intentional deletion of Table 4.2.7 being removed, and to be replaced with proposed Table 4.2.7.
- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.7, A.8, A.9 and A.10.)

A.2 CTS 3.2.H and 4.2.H provide requirements that apply to drywell to torus ΔP instrumentation. These CTS drywell to torus ΔP instrumentation requirements are being deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.H/4.2.H, Drywell to Torus ΔP Instrumentation. Therefore, this change does not involve a technical change, and is considered administrative.

A.3 CTS 3.2.I specifies an Applicability for recirculation pump trip instrumentation of "During reactor power operation." The CTS definition of reactor power operation states "Reactor power operation is any operation with the mode switch in the Startup/Hot Standby or Run..." This change provides an explicit Applicability, in proposed Table 3.2.7 for each recirculation pump instrumentation Trip Function. The specified Applicabilities in proposed Table 3.2.7 are consistent with the CTS definition of reactor power operation as modified by the CTS Table 3.2.I Note 19 actions to exit the applicability by placing the plant in Startup/Hot Standby (i.e., Run). Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.4 CTS 4.2.I includes reference to CTS Table 4.2.1 for functional test and calibration requirements for recirculation pump trip instrumentation. CTS 4.2.I is revised, in proposed Surveillance Requirement (SR) 4.2.I.1, to also include reference to check requirements consistent with CTS Table 4.2.1. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain recirculation pump trip instrument trip functions. Therefore, this change is considered administrative in nature.

A.5 CTS Table 3.2.1 Note 8 provides an allowance to delay entry into actions for 6 hours for the situation of a recirculation pump trip instrumentation channel inoperable solely for performance of surveillances. This allowance is moved to proposed SR 4.2.I.1. This change does not involve a technical change, but is only a difference in presentation. Therefore, this change is considered administrative.

A.6 CTS Table 3.2.1 Notes 3, 4, 5, 6, 7, and a portion of Note 8 provide requirements related to Emergency Core Cooling System (ECCS) instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. Therefore, the requirements of CTS Table 3.2.1 Notes 3, 4, 5, 6, 7, and the applicable portion of Note 8 are physically moved and changes addressed in proposed Specifications 3.2.A and 4.2.A. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.7 CTS Table 4.2.1 includes a requirement to perform a calibration of Recirculation Pump Trip Instrumentation Trip System Logic once per Operating Cycle. Similar to other calibration requirements for Trip System Logic in the VYNPS CTS, the intent of this requirement is to perform a calibration of time delay relays necessary for proper functioning of the trip system. In proposed Table 4.2.7, this requirement is reflected with explicit requirements to perform periodic calibrations of the required Recirculation Pump Trip Instrumentation time delay relays (i.e., proposed Table 4.2.7 Trip Function 2, Time Delay). Therefore, this change provides greater detail and clarity but does not alter the current requirement for performance of periodic time delay relay calibrations in this trip system (see DOC M.5 below), and is considered administrative.

A.8 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.9 CTS Table 4.2.1 includes Functional Test requirements for the recirculation pump trip Low – Low Reactor Vessel Water Level and High Reactor Pressure Trip Functions. These requirements are modified by CTS Table 4.2 Note 4. Note 4 states, "This instrumentation is excepted from functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel." The definition of Instrument Functional Test for this type of instrumentation (CTS 1.0.G.1) is, "the injection of a signal into the channel as close to the sensor as practicable to verify operability including alarm and/or trip functions." The requirements of CTS Table 4.2 Note 4 are consistent with the requirements of the Instrument Functional Test definition. The CTS definition of Instrument Functional Test allows the method of testing described in CTS Table 4.2 Note 4 to be used. Therefore, CTS Table 4.2 Note 4 is unnecessary and is deleted. This change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.10 CTS Table 4.2 Notes 2, 10, and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 10, and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes addressed in proposed Specifications 3.2.G and 4.2.G. CTS Table 4.2 Notes 12 and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 12 and 13 are physically moved and changes addressed in proposed Specifications 3.2.E and 4.2.E. Therefore, these changes do not involve technical changes, but are only a differences in presentation and is considered administrative.

A.11 CTS Table 4.2.1 (being relocated to proposed TS 3.2.I/4.2.I as Table 4.2.7) includes a separate Trip System Logic listing for the Recirculation Pump Trip Actuation Instrumentation with a requirement for performance of Functional Tests once per Operating Cycle. Trip System Logic is considered part of the Recirculation Pump Trip Actuation System Instrumentation Trip Functions as stated in DOC L.1, and the VYNPS TS definition of Logic System Functional Test (LSFT), Definition 1.0.H, provides the required details for performance of an LSFT to verify operability of the logic circuits for these functions. Proposed Surveillance Requirement 4.2.I.2 requires a Logic System Functional Test (LSFT) of the Recirculation Pump Trip Actuation System Instrumentation Trip Functions once every Operating Cycle. The details in CTS Table 4.2.1 are redundant to proposed Surveillance Requirement 4.2.I.2 and are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Therefore, the CTS Table 4.2.1 listing of Trip System Logic as a separate Trip Function is unnecessary and is not carried over to proposed Table 4.2.7. Not including these details in TS is consistent with the ISTS, and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.2.1 Note 19.A provides actions for the condition of a loss of recirculation pump trip capability from all recirculation pump trip instrumentation trip functions, except Trip System Logic. In the event all applicable recirculation pump trip instrumentation trip functions lose trip capability, CTS Table 3.2.1 Note 19.A only requires one trip function to be restored within one hour. The intent of this action was to ensure that in the event of a loss of recirculation pump trip capability from both the low reactor vessel water level function and the high reactor pressure function, recirculation pump trip capability for at least one of these two functions would be restored within one hour to support continued operation in that condition for 72 hours. However, CTS Table 3.2.1 includes a Low – Low Reactor Vessel Water Level Trip Function (proposed Table 3.2.1 Trip Function 1); a Time Delay Trip Function (proposed Table 3.2.1 Trip Function 2), which supports the operability of the Low – Low Reactor Vessel Water Level Trip Function; and High Reactor Pressure Trip Function (proposed Trip Function 3) for which CTS Table Note 19 is applicable. As a result, if all three applicable Trip Functions lose trip capability and only one Trip Function is restored, it is still possible that a loss of recirculation pump trip capability would exist for both the low reactor vessel water level function and the high drywell pressure function (e.g., in the case where only trip capability of the Time Delay Trip Function is restored) and operation would be allowed to continue for 72 hours in this condition. Therefore, in the event all applicable recirculation pump trip instrumentation trip functions lose trip capability, CTS Table 3.2.1 Note 19.A is revised in proposed Table 3.2.7 Action Note 1.c to require restoration of trip capability for all but one Trip Function within one hour. A corresponding change is also made to CTS Table 3.2.1 Note 19.C. CTS Table 3.2.1 Note 19.C states "Within 72 hours from discovery of one trip function capability not maintained..." The CTS Table 3.2.1 Note 19.C reference to "one trip function capability not maintained" is changed in proposed Table 3.2.7 Action Note 1.b to "Trip Functions 1 and 2 with recirculation pump trip capability not maintained or Trip Function 3 with recirculation pump trip capability not maintained". This change represents an additional restriction on plant operation to ensure continued operation with a loss of recirculation pump trip capability from both the low reactor vessel water level and high reactor pressure functions is not allowed for longer than one hour. The change is consistent with ISTS, LCO 3.3.4.2, Action Note C for the Low – Low Reactor Vessel Water Level Trip Function and the High Reactor Pressure Trip Function; LCO 3.3.4.2 does not include a time delay Trip Function for this type of recirculation pump trip instrumentation, but its inclusion is consistent with the intent.

M.2 CTS Table 3.2.1 Note 19.B requires inoperable recirculation pump trip instrumentation channels to be restored or placed in the tripped condition within 14 days. Proposed Table 3.2.7 Action Note 1.a provides the same alternative actions as CTS Table 3.2.1 Note 19.B but includes a limitation on the use of the action to place the inoperable channels in trip. Proposed Table 3.2.7 Action Note 1.a precludes the use of the action to trip the inoperable channel if the inoperability is associated with Trip Function 2 (i.e., Time Delay) channels or if the inoperability is the result of an inoperable recirculation pump trip breaker. These restrictions are added since (1) placing the Time Delay Trip Function channels in trip (as allowed by CTS Table 3.2.1 Note 19.B) does not permit performance of the intended function (providing a time delay for actuation after certain conditions are satisfied) and could make the consequences of a postulated LOCA more severe, and (2) with the channels inoperable due to an inoperable breaker, tripping the affected channels may not adequately compensate for the inoperable breaker (e.g., the breaker may be inoperable such that it will not open). This change represents an additional restriction on plant operation by requiring the channels in these conditions to be restored to operable status rather than tripped. The change is consistent with the ISTS, LCO 3.3.4.2, Action Note A for channel inoperability and Action Note D.1 regarding the breaker inoperability restriction.

M.3 CTS Table 4.2.1 does not include explicit requirements to calibrate trip units. Proposed Table 4.2.7 requires calibration of the trip units of the following Trip Functions every 3 months: Low - Low Reactor Vessel Water Level (proposed Table 4.2.7 Trip Function 1) and High Reactor Pressure (proposed Table 4.2.7 Trip Function 3). The trip units of these Trip Functions are currently required by CTS Table 4.2.1 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. This change is consistent with the ISTS, LCO 3.3.4.2, SR 3.3.4.2.3.

M.4 CTS Table 4.2.1 requires a Functional Test of the recirculation pump trip instrumentation Trip System Logic. The CTS definition of Logic System Functional Test (CTS 1.0.H) requires where possible for the action during the test to go to completion and actuate the end device (i.e., pumps will be started and valves will be opened). For the recirculation pump trip instrumentation, actuation of the end device would require actuation of the recirculation pump trip breakers. In proposed SR 4.2.I.2 (encompassing the CTS Table 4.2.1 requirement to perform functional tests of the Trip System Logic), the Logic System Functional Test of the recirculation pump trip instrumentation Trip Functions explicitly requires the actuation of the recirculation pump trip breakers to be included in the test. This change represents an additional restriction on plant operation necessary to ensure complete testing of the safety function. This change is consistent with the ISTS, LCO 3.3.4.2.5.

M.5 CTS Table 4.2.1 includes a requirement to perform a calibration of Recirculation Pump Trip Instrumentation Trip System Logic once per Operating Cycle. Similar to other calibration requirements of Trip System Logic in the VYNPS CTS, the intent of this requirement is to perform a calibration of time delay relays necessary for proper functioning of the trip system once per Operating Cycle. In proposed Table 4.2.7, this requirement is made more restrictive and is reflected with explicit requirements to perform calibrations of the required Recirculation Pump Trip Instrumentation time delay relays (i.e., proposed Table 4.2.7 Trip Function 2, Time Delay) "Every 3 Months." This change is necessary to ensure consistency with assumptions regarding the calibration frequency of these time delays used in the associated setpoint calculations. The ISTS, LCO 3.3.4.2, does not include a time delay Trip Function calibration for this type of recirculation pump trip instrumentation, but its inclusion is consistent with the intent of SR 3.3.4.2.3.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Table 3.2.1 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.I and Table 3.2.7 require the recirculation pump trip instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.7 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required recirculation pump trip instrumentation Trip Functions is maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 CTS Table 3.2.1 and associated Note 1 contain design and operational details of the ECCS and RPT instrumentation (i.e., nomenclature for each of the subsystems, that each of the two Core Spray, LPCI and RPT, subsystems are initiated and controlled by a trip system, and that subsystem "B is identical to subsystem "A"). These details are not necessary to ensure the operability of ECCS and RPT instrumentation. Therefore, the information in this note is to be relocated to Specifications 3.2.A and 3.2.I Bases, as applicable, and reference to this information is deleted from VYNPS TS. The requirements of Specifications 3.2.A and 3.2.I and the associated Surveillance Requirements for the ECCS and RPT instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 The Trip Setting associated with reactor vessel water level trip function (proposed Table 3.2.7 Trip Function 1) is currently referenced to "above the top of enriched fuel." This detail is to be relocated to the Bases. This reference is not necessary to be included in the VYNPS TS to ensure the operability of the associated recirculation pump trip instrumentation. Operability requirements are adequately addressed in proposed Specification 3.2.I, Table 3.2.7 and the specified Trip Setting. As such, this relocated reference is not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by 10 CFR 50.59. Not including these details in TS is consistent with the ISTS. As part of this change, the previous reference to ≥ 6' 10.5" (above TEF) is changed to ≥ 82.5" to agree with conventions used elsewhere in the TS.

LA.4 The details in the CTS Table 3.2.1 Note 2, relating to the method used for placing channels in trip, are to be relocated to Specification 3.2.I Bases. The requirements of proposed Table 3.2.7 ACTIONS Notes ensure inoperable channels are placed in trip or the unit is placed in a non-applicable Mode or condition, as appropriate. As a result, the relocated details in the CTS Table 3.2.1 Note 2 are not necessary for ensuring the appropriate actions are taken in the event of inoperable recirculation pump trip instrumentation channels. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 Discussion of Change

CTS Table 3.2.1 includes requirements for Trip System Logic associated with the recirculation pump trip instrumentation Trip Functions. The CTS Table 3.2.1 listing of Trip System Logic as a separate Trip Function is deleted. This change is consistent with the ISTS, LCO 3.3.4.2.

Justification

This change is acceptable for the following reasons. The Trip System Logic is the circuit that operates to cause a protective action to occur upon actuation of one or more instrument channel trip signals. Trip System Logic is considered part of the recirculation pump trip instrumentation Trip Functions and the requirements for the associated Trip System Logic to be operable are encompassed by the definition of operable. Therefore, the CTS Table 3.2.1 listing of Trip System Logic as a separate Trip Function is unnecessary and is deleted. With the deletion of the separate Trip System Logic Trip Function, the actions associated with inoperable Trip System Logic (CTS Table 3.2.1 Note 2) will now be governed by the actions for the individual proposed Table 3.2.7 recirculation pump trip instrumentation Trip Functions. These proposed Table 3.2.7 Action Notes are less restrictive than the CTS Table 3.2.1 Note 2 actions. However, the proposed actions will ensure, in the event of inoperabilities, that consistent actions are applied to both recirculation pump trip instrumentation Trip Functions and their associated Trip System Logic for the same level of degradation. In addition, SR 4.2.I.2 is being added which specifically requires performance of a Logic System Functional Test. This requirement will ensure that all portions of the recirculation pump trip logic systems are demonstrated to be operable. The allowed outage times of the proposed Table 3.2.7 Action Notes will limit operation to within the bounds of the applicable analysis, i.e., GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Outage Times For Selected Instrumentation Technical Specifications," December 1992. Application of this analysis to the VYNPS recirculation pump trip instrumentation Trip Functions, including the associated Trip System Logic, was approved by the NRC in VYNPS License Amendment No. 186 dated April 3, 2000.

RELOCATED SPECIFICATIONS

None

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.K

Degraded Grid Protective System

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.K/4.2.K, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2.K/4.2.K, page 37 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.I/4.2.I and 3.2.L/4.2.L to their own separate set of pages.

- Table 3.2.8, page 56 – Title modified for accuracy, column headers modified for accuracy and to agree with ISTS style, Parameter (Trip Function) line items given specific sequential numbering, columns repositioned for clarity and Trip Setting numerical values and ranges reformatted to adopt a "≥" and "≤" notation instead of the previous "±" notation.

- Table 3.2.8 Notes, page 56 – Notes relocated to a separate page, retitled "ACTION Notes" and rewritten for clarity.

- Table 4.2.8, page 72 – Title and column headers modified for accuracy, Trip Function line items given specific sequential numbering, table restructured for clarity and Footnote (a) - formerly Note 10 - relocated from Table 4.2 Notes, page 74 and rewritten for clarity.

- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located, and relocated Note 10 to Table 4.2.8 as Footnote (a). (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.4 and A.5 below.)

A.2 CTS 3.2.H and 4.2.H provide requirements that apply to drywell to torus ΔP instrumentation. These CTS drywell to torus ΔP instrumentation requirements are deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.H/4.2.H, Drywell to Torus ΔP Instrumentation. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.3 CTS 3.2.K specifies an Applicability for Degraded Grid Protective System instrumentation of "During reactor power operation." This change provides an explicit Applicability, in proposed Table 3.2.8 for each Degraded Grid Protective Instrumentation Trip Function. The specified Applicability, in proposed Table 3.2.8, is consistent with the Modes and conditions specified in CTS 3.2.K, except as provided and justified in DOC M.1 below. This change provides greater clarity and detail but does not alter the current requirements for Degraded Grid Protective System instrumentation, and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.4 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.5 CTS Table 4.2 Notes 2, 3 and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 3 and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. CTS Table 4.2 Notes 4, 12 and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 4, 12 and 13 are physically moved and changes are addressed in proposed Specifications 3.2.E and 4.2.E. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 3.2.K requires the Degraded Grid Protective System instrumentation to be operable only during reactor power operation. In proposed Table 3.2.8, the Applicability of the Degraded Grid Protective instrumentation Trip Functions is expanded in Footnote (a) to, "When the associated diesel generator is required to be operable." The VYNPS CTS Applicability for diesel generators, which are supported by the Degraded Grid Protective instrumentation, includes more than just "during power operation." For example, CTS 3.5.H.4 (which provides low pressure Emergency Core Cooling System (ECCS) requirements) requires a diesel generator to be operable during Refuel or Cold Shutdown when operations with the potential for draining the reactor vessel are being performed and CTS 3.7.B.1.b (which provides Standby Gas Treatment System requirements) requires diesel generators to operable under certain conditions during Refuel or Cold Shutdown when secondary containment integrity is required. This change represents an additional restriction on plant operation necessary to ensure that the ECCS and other assumed systems powered by the diesel generators remain capable of providing plant protection during the conditions when the diesel generators are required to be operable.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Table 3.2.8 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.K and Table 3.2.8 require Degraded Grid Protective instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.8 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required Degraded Grid Protective instrumentation Trip Functions is maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 The details in the CTS Table 3.2.8 Note 1, relating to the method used for placing channels in trip, are to be relocated to Specification 3.2.K Bases. The requirements of proposed Table 3.2.8 Action Notes are adequate to ensure inoperable channels are placed in trip. As a result, the relocated details in the CTS Table 3.2.8 Note 1 are not necessary for ensuring the appropriate actions are taken in the event of inoperable Degraded Grid Protective instrumentation channels. As such, these relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 Discussion of Change

When one or more Degraded Bus Voltage – Time Delay channels are inoperable, CTS Table 3.2.8, Note 2 limits operation to 7 days, but does not include explicit actions to restore the inoperable channels. In proposed Table 3.2.8 Action Note 2, an explicit requirement is provided to restore the inoperable channels within 1 hour prior to requiring the associated diesel generators to be declared inoperable. Since the applicable VYNPS diesel generator TS allows operation for up to 7 days with an inoperable diesel generator, the total time allowed for the plant to remain in reactor power operation with an inoperable Degraded Bus Voltage – Time Delay channel is extended from 7 days to 7 days + 1 hour. The 1 hour time period for this condition is provided to attempt to evaluate and repair any discovered inoperabilities prior to declaring the associated diesel generator inoperable. The change is consistent with the ISTS, Table 3.3.8.1, Action Note A.1 Completion Time.

Justification

This change is acceptable for the following reasons. The 1 hour time period is considered to be acceptable because it creates minimal additional risk while providing time for restoration of channels. This instrumentation, in conjunction with an ECCS initiation signal, provides a start signal for the diesel generators (i.e., it supports diesel generator operability). Therefore, when this instrumentation is inoperable and not restored within the required time period, the appropriate action is to declare the diesel generator inoperable. This is acceptable since the VYNPS TS requirements for diesel generators establish appropriate restrictions and compensatory measures for an inoperable diesel generator.

L.2 Discussion of Change

CTS Table 3.2.8 Note 1, in the event of one or more inoperable Degraded Bus Voltage – Voltage channels, requires the channel to be tripped within one hour, but does not provide direction regarding actions to take if the associated channels are not tripped. As such, a shutdown of the reactor would be required in accordance with 10 CFR 50.36(c)(2). Under these conditions, proposed Table 3.2.8 Action Note 1 provides actions to declare the associated diesel generator inoperable, which results in entering and taking the appropriate actions in the associated diesel generator TS if a channel is not tripped or restored within 1 hour. The change is consistent with the ISTS, LCO 3.3.8.1, Action Note B.1.

Justification

Since this instrumentation, in conjunction with an ECCS initiation signal, provides a start signal for the diesel generators (i.e., it supports diesel generator operability), the appropriate action, in this condition, would be to declare the diesel generator inoperable. The current requirements of CTS Table 3.2.8 Note 1 are overly restrictive, in that if the diesel were inoperable for other reasons, a 7 day restoration time is provided; yet currently if an instrument is inoperable and not tripped within one hour, but the diesel is otherwise fully operable, an immediate shutdown is required. This change is acceptable since the VYNPS TS requirements for diesel generators establish appropriate restrictions and compensatory measures for an inoperable diesel generator.

L.3 Discussion of Change

CTS Table 3.2.8 includes two Degraded Bus Voltage - Voltage channels per bus and two Degraded Bus Voltage - Time Delay channels per bus. One of the time delay relays for each bus feeds the actuation circuitry and the other one feeds the alarm circuitry. Both of the low voltage relays for each bus feed both the actuation and alarm circuitry. CTS Table 3.2.8 does not distinguish between the actuation and alarm circuits, and the required LCO actions are the same for each. Proposed Table 3.2.8 includes two new Trip Functions to account for the alarm circuitry: Degraded Bus Voltage - Voltage Alarm and Degraded Bus Voltage - Alarm Time Delay. Since the alarm circuitry is arranged in a one-out-of-two logic configuration, alarm capability for a bus can be maintained with one Degraded Bus Voltage - Voltage Alarm channel inoperable, and 24 hours is allowed to restore the inoperable channel to operable status (proposed Table 3.2.8 ACTION Note 3.b). If alarm capability is not maintained for a bus, either due to both Degraded Bus Voltage - Voltage Alarm channels or the one Degraded Bus Voltage - Alarm Time Delay channel being inoperable, only 1 hour is allowed to restore alarm capability (proposed Table 3.2.8 ACTION Note 3.a). If the Action and associated completion time of proposed ACTION Note 3.a or 3.b are not met, rather than declare the associated diesel generator inoperable, proposed ACTION Note 3 will require increased voltage monitoring of the associated 4.16 kV emergency bus(es) in accordance with plant procedures. ISTS does not address alarm channels in LCO 3.3.8.1 or LCO 3.8.1..

Justification

Since alarm capability for a bus can be maintained with one Degraded Bus Voltage - Voltage Alarm inoperable and this Trip Function is not common to RPS, 24 hours is allowed to restore the inoperable channel to operable status. If alarm capability is not maintained for a bus allowing 1 hour to restore alarm capability is appropriate because this allows the operator time to evaluate and repair any discovered inoperabilities. Since the Degraded Bus Voltage - Voltage Alarm and Alarm Time Delay channels do not provide an automatic protective function, but rather provide a control room annunciator function from which manual action is taken for degraded grid protection, it is appropriate to compensate for the loss of this alarm function rather than potentially require a reactor shutdown. This change is acceptable since the control room operator will still be alerted of a degraded voltage condition so that manual action for degraded grid protection can be taken in accordance with plant procedures.

RELOCATED SPECIFICATIONS

None

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.L

RCIC System Actuation

ADMINISTRATIVE

A.1 In the revision of the Vermont Yankee Nuclear Power Station (VYNPS) current Technical Specifications (CTS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the VYNPS Technical Specifications (TS) more consistent with human factor principles used in the Boiling Water Reactor Improved Standard Technical Specifications (ISTS), NUREG-1433, Rev. 3. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative. For TS 3.2.L/4.2.L, these changes are depicted in the marked-up CTS pages shown, and include:

- TS 3.2.K/4.2.K, page 37 - Rewritten for clarity after incorporation of other changes, and to reflect the relocation of TS 3.2.I/4.2.I and 3.2.K/4.2.K to their own separate set of pages.
- Table 3.2.9, page 57 - Title modified for accuracy, column headers modified for accuracy and to agree with ISTS style, Trip Function line items given specific sequential numbers, columns repositioned for clarity and consistency and Note numbering changed to agree with renumbering of Notes on next page.
- Table 3.2.9 Notes, page 58 – Notes 7, 8 and 9 renumbered as Notes 1, 2 and 3 following incorporation of other changes, and rewritten for clarity.
- Table 4.2.9, page 73 - Title and column headers modified for accuracy, Trip Function line items given specific sequential numbers, columns repositioned to place the most frequent activity (Check) first, and blank entries previously shown as "--" changed to "NA."
- Table 4.2 Notes, page 74 - "Not Used" and "Deleted" wording removed where previously eliminated Notes were located. (This Notes page is being entirely removed from the proposed TS because the remaining Notes have either been relocated or deleted in accordance with DOC A.7, A.8 and A.9 below.)

A.2 CTS 3.2.H and 4.2.H provide requirements that apply to drywell to torus ΔP instrumentation. These CTS drywell to torus ΔP instrumentation requirements are being deleted and relocated to the Technical Requirements Manual (TRM) as described in the Safety Assessment of Changes for CTS 3.2.H/4.2.H, Drywell to Torus ΔP Instrumentation. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative.

A.3 CTS 3.2.L specifies an Applicability for Reactor Core Isolation Cooling (RCIC) System instrumentation of "When the Reactor Core Isolation Cooling System is required in accordance with Specification 3.5.G." Specification 3.5.G includes the requirements for the RCIC System. This change provides an explicit Applicability, in proposed Table 3.2.9 for each RCIC System instrumentation Trip Function. The specified Applicabilities, in proposed Table 3.2.9, are consistent with the Modes and conditions when the RCIC System are required to be operable by Specification 3.5.G. Therefore, this change does not involve a technical change, but is only a difference in presentation and is considered administrative. The change, providing explicit Mode or conditions of Applicability for each trip function, is consistent with the ISTS.

A.4 CTS 4.2.L specifies that instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.9. In proposed Surveillance Requirement (SR) 4.2.L.1, the reference to "and logic systems," is deleted since associated logic systems are considered part of the Reactor Core Isolation Cooling (RCIC) System instrumentation Trip Functions as stated in DOC L.1. It is not necessary to explicitly identify logic systems in proposed SR 4.2.L.1 since proposed SR 4.2.L.2 (relocated CTS Table 4.2.9 requirements to perform Functional Tests of Trip System Logic) continues to require performance of surveillance testing of Trip System Logic (i.e., performance of Logic System Functional Tests for RCIC System Instrumentation Trip Functions). Therefore, this change is considered administrative.

A.5 CTS 4.2.L includes reference to CTS Table 4.2.9 for functional test and calibration requirements for RCIC System instrumentation. CTS 4.2.L is revised, in proposed SR 4.2.L.1, to also include reference to check requirements consistent with CTS Table 4.2.9. This change is a difference in presentation only and does not alter the current requirements to periodically perform checks of certain RCIC System instrument Trip Functions. Therefore, this change is considered administrative in nature.

A.6 CTS Table 3.2.9, Notes 5 and 6, provide allowances to delay entry into actions for 6 hours for the situation of a channel inoperable solely for performance of surveillances. These allowances are moved to proposed SR 4.2.L.1 and the allowances of these two notes are combined. This change does not involve a technical change, but is only a difference in presentation . Therefore, this change is considered administrative.

A.7 CTS Table 4.2 Note 8 states that functional tests and calibrations are not required when systems are not required to operable. The requirements of this Note are duplicated in CTS SR 4.0.1, which states that surveillances do not have to be performed on inoperable equipment. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

A.8 For the Trip System Logic associated with the RCIC System instrumentation, CTS Table 4.2.9 includes requirements to perform a calibration of Trip System Logics once per Operating Cycle. These requirements are modified by Table 4.2 Note 3. Note 3 states, "Trip system logic calibration shall include only time delay relays and timers necessary for proper functioning of the trip system." The RCIC System instrumentation Trip Functions of CTS Table 4.2.9 do not include any time delay relays or timers necessary for proper functioning of the trip systems. Therefore, this Note is deleted and, in proposed Table 4.2.9, the RCIC System instrumentation (proposed Trip Functions 1, 2, and 3) do not include calibration requirements for time delay relays or timers. As a result, this change removes non-applicable detail and is considered administrative.

A.9 CTS Table 4.2 Notes 2, 10, and 11 provide requirements that apply to ECCS instrumentation. The ECCS instrumentation is located in proposed Specifications 3.2.A and 4.2.A. The requirements of CTS Table 4.2 Notes 2, 10, and 11 are physically moved and addressed in the changes for proposed Specifications 3.2.A and 4.2.A. CTS Table 4.2 Note 9 provides requirements that apply to post-accident monitoring instrumentation. The post-accident monitoring instrumentation is located in proposed Specifications 3.2.G and 4.2.G. The requirements of CTS Table 4.2 Note 9 are physically moved and changes are addressed in proposed Specifications 3.2.G and 4.2.G. CTS Table 4.2 Notes 4, 12, and 13 provide requirements that apply to control rod block instrumentation. The control rod block instrumentation is located in proposed Specifications 3.2.E and 4.2.E. The requirements of CTS Table 4.2 Notes 4, 12, and 13 are physically moved and changes are addressed in proposed Specifications 3.2.E and 4.2.E. Therefore, these changes do not involve technical changes, but are only differences in presentation and are considered administrative.

A.10 CTS Table 4.2.9 includes a separate Trip System Logic listing for the Reactor Core Isolation Cooling (RCIC) System Instrumentation with a requirement for performance of Functional Tests once per Operating Cycle. Trip System Logic is considered part of the RCIC System Instrumentation Trip Functions as stated in DOC L.1, and the VYNPS TS definition of Logic System Functional Test (LSFT), Definition 1.0.H, provides the required details for performance of an LSFT to verify operability of the logic circuits for these functions. Proposed Surveillance Requirement (SR) 4.2.L.2 requires a Logic System Functional Test (LSFT) of the RCIC System Instrumentation Trip Functions once every Operating Cycle. The details in CTS Table 4.2.9 are redundant to proposed SR 4.2.L.2 and are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Therefore, the CTS Table 4.2.9 listing of Trip System Logic as a separate Trip Function is unnecessary and is deleted from proposed Table 4.2.9. Not including these details in TS is consistent with the ISTS, and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 4.2.9 does not include explicit requirements to calibrate trip units. Proposed Table 4.2.9 requires calibration of the trip units of the following Trip Functions every 3 months: Low-Low Reactor Vessel Water Level (proposed Table 4.2.9 Trip Function 1), Low Condensate Storage Tank Water Level (proposed Table 4.2.9 Trip Function 2), and High Reactor Vessel Water Level (proposed Table 4.2.9 Trip Function 3). The trip units of these Trip Functions are currently required by CTS Table 4.2.9 to be calibrated with the rest of the associated instrument loops once per operating cycle. Therefore, this change is more restrictive. This change is necessary to ensure consistency with assumptions regarding trip unit calibration frequency used in the associated setpoint calculations. This change is consistent with the ISTS.

M.2 CTS Table 3.2.9 specifies for the Low Condensate Storage Tank Water Level Trip Function that the Trip Setting be > 3%. The function of the Low Condensate Storage Tank Water Level is to provide an automatic transfer of the RCIC suction source from the condensate storage tank to the suppression pool when the level in the condensate storage tank is no longer sufficient to support adequate RCIC pump suction head. The CTS Trip Setting has been determined to be insufficient to ensure that transfer of the RCIC System suction from the condensate storage tank to the suppression pool occurs prior to potential vortex formation at the RCIC suction inlet in the condensate storage tank. Therefore, in proposed Table 3.2.9, the Trip Setting for the Low Condensate Storage Tank Water Level Trip Function (Trip Function 2) has been increased to > 3.81% to account for the additional water level needed to preclude the potential for vortex formation. This minimum level corresponds to the Process Limit used in the associated setpoint calculation. To account for instrument uncertainties, the instrument setpoint and as-found tolerance (i.e., instrument operability limit) were developed using the Vermont Yankee Instrument Uncertainty and Setpoints Design Guide. Footnote (b) in proposed Table 3.2.9 clarifies that the trip setting is specified in terms of percent instrument span. The instrument setpoint and as-found tolerance are located in plant procedures. This change represents an additional restriction on plant operation necessary to ensure that RCIC System operability is maintained when aligned to the condensate storage tank and that RCIC pump suction transfer to the suppression pool occurs prior to the vortex formation.

M.3 CTS Table 3.2.9 contains a column labeled "Minimum Number of Operable Instrument Channels per Trip System." For the Low-Low Reactor Vessel Water Level Trip Function, this value is listed as 2, with amplifying information provided in Notes 1 and 5. Note 1 states that there is one trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic. This note implies that there are a total of 4 instrument channels, and that all of them must be operable in order for the logic system to be single failure proof. In order to clarify this requirement, the column in proposed Table 3.2.9 is labeled "Required Channels per Function," and the value for the Low-Low Reactor Vessel Water Level Trip Function is listed as 4. This change will ensure that the logic system will be able to withstand a single failure and still perform its intended function and that appropriate actions are taken for instrument channel inoperabilities.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The CTS Table 3.2.9 details relating to system design and operation (i.e., the specific instrument tag numbers) are unnecessary in the TS and are proposed to be relocated to the Technical Requirements Manual (TRM). Proposed Specification 3.2.L and Table 3.2.9 require the RCIC System Instrumentation Trip Functions to be operable. In addition, the proposed Surveillance Requirements in Table 4.2.9 ensure the required instruments are properly tested. These requirements are adequate for ensuring each of the required RCIC System Instrumentation Trip Functions are maintained operable. As such, the relocated details are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TRM are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.2 CTS Table 3.2.9 Notes 1, 2, and 3 contain design details of the RCIC System instrumentation (i.e., one trip system with initiating instrumentation arranged in a one-out-of-two taken twice logic, one trip system with initiating instrumentation arranged in a one-out-of-two logic, and one trip system arranged in a two-out-of-two logic). These details are not necessary to ensure the operability of RCIC System instrumentation. Therefore, the information in these notes is to be relocated to Specification 3.2.L Bases and reference to this information is deleted from VYNPS TS. The requirements of Specification 3.2.L and the associated Surveillance Requirements for the RCIC System instruments are adequate to ensure the instruments are maintained operable. As such, these relocated requirements are not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by the provisions of 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

LA.3 The Trip Settings associated with reactor vessel water level trip functions (proposed Table 3.2.9 Trip Functions 1 and 3) are currently referenced to "Above Top of Enriched Fuel" in Table 3.2.9 This detail is to be relocated to the Bases. This reference is not necessary to be included in the VYNPS TS to ensure the operability of the associated RCIC System instrumentation. Operability requirements are adequately addressed in proposed Specification 3.2.L, Table 3.2.9 and the specified Trip Settings. As such, this relocated reference is not required to be in the VYNPS TS to provide adequate protection of the public health and safety. Changes to the TS Bases are controlled by 10 CFR 50.59. Not including these details in TS is consistent with the ISTS.

"Specific"

L.1 Discussion of Change

CTS Table 3.2.9 includes requirements for Trip System Logics associated with the RCIC System instrumentation Trip Functions. The CTS Table 3.2.9 listing of Trip System Logics as separate Trip Functions is deleted. This change is consistent with the ISTS, Table 3.3.5.2-1.

Justification

Trip Systems Logics are the circuits that operate to cause a protective action to occur upon actuation of one or more instrument channel trip signals. Trip System Logics are considered part of the RCIC System instrumentation Trip Functions and the requirements for these associated Trip System Logics to be operable are encompassed by the definition of operable. Therefore, the CTS Table 3.2.9 listing of Trip System Logics as separate Trip Functions is unnecessary and is deleted. With the deletion of separate Trip System Logic Trip Functions, the actions associated with inoperable Trip System Logic (CTS Table 3.2.9 Note 4) will now be governed by the actions for the individual proposed Table 3.2.9 RCIC System instrumentation Trip Functions. These proposed Table 3.2.9 Action Notes are less restrictive than the CTS Table 3.2.9 Note 4 actions. However, the proposed actions will ensure, in the event of inoperabilities, that consistent actions are applied to both RCIC System instrumentation Trip Functions and their associated Trip System Logics for the same level of degradation. In addition, DOC A.4 adds SR 4.2.L.2 which specifically requires performance of a Logic System Functional Test. This requirement will ensure that all portions of the RCIC logic systems are demonstrated to be operable. This change is acceptable, since the allowed outage times of the proposed Table 3.2.9 Action Notes will limit operation to within the bounds of the applicable analysis, i.e., GENE-770-06-2-A, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992. Application of these analyses to the VYNPS RCIC System instrumentation Trip Functions, including the associated Trip System Logics, was approved by the NRC in VYNPS License Amendment No. 186 dated April 3, 2000.

RELOCATED SPECIFICATIONS

None

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.M

Core and Containment Cooling Systems

ADMINISTRATIVE

A.1 The safety evaluation for VY TS Amendment 216 states that a simulated automatic actuation test is part of the Logic System Functional Test (LSFT). CTS 4.5.E.1.a and 4.5.G.1.a require simulated automatic actuation tests for the HPCI and RCIC Systems respectively. Proposed Specification 4.2.A.2 requires an LSFT for ECCS instrumentation Trip Functions, which includes all HPCI System Trip Functions. Proposed Specification 4.2.L.2 requires an LSFT for RCIC System instrumentation Trip Functions. Since proposed Specifications 4.2.A.2 and 4.2.L.2 provide LSFT requirements for the HPCI and RCIC Systems, the requirements of CTS 4.5.E.1.a and 4.5.G.1.a are redundant and these specifications are being deleted. In addition, supporting language in the TS 4.5 Bases is also being deleted. Since no testing requirements are being changed or deleted, this change does not involve a technical change and is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

Vermont Yankee Nuclear Power Station

Proposed Change 273

Safety Assessment Discussion of Changes

Tab 4.N

Bases for Sections 1.1/2.1, 3.1/4.1 and 3.2/4.2

SAFETY ASSESSMENT OF CHANGES
TS SECTION 3.1/4.1 – REACTOR PROTECTION SYSTEM BASES
TS SECTION 3.2/4.2 – PROTECTIVE INSTRUMENT SYSTEM BASES
TS SECTION 1.1/2.1 – FUEL CLADDING INTEGRITY BASES

ADMINISTRATIVE

A.1 The Bases of the current Technical Specifications for Sections 3.1/4.1 and 3.2/4.2 (pages 29 through 33a for Section 3.1/4.1 and pages 75 through 80a for Section 3.2/4.2) are completely replaced by revised Bases that reflect the format and applicable content of the proposed Vermont Yankee Nuclear Power Station (VYNPS) Technical Specifications in Sections 3.1/4.1 and 3.2/4.2, consistent with the Boiling Water Reactor Improved Standard Technical Specifications NUREG-1433, Rev. 3. The revised Bases are as shown in the proposed VYNPS Technical Specification Bases 3.1/4.1, pages 28 through 33p, and 3.2/4.2, pages 75 through 80q. The Bases changes are made for clarity purposes and conformance to the changes being made to the associated Technical Specifications.

In addition, the information on Trip Settings provided in the Bases for current Technical Specifications (CTS) Section 2.1 (pages 14 through17) is superseded by the revised Bases for Technical Specification Section 3.1/4.1 and no longer necessary. Therefore, this information in the Bases for CTS Section 2.1 is deleted and replaced with a statement referring to the Bases for the applicable Technical Specifications (i.e., the bases for the individual trip settings of Section 2.1 are discussed in the Bases for Specifications 3.1.A, 3.2.A, and 3.2.B). The Bases do not establish actual requirements, and as such do not change technical requirements in the Technical Specifications. Therefore, the changes are administrative in nature and have no negative impact on plant safety.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Change 273

Listing of Affected TS and Bases 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. This list supersedes the list of affected pages included in Reference 2.

Remove	Insert	Remove	Insert	Remove	Insert	Remove	Insert
i	i	-	33b	44b	-	68	68
5	5	-	33c	45	45	69	69
8	8	-	33d	46	46	70	70
10	10	-	33e	47	47	71	71
13	13	-	33f	48	48	71a	-
14	14	-	33g	48a	-	72	72
14a	-	-	33h	49	49	73	73
15	15	-	33i	49a	-	74	74
16	16	-	33j	50	50	-	74a
17	17	-	33k	51	51	75	75
20	20	-	33l	52	52	-	75a
-	20a	-	33m	53	53	-	75b
21	21	-	33n	54	54	-	75c
-	21a	-	33o	55	55	-	75d
22	22	-	33p	55a	-	-	75e
23	23	34	34	56	56	-	75f
24	24	35	35	57	57	-	75g
25	25	36	36	58	58	-	75h
26	26	37	37	59	59	-	75i
27	27	38	38	60	60	-	75j
28	28	39	39	61	61	-	75k
29	29	40	40	62	62	-	75l
30	30	41	41	63	63	-	75m
31	31	42	42	64	64	-	75n
32	32	43	43	65	65	-	75o
33	33	44	44	66	66	-	75p
33a	33a	44a	-	67	67	-	75q

Listing of Affected Technical Specifications Pages
(continued)

Remove	Insert	Remove	Insert	Remove	Insert	Remove	Insert
-	75r	-	76j	-	77e	-	80d
-	75s	-	76k	78	78	-	80e
-	75t	-	76l	-	78a	-	80f
-	75u	-	76m	-	78b	-	80g
-	75v	-	76n	-	78c	-	80h
-	75w	-	76o	-	78d	-	80i
-	75x	-	76p	79	79	-	80j
76	76	-	76q	79a	79a	-	80k
-	76a	-	76r	-	79b	-	80l
-	76b	-	76s	-	79c	-	80m
-	76c	-	76t	-	79d	-	80n
-	76d	-	76u	-	79e	-	80o
-	76e	77	77	-	79f	-	80p
-	76f	-	77a	80	80	-	80q
-	76g	-	77b	80a	80a	105	105
-	76h	-	77c	-	80b	107	107
-	76i	-	77d	-	80c	114	114

Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Change 273

Determination of No Significant Hazards Consideration

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Description of amendment request:

The proposed changes consist of a comprehensive revision to the Technical Specifications (TS) for protective instrumentation, including TS Sections 2.1, "Limiting Safety System Setting," 3.1, "Reactor Protection System," 3.2, Protective Instrument Systems," associated Surveillance Requirements, and other TS with similar requirements as these instrumentation TS sections. The Improved Standard Technical Specifications[1] were used as guidance in developing the proposed change. In addition, the associated Bases for the changed specifications have been enhanced.

Each of the proposed changes to the existing TS was categorized as involving (1) an administrative (non-technical) change (Category A), (2) the relocation of requirements (Category R), (3) more restrictive requirements (Category M), or (4) less restrictive generic and specific requirements (Categories LA and L, respectively).

Basis for no significant hazards determination:

Pursuant to 10 CFR 50.92, 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 10 CFR 50.92(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 changes do not significantly affect the design or fundamental operation and maintenance of the plant. Accident initiators or the frequency of analyzed accident events are not significantly affected as a result of the proposed changes; therefore, there will be no significant change to the probabilities of accidents previously evaluated.

   The proposed changes do not significantly alter assumptions or initial conditions relative to the mitigation of an accident previously evaluated. The proposed changes continue to ensure process variables, structures, systems, and components (SSCs) are maintained consistent with the safety analyses and licensing basis. The revised technical specifications continue to require that SSCs are properly maintained to ensure operability and performance of safety functions as assumed in the safety analyses. Since the design basis events analyzed in the safety analyses will not change significantly, the consequences of these events will not change as a result of the proposed changes to the TS.

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[1] NUREG 1433, Revision 3, Standard Technical Specifications, General Electric Plants, BWR/4, dated June 2004

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. <u>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.</u>

   The proposed changes do not involve any physical alteration of the plant (no new or different types of equipment are being installed) and do not involve a significant change in the design, normal configuration or basic operation of the plant. The proposed changes do not introduce any new accident initiators. In some cases, the proposed changes impose different or more restrictive requirements; however, these new requirements are consistent with the assumptions in the safety analyses and current licensing basis. Where requirements are relocated to other licensee-controlled documents, adequate controls exist to ensure proper maintenance of the requirements and continued operability of the associated equipment.

   The proposed changes do not involve significant changes in the fundamental methods governing normal plant operations and do not require unusual or uncommon operator actions. The proposed changes provide assurance that the plant will not be operated in a mode or condition that violates the essential assumptions or initial conditions in the safety analyses and that SSCs remain capable of performing the intended safety functions assumed in the same analyses. Consequently, the response of the plant and the plant operator to postulated events will not be significantly different.

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

3. <u>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.</u>

   Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. The proposed changes do not significantly affect any of the assumptions, initial conditions or inputs to the safety analyses. Plant design is unaffected by these proposed changes and will continue to provide adequate defense-in-depth and diversity of safety functions as assumed in the safety analyses; therefore no significant reduction in the margin of safety will result.

   There are no proposed changes to Safety Limits and only administrative and one more restrictive change to Limiting Safety System Setting requirements. The proposed changes maintain requirements consistent with safety analyses assumptions and the licensing basis. Fission product barriers will continue to meet their design capabilities without any significant impact to their ability to maintain parameters within acceptable limits. The safety functions are maintained within acceptable limits without any significant decrease in capability.

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