Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 259

Instrumentation Technical Specifications

Revised TS and Bases, Markup of CTS, Safety Assessment DOC, and NSHC

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Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 259

Instrumentation Technical Specifications

Listing of Affected Technical Specification Pages

Listing of Affected Technical Specifications Pages

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

Remove	Insert	Remove	Insert	Remove	Insert	Remove	Insert
i	i	-	33g	49	49	74	74
5	5	-	33h	49a	-	-	74a
8	8	-	33i	50	50	75	75
10	10	-	33j	51	51	-	75a
14	14	-	33k	52	52	-	75b
15	15	-	33l	53	53	-	75c
16	16	-	33m	54	54	-	75d
17	17	-	33n	55	55	-	75e
20	20	-	33o	55a	-	-	75f
21	21	-	33p	56	56	-	75g
22	22	34	34	57	57	-	75h
23	23	35	35	58	58	-	75i
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26	26	38	38	61	61	-	75l
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28	28	40	40	63	63	-	75n
29	29	41	41	64	64	-	75o
30	30	42	42	65	65	-	75p
31	31	43	43	66	66	-	75q
32	32	44	44	67	67	-	75r
33	33	44a	-	68	68	-	75s
33a	33a	44b	-	69	69	-	75t
-	33b	45	45	70	70	-	75u
-	33c	46	46	71	71	-	75v
-	33d	47	47	71a	-	-	75w
-	33e	48	48	72	72	-	75x
-	33f	48a	-	73	73	76	76

Listing of Affected Technical Specifications Pages
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-	76a	-	76q	-	78d	-	80g
-	76b	-	76r	79	79	-	80h
-	76c	-	76s	79a	79a	-	80i
-	76d	-	76t	-	79b	-	80j
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-	76m	-	78a	-	80d	90	90
-	76n	-	78b	-	80e	226	226
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Proposed

Technical Specifications

3.1 and 4.1 – Reactor Protection System

And related Technical Specifications:

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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.

Table 3.1.1 (page 1 of 2)
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(1)	1	Note 1	Note 2.a	NA
	REFUEL(2)	1	Note 1	Note 2.d	NA
2. Manual Scram	RUN, STARTUP/HOT STANDBY, REFUEL(1)	1	Note 1	Note 2.a	NA
	REFUEL(2)	1	Note 1	Note 2.d	NA
3. Intermediate Range Monitors (IRMs)					
a. High Flux	STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	≤ 120/125
	REFUEL(2)	2	Note 1	Note 2.d	≤ 120/125
b. Inop	STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	NA
	REFUEL(2)	2	Note 1	Note 2.d	NA
4. Average Power Range Monitors (APRMs)					
a. High Flux (Flow Bias)	RUN	2	Note 1	Note 2.b	≤ 0.66 (W)+ 54% and ≤ 120%(3)
b. High Flux (Reduced)	STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	≤ 15%
c. Inop	RUN, STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	NA

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

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

(3) Trip Setting ≤ 0.66(W-ΔW)+54% and ≤ 120% for single loop operation.

Table 3.1.1 (page 2 of 2)
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(1)	2	Note 1	Note 2.a	≤ 1055 psig
6. High Drywell Pressure	RUN, STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	≤ 2.5 psig
7. Reactor Low Water Level	RUN, STARTUP/HOT STANDBY, REFUEL(1)	2	Note 1	Note 2.a	≥ 127.0 inches
8. Scram Discharge Volume High Level	RUN, STARTUP/HOT STANDBY, REFUEL(1)	2 per volume	Note 1	Note 2.a	≤ 21.0 gallons
	REFUEL(2)	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	> 30% RATED THERMAL POWER	2	Note 1	Note 2.c	≥ 150 psig
11. Turbine Stop Valve Closure	> 30% RATED THERMAL POWER	4	Note 1	Note 2.c	≤ 10% valve closure

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

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

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 $\leq$ 30% 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, (1)	Within 7 Days Before entering STARTUP/HOT STANDBY(2) and Every 7 Days During STARTUP/HOT STANDBY, Every 7 Days During Refueling	Once/Operating Cycle(2),(3)
b. Inop	NA	Within 7 Days Before entering STARTUP/HOT STANDBY(2) and Every 7 Days During STARTUP/HOT STANDBY, Every 7 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(4), Each Refueling Outage for Flow Bias, Every 2000 MWD/T Average Core Exposure for LPRMs using TIP System

(1) 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.

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

(3) Neutron detectors are excluded.

(4) Not required to be performed until 12 hours after reactor power is ≥ 25% Rated Thermal Power.

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)	(1)	Within 7 Days Before entering STARTUP/HOT STANDBY[2] and Every 7 Days During STARTUP/HOT STANDBY, Every 7 Days During Refueling	Every 7 Days[2],[3]
c. Inop	NA	Every 3 Months	NA
5. High Reactor Pressure	Once/Day	Every 3 Months	Every 3 Months[5], Once/Operating Cycle
6. High Drywell Pressure	NA	Every 3 Months	Every 3 Months[5], Once/Operating Cycle
7. Reactor Low Water Level	Once/Day	Every 3 Months	Every 3 Months[5], Once/Operating Cycle
8. Scram Discharge Volume High Level	NA	Every 3 Months	Every 3 Months[5], 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

(1) 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.

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

(3) Neutron detectors are excluded.

(5) 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

B.1 During operation at ≥ 25% Rated Thermal Power with the ratio of MFLPD to FRP greater than 1.0 either:

a. The APRM System gains shall be adjusted by the ratios given in Technical Specification 2.1.A.1.a, or

b. The power distribution shall be changed to reduce the ratio of MFLPD to FRP.

4.1 SURVEILLANCE REQUIREMENTS

B. Once within 12 hours after ≥ 25% Rated Thermal Power and once a day during operation at ≥ 25% Rated Thermal Power thereafter, the maximum fraction of limiting power density and fraction of rated power shall be determined and the APRM system gains shall be adjusted by the ratios given in Technical Specification 2.1.A.1.a.

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Z. Surveillance Interval - The surveillance interval is the calendar time between surveillance tests, checks, calibrations, and examinations to be performed upon an instrument or component when it is required to be operable. These tests unless otherwise stated in these specifications may be waived when the instrument, component, or system is not required to be operable, but these tests shall be performed on the instrument, component, or system prior to being required to be operable.

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 thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in 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 > 30% of Rated Thermal Power, turbine stop valve scram shall be ≤ 10% valve closure from full open.

F. When operating at > 30% of Rated Thermal Power, turbine control valve fast closure scram shall be ≥ 150 psig acceleration relay oil pressure.

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.

Proposed

Bases

3.1 and 4.1 – 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, 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. Each channel must also respond within its assumed response time, where applicable.

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 ≤ 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

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

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," 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.

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. 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 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 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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 Trip Setting is derived from the Analytical Limit assumed in the CRDA analyses. The terms for the Trip Setting of the Average Power Range Monitor High Flux (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.

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

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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 25% 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 < 25% 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 < 25% 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.

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.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

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.

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 $\leq$ 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.

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 > 30% 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 high enough to detect imminent TCV fast closure. The actual operating point for this Trip Function is not assumed in any transient or accident analysis.

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 > 30% Rated Thermal Power. This Trip Function is not required when Thermal Power is ≤ 30% 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 > 30% 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 > 30% Rated Thermal Power. This Trip Function is not required when Thermal Power is ≤ 30% 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.

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

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.

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

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

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.

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

SURVEILLANCE REQUIREMENTS (continued)

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 1 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, 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.

SURVEILLANCE REQUIREMENTS (continued)

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. This Surveillance, coupled with placing the reactor mode switch in shutdown each refueling outage constitutes a Logic System Functional Test of the RPS. 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 2), the Functional Test is not required to be performed 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 7 day Frequency is not met. In this event, the Surveillance must be performed 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 Functions 3.a, 3.b and 4.b, a Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval.

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.

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 4 to Table 4.1.1 requires this heat balance Surveillance to be performed

SURVEILLANCE REQUIREMENTS (continued)

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 4 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.

For Trip Functions 5, 6, 7, and 8, a calibration of the trip units is required (Footnote 5) 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 8 and the time interval assumption for trip unit calibration used in the associated setpoint calculation.

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

SURVEILLANCE REQUIREMENTS (continued)

Footnote 2 to Table 4.1.1 is provided to require the APRM and IRM Surveillances to be performed 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 3 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.

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.

BASES: 3.1.B/4.1.B AVERAGE POWER RANGE MONITORS GAIN AND POWER DISTRIBUTION

SURVEILLANCE REQUIREMENTS

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

Current

Technical Specifications

Markups

3.1 and 4.1 – Reactor Protection System

And related Technical Specifications:

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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.

Specification: The RPS instrumentation for each Trip Function in Table 3.1.1 shall be operable

A. Plant operation at any power level shall be permitted in accordance with Table 3.1.1. The system response time from the opening of the sensor contact up to and including the opening of the scram solenoid relay shall not exceed 50 milliseconds. (A.2, A.3)

B.1 During operation at ≥25% Rated Thermal Power with the ratio of MFLPD to FRP greater than 1.0 either:

a. The APRM System gains shall be adjusted by the ratio given in Technical Specification 2.1.A.1.a, or

b. The power distribution shall be changed to reduce the ratio of MFLPD to FRP.

A.4

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: (RPS)

A.1 Instrumentation ~~systems~~ shall be checked, functionally tested and calibrated as indicated in Table 4.1.1 and 4.1.2, 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. Once within 12 hours after ≥25% Rated Thermal Power and once a day during operation at ≥25% Rated Thermal Power thereafter, the maximum fraction of limiting power density and fraction of rated power shall be determined and the APRM system gains shall be adjusted by the ratio given in Technical Specification 2.1.A.1.a.

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 Operation and required Actions may be delayed for up to 6 hours provided the associated Trip Function maintains RPS trip capability.

A.1

TABLE 3.1.1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT REQUIREMENTS

Applicable Modes or Other Specified Conditions

Modes in Which Functions Must be Operating

A.10

Actions Referenced from Action Note 1

Trip Function	Trip Settings	Refuel (1) A.9	Startup (12) Hot Standby M.1	Run	Required Minimum Number Operating Instrument Channels Per Trip System (2)	Required ACTIONS When Minimum Conditions For Operation Are Not Satisfied (3)
1. Mode Switch in Shutdown (5A-S1)		X	X	X	1	Note 2.a A Note 2.d L.1
2. Manual Scram (5A-S3A/B) LA.1		X	X	X	1	Note 2.a A Note 2.d
3. IRM (7-M1(A-F))						
a. High Flux	≤120/125	X	X		2	Note 2.a A Note 2.d
b. INOP		X	X		2	Note 2.a A Note 2.d L.1
4. APRM (APRM A-F) LA.1						
a. High Flux (flow bias)	≤0.66 (W-ΔW)+54% with a maximum of 120% (4) LA.5			X	2	Note 2.b A or B A.14
b. High Flux (reduced)	≤15%	X M.2	X		2	Note 2.a A
c. INOP			X	X	2 (B) LA.6	A or B M.3
5. High Reactor Pressure (PT-2-3-55(A-D)(M))	≤1055 psig	X	X	X	2	Note 2.a A
6. High Drywell Pressure (PT-5-12(A-D)(M)) LA.1	≤2.5 psig	X	X	X	2	Note 2.a A
7. Reactor Low Water Level (B) LA.7 (LT-2-3-57A/B(M)) (LT-2-3-58A/B(M)) LA.1	≥127.0 inches	X	X	X	2	Note 2.a A
8. Scram Discharge Volume High Level (LT-3-231(A-H)(M))	≤21 gallons	X	X	X	2 (per volume)	Note 2.a A Note 2.d L.1

A.1

TABLE 3.1.1
(Cont'd)

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT REQUIREMENTS

INSTRUMENTATION

Trip Function	Trip Settings And Allowable Deviations	Refuel (1)	Startup/Hot Standby	Run	Minimum Number Operating Instrument Channels Per Trip System (2)	Required ACTIONS When Minimum Conditions For Operation Are Not Satisfied (3)
		Modes in Which Functions Must be Operating				
9. Deleted	A.1	A.9			A.10	ACTIONS REFERENCED FROM ACTION NOTE 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) LA.1	≤10% valve closure			X	8 A.11	A or C NOTE 2.b L.3
10 ~~11~~. Turbine control valve fast closure (PS-(37-40)) LA.1	≥150 PSIG M.12 (10)	X A.12			2	A.14 A or D NOTE 2.c
11 ~~12~~. Turbine stop valve closure (SVOS-5-(7-4)) LA.1	≤10% valve closure (10)	X A.12			4 A.13	A or D NOTE 2.c

TABLE 3.1.1 NOTES

1. When the reactor is subcritical and the reactor water temperature is less than 212°F, only the following trip functions need to be operable:

   a) mode switch in shutdown
   b) manual scram
   c) high flux IRM or high flux SRM in coincidence
   d) scram discharge volume high water level

2. There shall be two operable or tripped trip systems for each Trip Function except as provided for below:

   (a) 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.

   (b) For each Trip Function with two or more channels less than the required minimum number of operable instrument channels:

   (1) Within one hour, verify sufficient instrument channels remain operable or tripped* to maintain trip capability in the Trip Function, and

   (2) Within 6 hours, place the inoperable instrument channel(s) in one trip system and/or that trip system** in the tripped condition*, and

   (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*.

   If any of these three conditions cannot be satisfied, initiate the ACTION required by Table 3.1.1 for the affected Trip Function.

   * 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.

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.1

TABLE 3.1.1 NOTES (Cont'd)

A.15

ACTION NOTE 2

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:

a. Initiate insertion of operable rods and complete insertion of all operable rods within four hours. (PLACE THE REACTOR IN HOT SHUTDOWN) L.2 LA.2

b. Reduce power level to IRM range and place mode switch in the "Startup/Hot Standby" position within eight hours.

c) Reduce turbine load and close main steam line isolation valves within 8 hours. L.3

c. Reduce reactor power to less than 30% of rated (RATED THERMAL POWER) within 8 hours. (OR EQUAL TO) L.4

4. "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. 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. LA.5 Table 3.1.1 Function 4.a TRIP SETTING

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.

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. M.12

10. Turbine stop valve closure and turbine control valve fast closure scram signals may be bypassed at ≤30% of reactor Rated Thermal Power. A.12 LA.8

11. Not used.

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: M.1

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.

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

VYNPS

TABLE 4.1.1

REACTOR PROTECTION SYSTEM — TESTS AND FREQUENCIES

~~SCRAM~~ INSTRUMENTATION AND LOGIC SYSTEMS FUNCTIONAL TESTS

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

Instrument Channel (TRIP FUNCTION)	Group(3)	Functional Test(4) (LA.10)	Minimum Frequency(4) (A.17)
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 (2) (M.7)	C	Trip Channel and Alarm (5) (A.19)	Before Each Startup (AND DURING EACH STARTUP) (M.8) & Weekly During Refueling (6) (A.18)
Inoperative	C	Trip Channel and Alarm	Before Each Startup & Weekly During Refueling (6) (A.18)
4. APRM			
High Flux	B	Trip Output Relays (5)	Every 3 Months
High Flux (Reduced)	B	Trip Output Relays (5)	Before Each Startup (AND DURING EACH STARTUP) (M.8) & Weekly During Refueling (5) (A.18)
Inoperative	B	Trip Output Relays (5) (A.19)	Every 3 Months
Flow Bias	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.14)	B	Trip Channel and Alarm (5)	Every 3 Months
7. Low Reactor Water Level (2) (5) (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 (L.7)	Every 3 Months
A.7 Scram Test Switch (~~5X-S2(A-D)~~) (LA.1)	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.6

(2) NOT REQUIRED TO BE PERFORMED WHEN ENTERING STARTUP/HOT STANDBY MODE FROM RUN MODE UNTIL 12 (25) HOURS AFTER ENTERING STARTUP/HOT STANDBY MODE.

Amendment No. ~~14~~, ~~21~~, ~~58~~, ~~76~~, ~~164~~, ~~186~~, 212

A.1

TABLE 4.1.1 NOTES

IRM HIGH FLUX — M.7

1. Not used

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. The automatic scram contactors shall also be exercised after maintenance on the contactors. — A.7 — LA.13

A.1 A.6

VYNPS

TABLE 4.1.~~2~~ (1)

REACTOR PROTECTION SYSTEM

~~SCRAM~~ INSTRUMENT ~~CALIBRATION~~ (ATION)

~~MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS~~

TRIP FUNCTION ~~Instrument Channel~~	~~Group~~ (1)	Calibration ~~Standard~~ (~~A~~) A.3 L.8	Minimum Frequency (~~2~~) A.17
4. High Flux APRM			
a. Output Signal	B	Heat Balance	Once Every 7 Days (4) L.10
b. Output Signal (Reduced) (~~1~~) (1)	B	~~Heat Balance~~ L.12	Once Every 7 Days (3) L.12
c. Flow Bias	~~B~~	~~Standard Pressure and Voltage Source~~	Refueling Outage
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 (~~8~~) A.20
5. High Reactor Pressure	B	~~Standard Pressure Source~~	Once/Operating Cycle M.11
10. Turbine Control Valve Fast Closure	A	~~Standard Pressure Source~~	Every 3 Months EVERY 3 MONTHS, (5)
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	(~~8~~) LA.11	Refueling Outage PRIOR TO ENTERING STARTUP/HOT STANDBY FOR PLANT STARTUP
10.a / 11.a First Stage Turbine Pressure Permissive ~~(PS-5-14(A-D))~~ LA.1	~~A~~	~~Pressure Source~~ L.8	Every 6 Months and After Refueling M.9
9. Main Steam Line Isolation Valve Closure	A	(~~8~~) LA.11	Refueling Outage

L.5

(2) NOT REQUIRED TO BE PERFORMED WHEN ENTERING STARTUP/HOT STANDBY MODE FROM RUN MODE UNTIL 12 HOURS AFTER ENTERING STARTUP/HOT STANDBY MODE L.6

3. INTERMEDIATE RANGE MONITORS (IRM)
   a. HIGH FLUX (1) — ONCE/OPERATING CYCLE (2)(3) M.10

(5) TRIP UNIT CALIBRATION ONLY M.11

(3) NEUTRON DETECTORS ARE EXCLUDED M.10 L.12

(4) NOT REQUIRED TO BE PERFORMED UNTIL 12 HOURS AFTER REACTOR POWER IS ≥ 25% OF RATED THERMAL POWER L.10

A.1

TABLE 4.1.2 NOTES

1. A description of the three groups is included in the bases of this Specification. L.5

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.

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

6. Physical inspection and actuation. LA.11

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

8. The specified frequency is met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance. A.20

A.1

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MONITORING

1.0 DEFINITIONS

Z. Surveillance Interval - The surveillance interval is the calendar time between surveillance tests, checks, calibrations, and examinations to be performed upon an instrument or component when it is required to be operable. These tests unless otherwise stated in these specifications may be waived when the instrument, component, or system is not required to be operable, but these tests shall be performed on the instrument, component, or system prior to being required to be operable.

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 thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in 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

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

A.9

Position (WITH REACTOR COOLANT TEMPERATURE ≥ 212°F)

A.1 the

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 3.2.1). The IRM flux scram setting shall be set at less than or equal to 120/125 of full scale.

A.9

/ HOT STANDBY

A.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.

E. Turbine stop valve scram shall ~~be~~ when operating at ~~greater than~~ > 30% of Rated Thermal Power, be ~~less than or equal to~~ ≤ 10% valve closure from full open.

F. Turbine control valve fast closure scram shall ~~be~~ when operating at ~~greater than~~ > 30% of Rated Thermal Power, trip upon actuation of the turbine control valve fast closure relay.

BE ≥ 150 PSIG ACCELERATION RELAY OIL PRESSURE

M.12

G. Main steam line isolation valve closure scram shall be ~~less than or equal to~~ ≤ 10% valve closure from full open.

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

Safety Assessment

Discussion of Changes

3.1 and 4.1 – Reactor Protection System

SAFETY ASSESSMENT OF CHANGES
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. 2. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative.

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 of presentation preference. 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 of presentation preference. Therefore, this change is considered administrative.

A.4 CTS 3.1.B and 4.1.B provide requirements related to Average Power Range Monitors (APRMs) gain and power distribution. These requirements are physically moved to after proposed Tables 3.1.1 and 4.1.1. The movement of the existing requirements is considered administrative. In addition, for consistency within TS, CTS 3.1.B.a is clarified to specify that gain adjustments are made in accordance with TS 2.1.A.1.a (rather than merely TS 2.1.A.1). This change in specificity is consistent with TS 4.1.B.

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, to also include reference to check requirements consistent with CTS Table 4.1.1, Note 2. This change is a presentation preference 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 presentation preference and does not alter the current requirements to periodically perform RPS instrument trip function Surveillances. Therefore, this change is considered administrative in nature.

ADMINISTRATIVE (continued)

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 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 presentation preference 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 of presentation preference. 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 ≤ 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 change 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 presentation preference and does not alter the current action requirements when required RPS channels are inoperable. Therefore, this change is considered administrative in nature.

ADMINISTRATIVE (continued)

A.11 All Main Steamline Isolation Valve Closure channels are required to be operable to assure a scram with the worst single failure. The Main Steamline 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 steamline isolation valves inputs its closure signal to each RPS trip system (trip system A and B). To ensure the interpretation that all main steamline isolation valve position switches are required to each trip system, each main steamline 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 of nomenclature and presentation preference, 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 ≤ 30% 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 ≤ 30%. 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 > 30% 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 to 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 of nomenclature and presentation preference, this change is considered administrative.

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 requirements are provided when minimum conditions for operation are not satisfied. One of these optional shutdown requirements (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 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 and 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, 10 and 11) does not alter 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 Note 2 requires an instrument check to be performed on the reactor water level and reactor pressure RPS Trip Functions once per day. Proposed Table 4.1.1 includes explicit Check requirements for 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.

ADMINISTRATIVE (continued)

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 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 the CTS definition 1.0.Z, "Surveillance Interval, " which states that these tests unless otherwise stated in these specifications may be waived when the instrument, component, or system is not required to be operable, but that these tests shall be performed on the instrument, component, or system prior to being required to be operable. Therefore, CTS Table 4.1.1 Note 4 and CTS Table 4.1.2 Note 2 are unnecessary and their deletion is considered to be 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 Intermediate Range Monitors (IRMs) High Flux and Inoperative Trip Functions and to 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 Functions 3.a and 3.b (IRM High Flux and Inop) and 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 definition 1.0.Y,"Surveillance Frequency," 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 the CTS definition of Surveillance Frequency. Therefore, the deletion of CTS Table 4.1.2 Note 8 is considered administrative.

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.

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.

M.3 For CTS Table 3.1.1, Trip Function 4, for APRM Inop, two optional shutdown requirements are provided when minimum conditions for operation are not satisfied. One of these optional shutdown requirements (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 optional shutdown requirement (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.

M.4 (not used)

TECHNICAL CHANGES - MORE RESTRICTIVE (continued)

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.

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 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.

M.7 For the IRM High Flux Trip Function, a surveillance requirement is added in proposed Table 4.1.1 to perform an Instrument Check once per day. This requirement represents an additional restriction necessary to help ensure the instrumentation is maintained operable. This requirement is consistent with the check requirement that existed in the VYNPS TS for the IRM Upscale Control Rod Block Function prior to its relocation by Amendment No. 211. The addition of the check requirement for this RPS Trip Function is consistent with the ISTS.

M.8 For the IRM High Flux Trip Function, the IRM Inop Trip Function, and 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 these Trip Functions 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 these Trip Functions is "Every 7 Days During Each STARTUP/HOT STANDBY." This additional restriction ensures that the instrumentation is maintained operable in the Mode of applicability. The change is consistent with the ISTS.

TECHNICAL CHANGES - MORE RESTRICTIVE (continued)

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.

M.10 The current VYNPS TS do not include a Calibration requirement for the IRM High Flux Trip Function. However, a Trip Setting is specified for this Trip Function. The "Once/Operating Cycle" Frequency specified for the Calibration of the IRM High Flux Trip Function is based on the assumption of an 18 month + 25% calibration interval in the determination of the magnitude of equipment drift in the associated setpoint calculation. Providing a Calibration requirement for the IRM High Flux Trip Function represents an additional restriction on plant operation to ensure the instrumentation is maintained operable. The Calibration requirement is modified by two footnotes (Footnotes 2 and 3). Footnote 2 allows performance of the Calibration requirement to be delayed until 12 hours after entering Startup/Hot Standby from Run. The IRM Trip Function is required in Startup/Hot Standby, but not in Run, and the required Surveillance 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. Footnote 3 excludes neutron detectors from the calibration since they are passive devices, with minimal drift, and because of the difficulty in simulating a meaningful signal. The addition of the Calibration requirement, as modified by the added footnotes, for this instrumentation is consistent with the ISTS.

M.11 CTS Table 4.1.2 does not include explicit requirements to calibrate trip units. Proposed Table 4.1.1 requires calibration of the trip units of the following 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.

M.12 The Trip Setting for the Turbine Control Valve Fast Closure Trip Function is specified in CTS Table 3.1.1 Note 9 as "Channel signals for the turbine control valve fast closure scram shall be derived from the same event or events that cause the control valve fast closure," and CTS 2.1.F as, "Turbine control valve fast closure scram shall ... trip upon actuation of the turbine control valve fast closure relay." In proposed Table 3.1.1 (Trip Function 10) and TS 2.1.F, the Trip Setting is specified as $\geq$ 150 psig acceleration relay oil pressure. This revised Trip Setting is based on ensuring equipment operability limits. The actual operating

TECHNICAL CHANGES - MORE RESTRICTIVE

M.12 (continued) point for the associated trip function is not assumed in any transient or accident analysis. This change (i.e., including the specific numerical value of the Trip Setting in the TS) represents an additional restriction on plant operation necessary to ensure that equipment operability is maintained.

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 CTS Table 3.1.1 Note 2 contains design and operational details of the RPS 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 RPS instrumentation. 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 the associated Surveillance Requirements for the RPS 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.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

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 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 Setting 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 3.1.1, 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.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

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 ≤ 30% of reactor Rated Thermal Power. The design of these Trip Functions is that they are automatically bypassed when reactor power is ≤ 30% 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 CTS Table 4.1.1 and associated Note 7 describe details of the performance of Instrument Functional Tests of the RPS Trip Functions. These details are to be relocated to Bases. These details are not necessary to ensure the operability of the RPS instrumentation. The VYNPS TS definition of Instrument Functional Tests, the requirements of proposed Specification 3.1.A, and the associated Surveillance Requirements (including the requirements to periodically perform Instrument Functional Tests) are adequate to ensure the RPS instrumentation 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.

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.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

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 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 change 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 (2)). 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 otherwise remain inserted, the RPS Trip Functions serve no purpose and are not required. In this condition the required Shutdown Margin and the required one-rod-out interlock ensure no event requiring RPS will occur. This is consistent with the ISTS.

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. 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

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 (continued) 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. 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 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 Shutdown Margin requirements and the required one-rod-out interlock ensure no event occurs which would require the RPS scram function to mitigate reactivity excursions. The Actions for inoperable equipment in Refuel with reactor water temperature less than or equal 212°F are also revised to be consistent with the proposed applicability. 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. This is consistent with the ISTS.

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...." 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. This is consistent with the ISTS.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.2 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 Hot Shutdown within 12 hours. The 12 hour Completion Time is considered reasonable, based on operating experience, to reach Hot Shutdown and is consistent with the ISTS. Allowing 12 hours to reach Hot Shutdown is an acceptable exchange in risk; the risk of an event during the time period to reach Hot Shutdown, versus the potential 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 inserting within four hours).

L.3 CTS Table 3.1.1, for the Main Steamline Isolation Valve 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 Steamline 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 Steamline 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 Steamline Isolation Valve Closure Trip Function is no longer required to be operable. This is consistent with the ISTS. 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 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 30% of rated. 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 $\leq$ 30% 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 $\leq$ 30% (i.e., the applicability of these Trip Functions is when reactor power is greater than 30%). Therefore, proposed Table 3.1.1 ACTION Note 2.c is relaxed to require reducing reactor power to $\leq$ 30% 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 is consistent with the ISTS.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.5 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 the groups for each of the RPS Trip Function scram sensors. 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. Therefore, information on groups for RPS Trip Functions is deleted and is not included in proposed Table 4.1.1. Proposed Table 4.1.1 adequately describes the Frequencies of the Functional Tests and Calibration without the need to refer to groups. This change is consistent with the ISTS.

L.6 Footnote 2 to Table 4.1.1 is added to exempt the Functional Test and Calibration requirements until 12 hours after entering Startup/Hot Standby from Run. The IRM Trip Functions and APRM High Flux (Reduced) Trip Function are 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 SRs after entering the applicable Mode. This Frequency is consistent with the ISTS.

L.7 CTS Table 4.1.1 requires performing a Functional Test on alarms of certain RPS Trip Functions. RPS Trip Function alarms are not credited in any accident or transient analysis, and therefore the proposed Table 4.1.1 Functional Test requirement does not include RPS Trip Function alarms. 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. This change is consistent with ISTS.

L.8 CTS Table 4.1.2 lists calibration standards to be used when performing Calibrations of RPS Trip Functions. These details 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. As such, listed calibration standards are not required and are deleted. This change is consistent with the ISTS.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.9 (not used)

L.10 A Note 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 (4)) that states the Surveillance is not required to be performed until 12 hours after reactor power ≥ 25% Rated Thermal Power. This is allowed because it is difficult to accurately determine core Thermal Power from a heat balance < 25% 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 25% 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. The change is consistent with the ISTS.

L.11 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). 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. 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 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. This requirement is deleted and replaced with the requirement to perform an Instrument Calibration at the same Frequency. Proposed Table 4.1.1 Trip Function 4.b requires an Instrument Calibration to be performed once per 7 days. 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 < 25% Rated Thermal Power, it is difficult to accurately determine core Thermal Power from a heat balance. 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. Therefore, replacing the heat balance calibration requirement for the APRM High Flux (Reduced) Trip Function with an Instrument Calibration provides adequate assurance that the RPS Trip Function will be capable of satisfying its required function. In addition, the Calibration requirement is modified by a footnote (Footnote (3)) that excludes neutron detectors from the calibration since they are passive devices, with minimal drift, and because of the difficulty in simulating a meaningful signal. The change,

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.12 (continued) including the modification of the Calibration requirement by the added footnote, is consistent with the ISTS.

RELOCATED SPECIFICATIONS

None

No Significant Hazards Consideration

3.1 and 4.1 – Reactor Protection System

GENERIC NO SIGNIFICANT HAZARDS CONSIDERATION

ADMINISTRATIVE CHANGES
("A.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change involves reformatting, renumbering, and rewording. The reformatting, renumbering, and rewording process involves no technical changes to the existing Technical Specifications. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in methods governing normal plant operation. The proposed change will not impose any new or eliminate any old requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change will not reduce a margin of safety because it has no impact on any safety analyses assumptions. This change is administrative in nature. Therefore, the change does not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - MORE RESTRICTIVE
("M.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change provides more stringent requirements for operation of the facility. These more stringent requirements do not result in operation that will increase the probability of initiating an analyzed event and do not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements continue to ensure process variables, structures, systems, and components are maintained consistent with the safety analyses and licensing basis. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in the methods governing normal plant operation. The proposed change does impose different requirements. However, these changes are consistent with the assumptions in the safety analyses and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The imposition of more restrictive requirements either has no impact on or increases the margin of plant safety. As provided in the discussion of the change, each change in this category is by definition, providing additional restrictions to enhance plant safety. The change maintains requirements within the safety analyses and licensing basis. Therefore, this change does not involve a significant reduction in a margin of safety.

"GENERIC" LESS RESTRICTIVE CHANGES:
RELOCATING DETAILS TO TECHNICAL SPECIFICATION BASES, UFSAR, PROCEDURES, OR OTHER PLANT CONTROLLED DOCUMENTS
("LA.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change relocates certain details from the Technical Specifications to the Bases, UFSAR, procedures, or other plant controlled documents. The Bases, UFSAR, procedures, and other plant controlled documents containing the relocated information will be maintained in accordance with 10 CFR 50.59. The UFSAR is subject to the change control provisions of 10 CFR 50.71(e), and the plant procedures and other plant controlled documents are subject to controls imposed by plant administrative procedures, which endorse applicable regulations and standards. Since any changes to the relocated details in the Bases, UFSAR, procedures, or other plant controlled documents will be evaluated per the requirements of 10 CFR 50.59, no significant increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change will not impose or eliminate any requirements, and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the details to be transposed from the Technical Specifications to the Bases, UFSAR, procedures, or other plant controlled documents are the same as the existing Technical Specifications. Since any future changes to these details in the Bases, UFSAR, procedures, or other plant controlled documents will be evaluated per the requirements of 10 CFR 50.59, no significant reduction in a margin of safety will be allowed. Based on 10 CFR 50.92, the existing requirement for NRC review and approval of revisions, to these details proposed for relocation, does not have a specific margin of safety upon which to evaluate. However, since the proposed change is consistent with the BWR Standard Technical Specifications, NUREG-1433, approved by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail ensures no significant reduction in the margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
TS 3.1/4.1 – REACTOR PROTECTION SYSTEM INSTRUMENTATION

L.1 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change removes requirements for operability of the Reactor Mode Switch Shutdown Position, Manual Scram, Intermediate Range Monitors High Flux, and Scram Discharge Volume High Water Level Reactor Protection System (RPS) Trip Functions to only require the associated RPS Trip Functions to be operable in Refuel when a control rod is withdrawn from a core cell containing fuel assemblies. These RPS Trip Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Control rod withdrawal from or insertion into core cells without fuel assemblies does not significantly affect core reactivity and therefore, the RPS scram function in this condition serves no purpose. As a result, this change does not involve a significant increase in the consequences of an accident previously evaluated.

   The proposed change provides an Action to immediately initiate action and continue attempts to insert all insertable control rods. The RPS instrumentation and requirements to fully insert all insertable control rods immediately during Refuel if required RPS instrumentation is not operable are not assumed in the initiation of any previously analyzed accident. As such, the proposed change to the Actions will not increase the probability of any accident previously evaluated. The change potentially extends the time period to insert all insertable control rods by providing an Action to immediately initiate action and continue attempts to insert all insertable control rods. The consequences of an event occurring under the proposed action are the same as the consequences of an event occurring under the current action. Therefore, this change does not involve an increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures the affected RPS instrumentation is required to be operable when it is necessary to perform its function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change does not affect the safety analysis assumptions, thus no question of safety exists. This change will continue to require that the safety function of the associated RPS Trip Functions is satisfied when required. Therefore, this change does not involve a significant reduction in a margin of safety.

L.2 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change extends the time, when Reactor Protection System (RPS) Trip Functions do not meet minimum requirements, to insert operable control rods (i.e., reach Hot Shutdown). The time is extended from immediately initiate insertion of operable control rods and complete insertion within 4 hours to place the reactor in Hot Shutdown within 12 hours. This change does not result in any hardware or operating procedure changes. The RPS Instrumentation is not assumed to be an initiator of any analyzed event. Additionally, the consequences of an event occurring while the unit is decreasing power and shutting down during the extra time are the same as the consequences of an event occurring for the current shutdown time. Therefore, the change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The increased time allowed for reaching the applicable condition with inoperable RPS Trip Functions is acceptable based on the small probability of an event requiring the inoperable channels to function and the minimization of plant transients. Any reduction in a margin of safety is insignificant and offset by the benefit gained from providing sufficient time to reach the applicable condition, thus avoiding potential plant transients from attempting to reach the applicable condition in the current period of time. Therefore, this change does not involve a significant reduction in a margin of safety.

L.3 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change relaxes the shutdown action to be consistent with exiting the applicable Mode when the Main Steamline Isolation Valve Closure Reactor Protection System (RPS) Trip Function does not meet minimum requirements. The affected RPS Trip Function is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this Trip Function is not credited for mitigation of any analyzed accident or transient. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that continued operation in the applicable Mode is not allowed when the associated RPS Trip Function is not capable of performing its required safety function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   Revising the action to require placing the reactor in Startup/Hot Standby, when the Main Steamline Isolation Valve Closure RPS Trip Function does not meet minimum requirements, ensures that the reactor is placed in a Mode in which the affected RPS Trip Function is not required to perform any safety function. The Main Steamline Isolation Valve Closure RPS Trip Function is not credited for mitigation of any analyzed accident or transient. Therefore, this change does not involve a significant reduction in a margin of safety.

L.4 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change relaxes the action to reduce power to be consistent with exiting the applicable Mode (i.e., when reactor power is equal to 30% of Rated Thermal Power) when the Turbine Control Valve Fast Closure or Turbine Stop Valve Closure Reactor Protection System (RPS) Trip Function does not meet minimum requirements. The affected RPS Trip Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, these Trip Functions are not credited for mitigation of any accident or transient when reactor power is equal to 30% of Rated Thermal Power. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that continued operation in the applicable condition is not allowed when an associated RPS Trip Function is not capable of performing its required safety function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   Revising the action to require reducing reactor power to 30% of Rated Thermal Power, when the Turbine Control Valve Fast Closure or Turbine Stop Valve Closure RPS Trip Function does not meet minimum requirements, ensures that the reactor is placed in a condition in which the affected RPS Trip Function is not required to perform any safety function. The Turbine Control Valve Fast Closure and Turbine Stop Valve Closure RPS Trip Functions are not required to be operable when reactor power is equal to 30% of Rated Thermal Power. Therefore, this change does not involve a significant reduction in a margin of safety.

L.5 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change deletes design information related the groups for each of the Reactor Protection System (RPS) Trip Function scram sensors. The RPS Trip Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. In addition, the Surveillance Requirements and their associated Frequencies in Technical Specifications are sufficient to ensure that RPS Trip Functions continue to be demonstrated capable of mitigating the consequences of previously analyzed accidents and transients without the need to reference design information related to scram sensor groups. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures the RPS Trip Functions are required to be demonstrated capable of performing their functions as described in the Technical Specifications. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The deletion of design information related the groups for each of the RPS Trip Function scram sensors does not involve a significant reduction in a margin of safety. Information is no longer used or necessary for this purpose. The demonstration of RPS Trip Function operability will continue to be required as specified in the Technical Specifications. Therefore, this change does not involve a significant reduction in a margin of safety.

L.6 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change allows entry into Startup/Hot Standby from Run and provides time after entry to perform the required surveillances on the Intermediate Range Monitor (IRM) and Average Power Range Monitor (APRM) Reactor Protection System (RPS) Trip Functions. The IRMs and APRMs RPS Trip Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. This change does not impact the capability of the affected RPS Trip Functions to perform their required function, but continues to provide for confirmation of the capability of the affected RPS Trip Functions as soon a practical, when required. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still requires the IRM and APRM RPS Trip Functions to be operable prior to entry into Startup/Hot Standby from Run. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change does not involve a significant reduction in a margin of safety since most surveillances only confirm the capability of the components to perform their function. Performance of the surveillances prior to entry into the applicable conditions requires utilizing jumpers and lifting of leads that poses a greater risk of error that could result in a plant transient. The additional time to perform the Surveillance is consistent with the frequency provided in the BWR Standard Technical Specifications, NUREG-1433, which has been previously approved by the NRC. Therefore, this change does not involve a significant reduction in a margin of safety.

L.7 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change deletes the requirement to perform a Functional Test on alarms of certain Reactor Protection System (RPS) Trip Functions. RPS Trip Function alarms are not credited in any accident or transient analysis. The RPS Instrumentation is not assumed to be an initiator of any analyzed event. The consequences of an accident will not be increased because the RPS Trip Function alarms are not credited in any accident or transient analysis. Therefore, the change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still provides adequate assurance the RPS Trip Functions remain capable of performing their functions, as assumed in the safety analyses. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change does not involve a significant reduction in a margin of safety because the RPS Trip Function alarms are not credited in any accident or transient analysis. The change does not affect the current analysis assumptions and adequate assurance continues to be provided that the RPS Trip Functions will be maintained operable. Therefore, this change does not involve a significant reduction in a margin of safety.

L.8 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change deletes the details of calibration standards to be used when performing Calibrations of Reactor Protection System (RPS) Trip Functions. This change does not result in any hardware or operating procedure changes. The RPS instrumentation is not assumed to be an initiator of any analyzed event. The Technical Specification definition of Instrument Calibration, the requirements of associated RPS Technical Specifications Surveillance Requirements (including the requirements to periodically perform Instrument Calibrations) are adequate, without the deleted details, to ensure the RPS Trip Functions are maintained operable to mitigate the consequences of transients and accidents as assumed in the safety analysis. As such, the safety function assumed in the safety analysis for the RPS instrumentation will continue to be demonstrated as required by the Technical Specification Surveillances. Therefore, the change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still provides adequate assurance the RPS Trip Functions remain capable of performing their functions, as assumed in the safety analyses. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The deletion of details of calibration standards to be used when performing Calibrations of RPS Trip Functions does not involve a significant reduction in a margin of safety. The demonstration of RPS Trip Function operability will continue to be required as specified in the Technical Specifications. Therefore, this change does not involve a significant reduction in a margin of safety.

L.9 CHANGE

(not used)

L.10 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The change effectively extends the initial Surveillance Frequency for performance of a heat balance Calibration until 12 hours after Thermal Power is ≥ 25% Rated Thermal Power. The change does not involve a hardware change. The affected Average Power Range Monitor (APRM) Reactor Protection System (RPS) Trip Function is not assumed in the initiation of any analyzed event. The role of this RPS Trip Function is in mitigating and, thereby, limiting the consequences of analyzed events. This change does not impact the capability of this RPS Trip Function to perform its required function, but continues to provide for confirmation of the capability of the system as soon a practical. At low power levels (< 25% Rated Thermal Power), a high degree of accuracy between the APRM indication and actual core Thermal Power is unnecessary due to the large inherent margin to the thermal limits at these power levels. As a result, the consequences of an accident are not affected by this change. This change will not alter assumptions relative to the mitigation of an accident or transient event. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still requires the affected APRM RPS Trip Function to be operable when required. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The margin of safety is not reduced by this change since the change to the Surveillance Frequency provides the necessary assurance that the affected APRM RPS Trip Function is accurately calibrated at the earliest opportunity. This change provides the benefit of allowing the Surveillance to be postponed until appropriate plant conditions exist for performing the Surveillance accurately since performing this Surveillance below 25% Rated Thermal Power does not adequately verify APRM RPS Trip Function operability. The safety analysis assumptions are still maintained, thus no question of safety exists. Therefore, this change does not involve a significant reduction in a margin of safety.

L.11 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The change relaxes the requirement for the Reactor Protection System (RPS) Trip Functions in Refuel. Currently, in Refuel with reactor water temperature less than 212°F, RPS Trip Function requirements are reduced to only require the Reactor Mode Switch in Shutdown Position Trip Function, Manual Scram Trip Function, Intermediate Range Monitor (IRM) High Flux Trip Function, and the Scram Discharge Volume High Water Level Trip Function to be operable. This Refuel requirement is relaxed such that when reactor water temperature is less than or equal to 212°F only 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 are required to be operable. The RPS Trip Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. 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. The change does not affect the ability of the RPS Trip Functions to perform their safety functions when required. As such, the RPS Trip Functions will still be capable of mitigating the consequences of analyzed accidents and transients as assumed in the safety analysis. Therefore, this change will not involve a significant increase in the consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that the associated RPS Trip Functions are operable when required. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change does not involve a significant reduction in a margin of safety since the RPS Trip Functions are not credited for mitigation of any accident or transient in Refuel when the reactor water temperature is less than or equal to 212°F. As such, revising the applicability to only require these RPS Trip Functions to be operable in Refuel when reactor water temperature is equal to 212°F, as well as less than 212°F, has not adverse impact on plant safety. Therefore, this change does not involve a significant reduction in a margin of safety.

L.12 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The change deletes the requirement for the performance of a heat balance calibration of the Average Power Range Monitor (APRM) High Flux (Reduced) Reactor Protection System (RPS) Trip Function and replaces it with a requirement to perform an Instrument Calibration. This RPS Trip Function is not considered as an initiator for any accidents previously analyzed. Replacing the heat balance calibration requirement for the APRM High Flux (Reduced) Trip Function with an Instrument Calibration provides adequate assurance that the RPS Trip Function will be capable of satisfying its required function. In addition, the Technical Specification definition of Instrument Calibration and the proposed Instrument Calibration Surveillance Requirement will continue to ensure the APRM High Flux (Reduced) Trip Function is maintained operable. Therefore, this change will not involve a significant increase in the consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still provides adequate assurance the APRM High Flux (Reduced) Trip Function remains capable of performing its function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change does not involve a significant reduction in a margin of safety since the performance of the heat balance calibration of the APRM High Flux (Reduced) Trip Function is not required to ensure the operability of this RPS Trip Function in the Startup/Hot Standby or Refuel Modes. The Technical Specification definition of Instrument Calibration and the Instrument Calibration Surveillance Requirement will continue to ensure the APRM High Flux (Reduced) Trip Function is demonstrated and maintained operable. The safety analysis assumptions are still maintained, thus no question of safety exists. Therefore, this change does not involve a significant reduction in a margin of safety.

References

3.1 and 4.1 – Reactor Protection System

REFERENCES
3.1 and 4.1 – Reactor Protection System

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.

Proposed

Technical Specifications

3.2.A and 4.2.A
Emergency Core Cooling 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(1)	2	Note 1	≤ 2.5 psig
b. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	2	Note 1	≥ 82.5 inches
c. Low Reactor Pressure (Initiation)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	≥ 300 psig and ≤ 350 psig
d. Low Reactor Pressure (System Ready and Valve Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	2	Note 2	≥ 300 psig and ≤ 350 psig
e. Pump Start Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	≥ 8 seconds and ≤ 10 seconds
f. Pump Discharge Pressure	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2 per pump	Note 8	≥ 100 psig
g. Auxiliary Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	NA
h. Pump Bus Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	NA

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

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

(3) 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(1), (2)	1	Note 2	≥ 300 psig and ≤ 350 psig
b. High Drywell Pressure (Initiation)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1)	2	Note 1	≤ 2.5 psig
c. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	2	Note 1	≥ 82.5 inches
d. Reactor Vessel Shroud Level	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1)	1	Note 3	≥ 2/3 core height
e. LPCI B and C Pump Start Time Delay	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	≥ 3 seconds and ≤ 5 seconds
f. RHR Pump Discharge Pressure	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2 per pump	Note 8	≥ 100 psig
g. High Drywell Pressure (Containment Spray Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1)	2	Note 3	≤ 2.5 psig
h. Low Reactor Pressure (System Ready and Valve Permissive)	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	2	Note 2	≥ 300 psig and ≤ 350 psig

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

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

(3) 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(1), (2)	1	Note 2	NA
j. Pump Bus Power Monitor	RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN, REFUEL(1), (2)	1	Note 2	NA
3. High Pressure Coolant Injection (HPCI) System				
a. Low-Low Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 4	≥ 82.5 inches
b. Low Condensate Storage Tank Water Level	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 5	≥ 4.24%(4)
c. High Drywell Pressure	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 4	≤ 2.5 psig
d. High Reactor Vessel Water Level	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 6	≤ 177 inches

(1) With reactor coolant temperature > 212 °F.
(2) When associated ECCS subsystem is required to be operable.
(3) With reactor steam pressure > 150 psig.
(4) 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(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 7	≥ 82.5 inches
b. High Drywell Pressure	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 7	≤ 2.5 psig
c. Time Delay	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	1	Note 8	≤ 120 seconds
d. Sustained Low-Low Reactor Vessel Water Level Time Delay	RUN, STARTUP/HOT STANDBY(3), HOT SHUTDOWN(3), REFUEL(3)	2	Note 8	≤ 8 minutes

(3) 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 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 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. Restore inoperable channel to operable status within 24 hours.

   If any applicable Action and associated completion time of Note 3.a or 3.b 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 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 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 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 inoperable channel in trip within 96 hours from discovery of the inoperable channel concurrent with HPCI System or RCIC System inoperable, and
   c. Place 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 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 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(1), Once/Operating Cycle
b. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
c. Low Reactor Pressure (Initiation)	NA	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
d. Low Reactor Pressure (System Ready and Valve Permissive)	NA	Every 3 Months	Every 3 Months(1), 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(1), Once/Operating Cycle
b. High Drywell Pressure (Initiation)	Once/Day	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
c. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
d. Reactor Vessel Shroud Level	NA	Every 3 Months	Every 3 Months(1), 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(1), Once/Operating Cycle

(1) 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(1), 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(1), 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(1), Once/Operating Cycle
d. High Reactor Vessel Water Level	NA	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
4. Automatic Depressurization System (ADS)			
a. Low-Low Reactor Vessel Water Level	Once/Day	Every 3 Months	Every 3 Months(1), Once/Operating Cycle
b. High Drywell Pressure	Once/Day	Every 3 Months	Every 3 Months(1), 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

(1) Trip unit calibration only.

Proposed

Bases

3.2.A and 4.2.A

Emergency Core Cooling 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 (1), (2), and (3) 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 the RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and REFUEL (with reactor coolant temperature > 212°F) Modes 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 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 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 analysis. Low Reactor Pressure (System Ready and Valve Permissive) is one of the Trip Functions assumed to be operable and capable of permitting initiation

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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 the RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and REFUEL (with reactor coolant temperature > 212°F) Modes. 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. This Trip Function may be overridden during accident conditions as allowed by plant procedures. 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 the RUN, STARTUP/HOT STANDBY, HOT SHUTDOWN and REFUEL (with reactor coolant temperature > 212°F) Modes 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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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 redundant 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). Redundant automatic initiation capability is lost if either (a) one Trip Function 1.c channel inoperable in each trip system, (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) one Trip Function 2.a channel inoperable in each trip system, (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

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

ACTIONS (continued)

inoperable channel would only require the affected portion of the associated system of low pressure 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 redundant 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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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 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 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 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

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ACTIONS (continued)

inoperabilities. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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

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ACTIONS (continued)

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 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.

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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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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 "time zero" for beginning the 8 day "clock" 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.

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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. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." 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 "time zero" for beginning the 8 day "clock" 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 (1)) 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.

Current

Technical Specifications

Markups

3.2.A and 4.2.A

Emergency Core Cooling System

A.1

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:

(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.

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.

The ECCS instrumentation for each Trip Function in 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:

(ECCS)

A. Emergency Core Cooling System

1. ECCS Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.1. A.3 checked A.4

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B. Primary Containment Isolation

Instrumentation and logic systems shall be functionally tested and calibrated as indicated in Table 4.2.2.

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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 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. A.5

A.1

TABLE 3.2.1

EMERGENCY CORE COOLING SYSTEM ~~ACTUATION~~ INSTRUMENTATION

Actions when Required Channels are Inoperable

LA.2

Core Spray - ~~A & B (Note 1)~~

	Minimum Number of Operable Instrument Channels per Trip System	A.5	Trip Function	Trip ~~Level~~ Setting (A.1)	~~Required ACTION When Minimum Conditions For Operation Are Not Satisfied~~
1.a	2	~~(Note 8)~~	High Drywell Pressure ~~(PT-10-101 (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 ~~13~~ 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 ~~13~~ 2
1.e	1	(Note ~~8~~ 8) (M.1)	Pump Start Time Delay ~~(14A-K16A & B)~~	8 ≤ t ≤ 10 seconds	Note ~~12~~ 2
1.f	2	~~(Note 8)~~	Pump ~~(P-46-1A/B)~~ Discharge Pressure ~~(PS-14-44 (A-D))~~	≥100 psig	Note ~~10~~ 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)

TABLE 3.2.1
(Cont'd)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

Actions when Required Channels are Inoperable

LA.2

Low Pressure Coolant Injection System (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.a	1 (Note 8)	Low Reactor Pressure (PT-2-3-56C/D(M))	300 ≤ p ≤ 350 psig	Note 2
2.b	2 (Note 8)	High Drywell Pressure (PT-10-101(A-D)(M))	≤2.5 psig	Note 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	Note 1
2.d	1 (Note 8)	Reactor Vessel Shroud Level (LT-2-3-73A/B(M))	≥2/3 core height	Note 3
	1 (Note 9)	Time Delay (10A-K72A & B)	≤60 seconds	Note 12
2.e	1 (Note 8)	Pump Start Time Delay (10A-K50A & B)	3 ≤ t ≤ 5 seconds	Note 2
	1 (Note 9)	Low Reactor Pressure (PS-2-128A & B)	100 ≤ p ≤ 150 psig	Note 10
2.f	2 per pump (Note 8)	RHR Pump (A-D) Discharge Pressure (PS-10-105(A-H))	≥100 psig	Note 8
2.g	2 (Note 8)	High Drywell Pressure (PT-10-101(A-D)(S1))	≤2.5 psig	Note 3

A.1 A.5 LA.1 LA.3 M.1 R.1 A.8

A.1

TABLE 3.2.1
(Cont'd)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

Actions when Required Channels are Inoperable

LA.2

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)	Required ACTION When Minimum Conditions For Operation Are Not Satisfied	
2.h	1	(Note 9)	Time Delay (10A-K45A & B)	≤6 minutes	Note 12	R.2
	2	(Note 8)	Low Reactor Pressure (PT-2-3-56A/B(M) & PT-2-3-52C/D(M))	300 ≤ p ≤ 350 psig	Note 11	2
2.i	1	(Note 8)	Auxiliary Power Monitor (LNPX C/D)	--	Note 10	2
2.j	1	(Note 8)	Pump Bus Power Monitor (27/3A/B, 27/4A/B)	--	Note 10	2
	1		Trip System Logic	--	Note 8	L.5

LA.1

A.1

TABLE 3.2.1
(Cont'd)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

Actions when Required Channels are Inoperable

High Pressure Coolant Injection System

	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 4
3.b	2	(Notes 4)	8)	Low Condensate Storage Tank Water Level LSL-107-5A/B	≥ 3% 4.24% (4) M.6	Note 5
3.c	2	(Notes 3)	8)	High Drywell Pressure PT-10-101(A-D)(M) LA.1	Same as LPCI ≤ 2.5 psig A.1	Note 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 6

A.5 L.5 LA.4

(4) PERCENT OF INSTRUMENT SPAN.

TABLE 3.2.1
(Cont'd)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

	Automatic Depressurization				
	Minimum Number of Operable Instrument Channels per Trip System (Notes 4)		Trip Function	Trip Level Setting	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	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)	≤120 seconds	Note 18 8
	2		Trip System Logic	--	Note 6
4.d	2	(Note 8)	Time Delay (2E-K16A/B, 2E-K17A/B)	≤8 minutes	Note 18 8

A.1 LA.4 A.1 A.1 LA.1 L.5 L.5 A.5 L.5

A.1

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

TABLE 3.2.1 ~~NOTES~~ ACTION

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. LA.4

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

1. ~~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(s) declare the associated systems inoperable, and (both) L.2

   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.

2. ~~11~~. With one or more channels inoperable for injection permissive and/or recirculation discharge valve permissive (or power monitors) M.2

   A. Within one hour from discovery of loss of initiation capability for feature(s) in one division(s) declare the associated systems inoperable, and (both) L.2

   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.

TABLE 3.2.1 NOTES (Cont'd)

2. With one or more actuation timer 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.

3. With one or more channels inoperable for Containment Spray:

   A. Within one hour from discovery of loss of LPCI System initiation capability, declare the LPCI System inoperable, and
   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 inoperable.

4. With one or more channels inoperable for HPCI:

   A. Within one hour from discovery of loss of 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.

5. With one or more channels inoperable for HPCI:

   A. Within one hour from discovery of loss of 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.

6. With one or more channels inoperable for HPCI:

   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.

7. 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, 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.

TABLE 3.2.1 ACTION NOTES (Cont'd)

8. 18. With one or more channels inoperable for ADS:

A. Within one hour from discovery of loss of ADS initiation capability in both one trip systems L.2 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

TABLE 4.2.1

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

SYSTEM

Core Spray System

	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	--
1.d	Low Reactor Pressure (PT-2-3-56A/B(M) & 62C/D(M)) LA.1	Every Three Months	Once/Operating Cycle	--
1.f	Pump (P-46-1A/B) Discharge Pressure	Every Three Months	Every Three Months	--
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
SR4.2.A.2	Trip System Logic	Once/Operating Cycle	Once/Operating Cycle (Note 3)	-- A.3
1.e	Pump Start Time Delay			A.11

Every 3 Months (1) M.5

(1) Trip unit calibration only M.5

A.1

TABLE 4.2.1
(Cont'd)

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION SYSTEM INSTRUMENTATION

Low Pressure Coolant Injection System

	Trip Function	Functional Test (8) A.10	Calibration (8) A.10	Instrument Check
2.a	Low Reactor Pressure (PT-2-3-56C/D(M)) LA.1	Every Three Months	Once/Operating Cycle	--
2.b	High Drywell Pressure (PT-10-101A-D(M)) LA.1	Every Three Months	Once/Operating Cycle Every 3 Months (1) M.5	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	--
	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	--
2.g	High Drywell Pressure (PT-10-101A-D(SI)) LA.1	Every Three Months	Once/Operating Cycle Every 3 Months (1) M.5	--
2.h	Low Reactor Pressure (PT-2-3-56A/B)(M) & 52C/D(M)) LA.1	Every Three Months	Once/Operating Cycle	--
2.i	Auxiliary Power Monitor	Every Three Months	None	Once Each Day
2.j	Pump Bus Power Monitor	Every Three Months	None	Once Each Day
SR4.2.A.2	Trip System Logic	Once/Operating Cycle	Once/Operating Cycle (Note 3)	-- A.3
2.e	LPCI B and C Pump Start Time Delay			A.11

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(1) Trip unit calibration only M.5

A.1

TABLE 4.2.1
(Cont'd)

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

SYSTEM

	High Pressure Coolant Injection System			
	Trip Function	Functional Test (8) A.10	Calibration (8) A.10	Instrument Check
3.a	Low-Low Reactor Vessel Water Level	Every Three Months	Once/operating cycle	Once each day
3.b	Low Condensate Storage Tank Water Level	Every Three Months	Every three months	--
3.c	High Drywell Pressure	Every Three Months	Once/operating cycle	Once each day
SR4.2.A.2	Trip System Logic	Once/operating cycle	~~Once/Operating cycle (Note 3)~~ A.12	-- A.3
3.d	High Reactor Vessel Water Level	Every Three Months	Once/operating cycle	--

Every 3 Months (1), M.5

Every 3 Months (1), M.5

(1) Trip unit calibration only M.5

A.1

TABLE 4.2.1
(Cont'd)

MINIMUM TESTS AND CALIBRATION FREQUENCIES

EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION

SYSTEM

	Automatic Depressurization System			
	Trip Function	Functional Test (8) A.10	Calibration (8) A.10	Instrument Check
4.a	Low-Low Reactor Vessel Water Level	Every Three Months	Once/Operating Cycle	Once Each Day
4.b	High Drywell Pressure	Every Three Months	Once/Operating Cycle	Once Each Day
SR4.2.A.2	Trip System Logic (Except Solenoids of Valves) LA.5	Once/Operating Cycle (Notes 2 and 11) LA.5	Once/Operating Cycle (Note 3)	-- A.3
4.c	Time Delay			
4.d	Sustained Low-Low Reactor Vessel Water Level Time Delay			

Every 3 Months (1) M.5

A.11

(1) Trip unit calibration only. M.5

A.1

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

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.

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

Safety Assessment

Discussion of Changes

3.2.A and 4.2.A

Emergency Core Cooling 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. 2. These format and presentation changes are being made to improve usability and clarity. The changes are considered administrative.

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 changes L.1 and L.4 below. Therefore, this change does not involve a technical change, but is only a difference of presentation preference 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 in both proposed and CTS Tables 3.2.1 and 4.2.1. It is not necessary to explicitly identify logic systems in CTS 4.2.A, since proposed SR 4.2.A.2 (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 presentation preference 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 of presentation preference. Therefore, this change is considered administrative.

ADMINISTRATIVE (continued)

A.6 The CTS Table 3.2.1 Note 5 (proposed Table 3.2.1 ACTION Note 9) 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.

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 are physically moved to proposed Tables 3.2.7 and 4.2.7. The movement of the existing requirements is considered administrative and is consistent with the ISTS.

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 the CTS definition 1.0.Z, "Surveillance Interval," which states that these tests unless otherwise stated in these specifications may be waived when the instrument, component, or system is not required to be operable, but that these tests shall be performed on the instrument, component, or system prior to being required to be operable. Therefore, CTS Table 4.2 Note 8 is unnecessary and its deletion is considered to be administrative. The change is consistent with the ISTS.

ADMINISTRATIVE (continued)

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 does not involve a technical change, but is only a difference of presentation preference 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 does not involve a technical change, but is only a difference of presentation preference and is considered administrative.

A.13 CTS Table 4.2 Note 4 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. Therefore, the requirements of CTS Table 4.2 Note 4 are physically moved and changes 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 of presentation preference and is considered administrative.

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. Therefore, 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. Therefore, this change does not involve a technical change, but is only a difference of presentation preference and is considered administrative.

ADMINISTRATIVE (continued)

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. Therefore, the requirements of CTS Table 4.2 Note 10 are physically moved and changes 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 of presentation preference 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. Therefore, the requirements of CTS Table 4.2 Notes 12 and 13 are physically moved to proposed Specifications 3.2.E and 4.2.E. The movement of the existing requirements is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS Table 3.2.1 Note 9 provide 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.

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, 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 Functions 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 rather than being placed in trip. This change represents an additional restriction on plant operation and is consistent with the ISTS (i.e., inoperable permissives are required to be restored to operable status rather than placed in trip).

TECHNICAL CHANGES - MORE RESTRICTIVE (continued)

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, rather than requiring the channel 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 perform the intended function (providing a time delay for actuation after certain conditions are satisfied) and could adversely impact the capability of 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 rather than being placed in trip. This change represents an additional restriction on plant operation and is consistent with the ISTS (i.e., inoperable time delays are required to be restored to operable status rather than placed in trip).

M.4 CTS Table 3.2.1 Note 13 provides actions for inoperable LPCI High Drywell Pressure (proposed Table 3.2.1 Trip Function 2.g) channels. These actions allow the inoperable channel to be tripped, rather than requiring the channel to be restored to operable status. The subject channels are associated with the containment spray permissive. As such, placing these LPCI High Drywell Pressure Trip Function channels in trip (as allowed by Note 12.B) does not perform the intended function (providing a containment spray permissive for actuation after certain conditions are satisfied) and could adversely impact the capability of safety systems to perform their intended functions. Therefore, the actions for inoperable channels of this LPCI High Drywell Pressure Trip Function are revised, in proposed Table 3.2.1 Action Note 3, to require that they be restored to operable status rather than being placed in trip. This change represents an additional restriction on plant operation and is consistent with the ISTS (i.e., inoperable permissives are required to be restored to operable status rather than placed in trip).

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.

TECHNICAL CHANGES - MORE RESTRICTIVE (continued)

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 (4) 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.

TECHNICAL CHANGES - LESS RESTRICTIVE

"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,

TECHNICAL CHANGES - LESS RESTRICTIVE

LA.2 (continued) 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.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Specific"

L.1 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. 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) Modes. In other Modes or conditions, the High Drywell Pressure initiation of the ECCS is not assumed since the primary containment is not required to be operable. In these other Modes or conditions, other Core Spray and LPCI Trip Functions are required to be operable to generate an ECCS initiation signal if required. As such, proposed Table 3.2.1 Trip Functions 1.a, 2.b, and 2.g are not required in Modes other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). This change is consistent with the ISTS.

L.2 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. 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., 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.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.3 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. 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. In this condition, the LPCI subsystems remain capable of performing their intended safety function. Therefore, the change is considered acceptable. This change is consistent with the ISTS.

L.4 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. 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) Modes. In other Modes or conditions, the specific initiation time of the ECCS is not assumed and the Trip Function only serves as a backup to administrative controls to ensure operators do not divert LPCI flow during a LOCA. In addition, in these other Modes or conditions, the modes of the RHR System (drywell and suppression pool spray) that utilize this Trip Function are not required to be operable since primary containment is not required to be operable. As such, proposed Table 3.2.1 Trip Function 2.d is not required in Modes other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). This change is consistent with the ISTS.

L.5 CTS Table 3.2.1 includes requirements for Trip System Logics associated with the ECCS instrumentation Trip Functions. These Trip Systems 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. These 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. 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., 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. This change is consistent with the ISTS.

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).

RELOCATED SPECIFICATIONS (continued)

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).

No Significant Hazards Consideration

3.2.A and 4.2.A

Emergency Core Cooling System

GENERIC NO SIGNIFICANT HAZARDS CONSIDERATION

ADMINISTRATIVE CHANGES
("A.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change involves reformatting, renumbering, and rewording. The reformatting, renumbering, and rewording process involves no technical changes to the existing Technical Specifications. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in methods governing normal plant operation. The proposed change will not impose any new or eliminate any old requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change will not reduce a margin of safety because it has no impact on any safety analyses assumptions. This change is administrative in nature. Therefore, the change does not involve a significant reduction in a margin of safety.

GENERIC NO SIGNIFICANT HAZARDS CONSIDERATION

RELOCATED SPECIFICATIONS
("R.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change relocates requirements and surveillances for structures, systems, components or variables that do not meet the criteria for inclusion in Technical Specifications as identified in 10 CFR 50.36 (c)(2)(ii). The affected structures, systems, components or variables are not assumed to be initiators of analyzed events and are not assumed to mitigate accident or transient events. The requirements and surveillances for these affected structures, systems, components or variables will be relocated from the Technical Specifications to an appropriate administratively controlled document which will be maintained pursuant to 10 CFR 50.59. In addition, the affected structures, systems, components or variables are addressed in existing surveillance procedures which are also controlled by 10 CFR 50.59 and subject to the change control provisions imposed by plant administrative procedures, which endorse applicable regulations and standards. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change will not impose or eliminate any requirements and adequate control of existing requirements will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the relocated requirements and surveillances for the affected structure, system, component or variable remain the same as the existing Technical Specifications. Since any future changes to these requirements or the surveillance procedures will be evaluated per the requirements of 10 CFR 50.59, no significant reduction in a margin of safety will be permitted.

   The existing requirement for NRC review and approval of revisions, in accordance with 10 CFR 50.92, to these details proposed for relocation does not have a specific margin of safety upon which to evaluate. However, since the proposed change is consistent with the BWR Standard Technical Specification, NUREG-1433 approved by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail ensures no significant reduction in the margin of safety.

TECHNICAL CHANGES - MORE RESTRICTIVE
("M.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change provides more stringent requirements for operation of the facility. These more stringent requirements do not result in operation that will increase the probability of initiating an analyzed event and do not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements continue to ensure process variables, structures, systems, and components are maintained consistent with the safety analyses and licensing basis. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in the methods governing normal plant operation. The proposed change does impose different requirements. However, these changes are consistent with the assumptions in the safety analyses and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The imposition of more restrictive requirements either has no impact on or increases the margin of plant safety. As provided in the discussion of the change, each change in this category is by definition, providing additional restrictions to enhance plant safety. The change maintains requirements within the safety analyses and licensing basis. Therefore, this change does not involve a significant reduction in a margin of safety.

GENERIC NO SIGNIFICANT HAZARDS CONSIDERATION

"GENERIC" LESS RESTRICTIVE CHANGES:
RELOCATING DETAILS TO TECHNICAL SPECIFICATION BASES, UFSAR, PROCEDURES, OR OTHER PLANT CONTROLLED DOCUMENTS
("LA.x" Labeled Comments/Discussions)

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change relocates certain details from the Technical Specifications to the Bases, UFSAR, procedures, or other plant controlled documents. The Bases, UFSAR, procedures, and other plant controlled documents containing the relocated information will be maintained in accordance with 10 CFR 50.59. The UFSAR is subject to the change control provisions of 10 CFR 50.71(e), and the plant procedures and other plant controlled documents are subject to controls imposed by plant administrative procedures, which endorse applicable regulations and standards. Since any changes to the relocated details in the Bases, UFSAR, procedures, or other plant controlled documents will be evaluated per the requirements of 10 CFR 50.59, no significant increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change will not impose or eliminate any requirements, and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the details to be transposed from the Technical Specifications to the Bases, UFSAR, procedures, or other plant controlled documents are the same as the existing Technical Specifications. Since any future changes to these details in the Bases, UFSAR, procedures, or other plant controlled documents will be evaluated per the requirements of 10 CFR 50.59, no significant reduction in a margin of safety will be allowed. Based on 10 CFR 50.92, the existing requirement for NRC review and approval of revisions, to these details proposed for relocation, does not have a specific margin of safety upon which to evaluate. However, since the proposed change is consistent with the BWR Standard Technical Specifications, NUREG-1433, approved by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail ensures no significant reduction in the margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
TS 3.2.A/4.2.A – EMERGENCY CORE COOLING SYSTEM INSTRUMENTATION

L.1 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change will eliminate the Current Technical Specification 3.2.A Applicability requirements of the Core Spray and Low Pressure Coolant Injection High Drywell Pressure Trip Functions for Modes or conditions other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). These Emergency Core Cooling System (ECCS) instrumentation Trip Functions are not assumed to be initiators of any analyzed accident. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, these Trip Functions are not credited for mitigation of any accident or transient in Modes or conditions other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). As such, the consequences of an accident occurring with the proposed change are the same as the consequences of an accident occurring with current requirements. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change continues to ensure the affected instrumentation is capable of performing its function as assumed in the safety analyses. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change is acceptable because it does not impact the ability of the affected ECCS instrumentation to perform its intended function which is to support the ECCS in the performance of their safety functions. In addition, the change is consistent with the safety analysis since the High Drywell Pressure initiation of the ECCS is a not assumed to mitigate accidents or transient in Modes or conditions other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). Since the change has no effect on any safety analysis assumptions or initial conditions, the margins of safety continue to be maintained. Therefore, this proposed change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
TS 3.2.A/4.2.A – EMERGENCY CORE COOLING SYSTEM INSTRUMENTATION

L.2 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change will extend operation when one or more channels of the affected Emergency Core Cooling System (ECCS) Trip Function instrumentation are inoperable and a loss of function has not occurred. The affected ECCS instrumentation Trip Functions are not considered to be initiators of any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Continued operation with inoperable ECCS Trip Function instrumentation channels will continue to be limited in accordance with Technical Specifications. Since the capability to perform the safety function will still be maintained in the proposed condition, the consequences of an accident occurring during the time allowed by proposed change are the same as the consequences currently allowed. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that continued operation in the applicable condition is not allowed when an associated ECCS Trip Function instrumentation channel is not capable of performing its required safety function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change will extend operation when one or more channels of the affected ECCS Trip Function instrumentation are inoperable and a loss of function has not occurred. No change is being made in the manner in which systems relied upon in the safety analyses provide plant protection. The capability to perform the required safety function will still be maintained in the proposed condition. Plant safety margins continue to be maintained through the limitations established in the Technical Specifications. This change does not impact plant equipment design or operation, and there are no changes being made to safety limits or limiting safety system settings. The proposed change does not impact safety. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.3 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change will eliminate the requirement to declare associated systems inoperable within 1 hour of discovery of loss of Low Pressure Coolant Injection (LPCI) System initiation capability when LPCI Reactor Vessel Shroud Level Trip Function instrumentation channels are inoperable. This Emergency Core Cooling System (ECCS) Trip Function is not assumed to be an initiator of any analyzed accident. Therefore, this change does not significantly increase the probability of a previously analyzed accident. In the case of one or more inoperable LPCI Reactor Vessel Shroud Level Trip Function instrumentation channels, the LPCI subsystems remain capable of performing their intended safety function. As such, the consequences of an accident occurring with the proposed change are the same as the consequences of an accident occurring with current requirements. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that continued operation in the applicable condition is not allowed when an associated ECCS Trip Function is not capable of performing its required safety function. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change is acceptable because it does not impact the ability of the LPCI subsystems to perform their intended safety function. No change is being made in the manner in which systems relied upon in the safety analyses provide plant protection. Plant safety margins are unchanged and continue to be maintained through the limitations established in the Technical Specifications. This change does not impact plant equipment design or operation, and there are no changes being made to safety limits or limiting safety system settings. Therefore, this proposed change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
TS 3.2.A/4.2.A – EMERGENCY CORE COOLING SYSTEM INSTRUMENTATION

L.4 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change will eliminate the Current Technical Specification 3.2.A Applicability requirements of the Low Pressure Coolant Injection (LPCI) Reactor Vessel Shroud Level Trip Function for Modes or conditions other than Run, Startup/Hot Standby, Hot Shutdown and Refuel (with reactor coolant temperature > 212°F). This Emergency Core Cooling System (ECCS) Trip Function is not assumed to be an initiator of any analyzed accident. Therefore, this change does not significantly increase the probability of a previously analyzed accident. The consequences of an accident occurring with the proposed change are the same as the consequences of an accident occurring with current requirements since LPCI can still perform its safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures the affected instrumentation is required to be operable when it is necessary to perform its function. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change is acceptable because it does not impact the ability of the affected ECCS instrumentation to perform its intended function which is to support the ECCS in the performance of their safety functions. In addition, the change is consistent with the Applicability of the systems that utilize this Trip Function (i.e., drywell and suppression pool spray modes of the Residual Heat Removal System). Since the change has no effect on any safety analysis assumptions or initial conditions, the margins of safety continued to be maintained. Therefore, this proposed change does not involve a significant reduction in a margin of safety.

L.5 CHANGE

In accordance with the criteria set forth in 10 CFR 50.92, Vermont Yankee Nuclear Power Station has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change will relax the actions when one or more channels of Emergency Core Cooling System (ECCS) Trip Function instrumentation are inoperable due to inoperable Trip System Logic. The ECCS Trip Function instrumentation is not considered to be an initiator of any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Continued operation with inoperable ECCS Trip Function instrumentation channels will continue to be limited in accordance with Technical Specifications. Since the level of degradation allowed in the proposed actions is the same as the current actions, the consequences of an accident occurring during the time allowed by proposed change are the same as the consequences currently allowed. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that continued operation in the applicable condition is not allowed when an associated ECCS Trip Function instrumentation channel is not capable of performing its required safety function. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This change will relax actions when one or more channels of the affected ECCS Trip Function instrumentation are inoperable. No change is being made in the manner in which systems relied upon in the safety analyses provide plant protection. Plant safety margins continue to be maintained through the limitations established in the Technical Specifications. This change does not impact plant equipment design or operation, and there are no changes being made to safety limits or limiting safety system settings. The proposed change does not impact safety. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

References

3.2.A and 4.2.A

Emergency Core Cooling System

3.2.A/4.2.A REFERENCES
Emergency Core Cooling System

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.